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Standardized Bycatch Reporting Methodology (SBRM) 3-year Review Report - 2023

Reviewing SBRM years 2021, 2022, and 2023

US DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
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Reviewing SBRM years 2021, 2022, and 2023

Brant McAfee[1] (chair), Joshua Lee[1] (co-chair), William Barnhill[6], Connor Buckley[2], Sarah Cierpich[3], Jason Didden[4], Katie Drew[5], Kimberly Murray[1], Douglas Potts[6], Bridget St. Amand[1], Kristina Thorpe[1], Sara Turner[6], Susan Wigley[1]

[1]NOAA National Marine Fisheries Service, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543-1026
[2]New England Fishery Management Council, 50 Water Street, Mill 2, Newburyport, MA 01950
[3]ERT, Inc., 14401 Sweitzer Lane, Suite 300, Laurel, MD 20707 in support of Northeast Fisheries Science Center
[4]Mid-Atlantic Fishery Management Council, 800 North State Street, Suite 201, Dover, DE 19901-3910
[5]Atlantic States Marine Fisheries Commission,1050 N. Highland Street Suite 200 A-N, Arlington, VA 22201
[6]NOAA National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office, 55 Great Republic Drive, Gloucester, MA 01930-2276

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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 pre-dissemination reviews are on file at the NEFSC Editorial Office.

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LIST OF ACRONYMS AND ABBREVIATIONS

AA = access area
ABC = acceptable biological catch
ACL = annual catch limit
AMS = Allocation Management System
ASM = at-sea monitoring
ASMFC = Atlantic States Marine Fisheries Commission
CV = coefficient of variation
d/k = discard/kept
EPU = Ecological Production Unit
ESA= Endangered Species Act
FMAT = Fishery Management Action Team
FMO = Fisheries Monitoring Operations Branch
FMP = fishery management plan
FW = framework
GARFO = Greater Atlantic Regional Fisheries Office
GB = Georges Bank
GOM = Gulf of Maine
IFM = industry-funded monitoring
IFS = industry-funded scallop
ITS = incidental take statement
IVR = Interactive Voice Response
JEA = Joint Enforcement Agreements
MA = Mid-Atlantic
MAFMC = Mid-Atlantic Fishery Management Council
MMPA = Marine Mammal Protection Act
MSA= Magnuson-Stevens Act
NE = New England
NEFMC = New England Fishery Management Council
NEFOP = Northeast Fisheries Observer Program
NEFSC = Northeast Fisheries Science Center
NOAA = National Oceanic and Atmospheric Administration
NMFS = National Marine Fisheries Service
OB = observer
OFL = overfishing limit
PDT = Plan Development Team
PTNS = Pre-Trip Notification System
SBRM = Standardized Bycatch Reporting Methodology
SSC = Scientific and Statistical Committee
TED = turtle excluder device
TDD = turtle deflector dredges
US = United States
VMS = vessel monitoring system
VTR = Vessel Trip Report

LIST OF PREPARERS

This document was prepared by a technical team, referred to as a Plan Development Team by the New England Fishery Management Council (NEFMC) or a Fishery Management Action Team by the Mid-Atlantic Fishery Management Council (MAFMC). The team had representatives from the NEFMC, MAFMC, National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center (NEFSC), NMFS Greater Atlantic Regional Fisheries Office (GARFO), and Atlantic States Marine Fisheries Commission (ASMFC). Brant McAfee and Joshua Lee were the chair and co-chair of the team.

Brant McAfee, NEFSC (Chair)
Joshua Lee, NEFSC (Co-Chair)
William Barnhill, GARFO
Connor Buckley, NEFMC
Sarah Cierpich, ERT, Inc., in support of NEFSC
Jason Didden, MAFMC
Katie Drew, ASMFC
Kimberly Murray, NEFSC
Douglas Potts, GARFO
Bridget St.Amand, NEFSC
Kristina Thorpe, NEFSC
Sara Turner, GARFO
Susan Wigley, NEFSC

EXECUTIVE SUMMARY

The Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment to the fishery management plans (FMPs) of the Greater Atlantic Region was implemented in February 2008 to address the requirements of the Magnuson-Stevens Fishery Conservation and Management Act to include standardized bycatch reporting methodology in all FMPs of the New England Fishery Management Council (NEFMC) and Mid-Atlantic Fishery Management Council (MAFMC). In response to a remand by the United States Court of Appeals for the District of Columbia concerning observer coverage specified by the original SBRM, an Omnibus Amendment revised the SBRM in 2015.

The SBRM can be viewed as the combination of sampling design, data collection procedures, and analyses used to estimate bycatch and allocate observer coverage in multiple fisheries. The SBRM also provides a structured approach for evaluating the efficacy of the allocation of observer coverage (sea days) to multiple fisheries to monitor a large number of species under the 13 different NEFMC and MAFMC FMPs as well as species listed under the Endangered Species Act (ESA). The SBRM is not intended to be the definitive document on estimation methods, nor is it a compendium of discard rates and total discards. Instead, the SBRM is intended to support the application of multiple bycatch estimation methods that can be used in specific stock assessments. The SBRM provides a general structure for defining fisheries into homogeneous groups and allocating/re-allocating observer coverage based on prior information and the expected improvement in overall performance of the program. The general structure helps identify gaps in existing coverage, similarities among species groups that allow for realistic imputation, and the tradeoffs associated with coverage levels for different species. The SBRM allows for continuous improvement in sea day allocation as new information on the results of the previous year's data is obtained, and it requires an annual report on discards occurring in Greater Atlantic Region fisheries to be prepared by National Marine Fisheries Service (NMFS) and provided to the Councils. Annual discard reports have been completed every year since 2009. However, data gaps in 2021 and 2022 caused by the COVID-19 pandemic precluded the full statistical analysis for those years.

The SBRM also requires that every 3 years, the Regional Administrator of the Greater Atlantic Regional Fisheries Office (GARFO) and the Science and Research Director of the Northeast Fisheries Science Center (NEFSC) appoint appropriate staff to work with staff appointed by the executive directors of the Councils to obtain and review available data on discards and to prepare a report assessing the effectiveness of the SBRM. This report should include:

(1) a review of the recent levels of observer coverage in each applicable fishing mode;
(2) a review of recent observed encounters with each species in each fishery (or by gear type for turtles) and a summary of observed discards by weight;
(3) a review of the coefficient of variation (CV) of the discard information collected for each fishery;
(4) a review of recent estimates of the total amount of discards associated with each fishing mode (these estimates may differ from estimates generated and used in stock assessments, as different methods and stratification may be used in each case);
(5) an evaluation of the effectiveness of the SBRM at meeting the performance standard for each fishery;

(6) a description of the methods used to calculate the reported CVs and to determine observer coverage levels if the methods used are different from those described and evaluated in this amendment;
(7) an updated assessment of potential sources of bias in the sampling program and analyses of accuracy;
(8) an evaluation of the implications of the discard information collected under the SBRM if a fishery did not achieve the performance standard; and
(9) Council review for consistency with national guidance.

A complete comparison of SBRM years 2021-2023 was not possible for certain elements of this report that rely on information from the annual SBRM discard estimation, precision, and sample size analysis because it was not conducted in SBRM 2021 or SBRM 2022 due to data gaps produced by the COVID-19 pandemic.

From July 2019 through June 2022, the NEFSC's Fisheries Monitoring Operations Branch (FMO, formerly known as the Fisheries Sampling Branch) managed 4 observer programs: the Northeast Fisheries Observer Program (NEFOP), the Industry-Funded Scallop Program (IFS), the Atlantic Herring Industry-Funded Monitoring Program (IFM), and the At-Sea Monitoring Program (ASM) for New England groundfish. While the full SBRM statistical analysis was only performed in 2023, summaries of observer and industry activity were completed in the 2021, 2022, and 2023 SBRM annual analyses for fish/invertebrates, and used observer data from the NEFOP and IFS programs. A total of 70 unique fleets (which are a combination of region, gear type, mesh group, access area, and trip category) have been reported in the 3 annual SBRM analyses (SBRM 2021, SBRM 2022, and SBRM 2023). It is possible for a trip to be partitioned into multiple fleets if 2 or more gear types or mesh groups are used during a trip. The result of this partitioning may inflate the number of trips and sea days in each data set. The numbers of unique observed trips (and days) before applying the stratification and conditioning the data set for analysis were 2,273 (6,036) in SBRM 2021, 751 (3,028) in SBRM 2022, and 1,576 (4,561) in SBRM 2023. In terms of numbers of trips, the percentages of observed trips varied by fleet and ranged from 0.1% to 33.3%. Over all fleets, the percentage of observed trips ranged from 1.1% to 3.4% annually. The percentage of observed sea days were generally similar and ranged from 2.3% to 4.6%. The observer coverage is higher for sea days than for trips because of the longer mean trip length and relatively higher coverage rates in some fleets.

The majority of fleets have 5% or less observer coverage of trips, sea days, or landings. It should be noted that percent coverage is only one measure for monitoring and that precision of the discard estimates is the specified metric for monitoring adequacy within SBRM.

Observers recorded 295 unique species over the 3-year period from July 2019 through June 2022. The 14 SBRM species groups represent approximately 90% of the total weight of all species recorded by observers. Observers recorded a total of 11 loggerhead (*Caretta caretta*), 1 Kemp's ridley (*Lepidochelys kempii*), 3 leatherback (*Dermochelys coriacea*), 1 green (*Chelonia mydas*), and 2 unknown species of sea turtles from July 2019 through June 2022.

For fish and invertebrate species groups, a combined d/k ratio estimator was used to estimate total annual discards and precision where d = discard pounds of a given species and k = kept pounds of all species in the observer data. The Vessel Trip Report (VTR) landings of all species combined, corresponding to each fleet and SBRM year, were used to expand the discard rate to estimate total discard weight of each SBRM species/species group, fleet, and SBRM year. The number of trips and sea days needed to achieve a given precision level was based on the

variance of the total discard estimate for a species group. Sample size (trips and sea days) associated with the SBRM precision standard for discard estimates (30% CV) were derived. The sample size analysis was performed by using trips as the sampling unit and then converting the number of trips to sea days by multiplying by the weighted mean trip length, where the weighting factor was the quarterly number of VTR trips. Since some sources of error are not encompassed in the CV calculations (e.g., from subsampling of large catches or relying on the captain's estimate of a haul weight), the estimated CVs are somewhat better (i.e., lower) than the actual precision of estimates.

An importance filter is used to provide a standardized protocol to further refine the number of baseline sea days based on 2 criteria: (1) the importance of the discarded species relative to the total amount of discards by a fleet and (2) the total fishing mortality from discards. The baseline sea days were filtered with a 95% cut-point in the discard filter and a 98% cut-point for the total mortality from discards filter. To determine the number of sea days (referred to as "SBRM standard sea days" or "SBRM sea days needed") and trips needed to achieve a 30% CV for all species groups within a fleet, the maximum number of sea days for the 14 species groups was used. In the event that sea days for each species group within a fleet are filtered out, then the number of sea days for the fleet will be based on minimum pilot coverage (3 trips per quarter for each quarter that has industry activity) to maintain some monitoring coverage for that fleet.

Typically, the NEFSC pools data over a 5-year time series and across multiple fishing fleets within the same gear type to estimate turtle bycatch[1]. In the most recent sink gillnet and bottom otter trawl analyses, a stratified ratio estimator (the ratio of observed turtle bycatch per unit fishing effort) was multiplied by total fishing effort to estimate total bycatch. Estimates are typically stratified by region, season, and mesh size or depth. The CVs from these analyses are used to estimate the number of sea days needed in sink gillnet and bottom otter trawl (including scallop trawl) gears to achieve a 30% CV goal in future years, but only if turtles are not removed from the sea day allocation process with the rarity filter. The rarity filter is based on the probability of observing a given number of turtles given the most recent turtle bycatch estimate, the quantity of VTR trips which informed the bycatch estimate, and various levels of observer coverage. If sea days are estimated for turtles, the sea days remain in place each year until new bycatch estimates are published (currently, every 5 years).

For the 14 SBRM fish/invertebrate species groups in SBRM 2023, 10 of the 14 precision estimates (71%) were less than or equal to 30% CV. All 4 species groups (Atlantic herring [*Clupea harengus*], bluefish [*Pomatomus saltatrix*], surf clams/ocean quahog, and tilefish [*Lopholatilus chamaeleonticeps*]) with precision estimates greater than 30% CV were associated with fleets that were filtered out by the importance filter indicating that discards were a minor component of the total catch of these species groups. The 30% precision standard for estimates of loggerhead turtle fishery interactions was met in the Mid-Atlantic (MA) bottom otter trawl and scallop trawl gears (2014-2018 turtle reference period) used in SBRM 2021-2023 and the MA/Georges Bank (GB) sink gillnet gear (2012-2016 turtle reference period) used in SBRM 2021 and 2022. The 30% precision standard was not met for estimates of loggerhead turtle interactions in bottom otter trawl and scallop trawl gears on GB, MA/Gulf of Maine (GOM) sink gillnet gears (2017-2021 turtle reference period) used in SBRM 2023, nor was it met for any other non-loggerhead turtle species in gillnet or trawl gear.

[1] Throughout this document, turtle "bycatch" refers to any kind of interaction between the fishing gear and the turtle, as opposed to only those animals that are landed on the vessel and discarded.

The numbers of accomplished sea days were near to the funded days for numerous fleets, with the majority of agency-funded fleets meeting or exceeding their sea day targets in SBRM 2021 and 2022. For a few agency-funded fleets, there were substantial numbers of unaccomplished sea days, primarily in the MA extra large gillnet and MA twin otter trawl fleets in both SBRM 2021 and 2022, and in the MA small mesh otter trawl and MA large mesh gillnet fleets in SBRM 2021. Over all agency-funded fleets, there were approximately 81.9% and 100.8% accomplished sea days in SBRM 2021 and 2022. The unaccomplished sea days were carried over to the following year.

The SBRM discard estimation analysis uses a broad stratification (region, gear type, mesh size group, access area, and trip category) to encompass all federally managed species considered in the SBRM, and it also uses a combined ratio method (discard-to-kept of all species weight ratio). The discard estimates reported here may not necessarily correspond directly to the discard estimates derived for individual stock assessments because of the differences in stratification and data. It is expected, however, that estimates would be in the same order of magnitude. The SBRM discard estimates are not definitive estimates but are indicative of where discarding is occurring among commercial fleets. No survival ratios were applied to the discard estimates; SBRM does not account for the potential survival of organisms returned to the water.

The SBRM Fishery Management Action Team (FMAT)/Plan Development Team (PDT) endorses the refinements described within the 2021-2023 annual reports and supports the approach of applying refinements when needed and documenting the change in the annual reports. The refinements and their descriptions ensure transparency and improvement to the regional SBRM.

Observed trips generally occurred over the range of number of trips and the cumulative distribution of annual kept weight by a vessel group within a fleet and SBRM. Similarly, there was no evidence of strong, systematic bias in the mean trip length and mean kept weight of all species of observed and unobserved trips. The differences in mean trip duration ranged from -1.00 to 0.87 days. Of the 36 fleets examined, 28 fleets (78%) had differences in mean trip duration less than 0, indicating that observed trips were slightly longer in duration than unobserved trips. The differences in mean kept weight of all species ranged from -27,634 and 2,309 pounds. Of the 36 fleets examined, 24 fleets (67%) had differences in means less than 0, indicating the kept weight of all species was greater on observed trips than unobserved trips.

This report contains recommendations for continued incremental modifications to the SBRM and illustrates the utility of the approach for monitoring discards in federally managed fisheries and the real-world limitations of implementing an ideal system. Overall, the SBRM represents one of the most comprehensive programs for planning and executing observer monitoring coverage of federally managed fisheries.

BACKGROUND

The Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment to the fishery management plans (FMPs) of the Greater Atlantic Region (NEFMC et al. 2007; NMFS 2008) was implemented in February 2008 to address the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to include standardized bycatch reporting methodology in all FMPs of the New England Fishery Management Council (NEFMC) and Mid-Atlantic Fishery Management Council (MAFMC). In response to a remand by the United States Court of Appeals for the District of Columbia concerning observer coverage levels specified by the SBRM (NMFS 2011), an SBRM Omnibus Amendment was implemented in 2015 (NEFMC, et al. 2015).

The SBRM established in the 2015 amendment is composed of 7 elements:

(1) the methods by which data and information on discards are collected and obtained;
(2) the methods by which the data obtained through the mechanisms identified in element 1 are analyzed and used to determine the appropriate allocation of at-sea observers;
(3) a performance measure by which the effectiveness of the SBRM can be measured, tracked, and used to effectively allocate the appropriate number of observer sea days;
(4) a process to provide the Councils with periodic reports on discards occurring in fisheries they manage and on the effectiveness of the SBRM;
(5) a measure to enable the Councils to make changes to the SBRM through framework adjustments and/or annual specification packages rather than full FMP amendments;
(6) a description of sources of available funding for at-sea observers and a formulaic process for prioritizing at-sea observer coverage allocations to match available funding; and
(7) measures to implement consistent, cross-cutting observer service provider approval and certification procedures and to enable the Councils to implement either a requirement for industry-funded observers or an observer set-aside program through a framework adjustment rather than an FMP amendment.

The SBRM can be viewed as the combination of sampling design, data collection procedures, and analyses used to estimate bycatch and allocate observer coverage in multiple fisheries. The SBRM provides a structured approach for evaluating the efficacy of the allocation of observer coverage (sea days) to multiple fisheries in order to monitor a large number of species under both the 13 different FMPs and the Endangered Species Act (ESA). The SBRM is not intended to be the definitive document on the discard estimation methods, nor is it a compendium of discard rates and total discards (Wigley et al. 2007). Instead, the SBRM is intended to support the application of multiple bycatch estimation methods that can be used in specific stock assessments. The SBRM provides a general structure for defining fisheries into homogeneous groups and allocating observer coverage based on prior information and the expected improvement in overall performance of the program. The general structure helps identify gaps in existing coverage, similarities among species groups that allow for realistic imputation, and the tradeoffs

associated with coverage levels for different species. The SBRM allows for continuous improvement in sea day allocation as new information on the results of the previous year's data are obtained.

The amendment requires an annual report on discards occurring in Greater Atlantic Region fisheries to be prepared by National Marine Fisheries Service (NMFS) and provided to the Councils. Annual discard reports have been completed every year since 2009. However, data gaps in 2021 and 2022 caused by the COVID-19 pandemic precluded the full statistical analysis for those years. Observers were not deployed from March 20, 2020, to August 13, 2020, which created observer data gaps in 3 calendar quarters that spanned the reference quarters for SBRM 2021 and 2022. The SBRM annual reports for 2013 onward are available at the National Oceanic and Atmospheric Administration (NOAA) Fisheries' Annual Discard Reports website for the Northeast. Once a year, the Northeast Fisheries Science Center (NEFSC) presents a report on discards occurring in Greater Atlantic Region fisheries, as reported by at-sea fisheries observers, to the Councils. This annual discard report includes summaries of the trips observed and 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. The annual report contains more detailed information regarding the number of observer trips and sea days scheduled that were accomplished for each fishing mode and quarter; 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 group by fishing mode; and the relationship between sample size and precision for relevant fishing.

To use the most recent available data in a standard manner, the annual SBRM analyses for fish/invertebrate species use data collected during a 12-month period from July through June. Generally, observer data used in the annual analyses are audited and available 90 days after collection; hence, each complete 12-month July through June dataset is ready to be analyzed beginning in October. From October to January, annual analyses are performed; these include: (1) summarizing the observer data for the Annual Discard Report, (2) updating the sea day analysis to derive SBRM standard sea days (the sea days needed to achieve a 30% coefficient of variation [CV]), and (3) prioritizing sea days based on the available budget. The SBRM Annual Discard Report with Observer Sea Day Allocation documents are posted online and presented to the Councils. The NEFSC Fisheries Monitoring Operations Branch (FMO, formerly known as the Fisheries Sampling Branch) observer program budget funds a 12-month period from April through March. Table 1 provides the time frame of data used for the fish/invertebrate species analysis and the subsequent sea day schedule for the 2021, 2022, and 2023 SBRM.

For estimating turtle discards, data for a particular gear type are pooled over a 5-year period, and estimates are updated every 5 years. The time series for the most recent turtle bycatch estimates are outlined in Table 2.

The SBRM also requires that every 3 years, the Regional Administrator of the Greater Atlantic Regional Fisheries Office (GARFO) and the Science and Research Director of the NEFSC appoint appropriate staff to work with staff appointed by the executive directors of the Councils to obtain and review available data on discards and prepare a 3-year report (i.e., this report) assessing the effectiveness of the SBRM. The following 8 elements are specified in the SBRM Amendment:

(1) a review of the recent levels of observer coverage in each applicable fishing mode;

(2) a review of recent observed encounters with each species in each fishery (or by gear type for turtles) and a summary of observed discards by weight;
(3) a review of the CV of the discard information collected for each fishery;
(4) a review of recent estimates of the total amount of discards associated with each fishing mode (these estimates may differ from estimates generated and used in stock assessments, as different methods and stratification may be used in each case);
(5) an evaluation of the effectiveness of the SBRM at meeting the performance standard for each fishery;
(6) a description of the methods used to calculate the reported CVs and to determine observer coverage levels if the methods used are different from those described and evaluated in this amendment;
(7) an updated assessment of potential sources of bias in the sampling program and analyses of accuracy; and
(8) an evaluation of the implications of the discard information collected under the SBRM if a fishery did not achieve its performance standard.

The first 3-year review was conducted in 2011-2012 and summarized data from 2009-2011 (Wigley et al. 2011 [Part 1], 2012 [Part 2]). The 2012-2014 3-year review was not conducted because SBRM regulations were not in place for those years. Since then, 3-year reviews have been completed for 2015-2017 (Hogan et al. 2019) and 2018-2020 (Wigley et al. 2021).

Since the implementation of SBRM, several other management actions associated with monitoring have been implemented. Some of these actions have or are proposing to modify or expand existing industry funded monitoring programs, (e.g., Northeast Multispecies Framework [FW] 48, FW55, Amendment 23; Scallop Amendment 21; Industry-Funded Monitoring Omnibus Amendment), establish cost-sharing responsibilities for industry-funded monitoring, or otherwise adjust reporting and data collection that could improve our ability to meet the SBRM performance standard (Table 1).

INTRODUCTION

This document represents the entirety of the 2023 SBRM 3-year review report and reviews the annual information presented in the 2021, 2022, and 2023 SBRM years with regard to the recent levels of observer coverage and observed encounters with species. This report also summarizes estimates of total discards and their associated precision for SBRM species groups and the individual species comprising these groups, by fleet and SBRM year, and addresses the 8 elements specified in the SBRM Omnibus Amendment. A complete comparison of SBRM years 2021-2023 was not possible for certain elements of this report that rely on information from the annual SBRM discard estimation, precision, and sample size analysis because it was not conducted in SBRM 2021 and SBRM 2022 due to data gaps produced by the COVID-19 pandemic. Instances where complete comparisons were not possible are noted in the specific sections of this report. The review is composed of 9 sections, which cover the following topics:

- Observer Coverage
- Observed Encounters
- Discard Estimation, Precision, and Sample Size

- Discard Reasons
- Effectiveness of SBRM
- Refinements to SBRM Methods
- Potential Sources of Bias and Accuracy Analyses
- Implications for Management
- Recommendations and Conclusions

This review uses the stratification and methods described in the initial SBRM analysis (Wigley et al. 2007) with respect to fish and summarizes the data reported in SBRM annual reports for 2021, 2022, and 2023 (McAfee and Wigley 2023; NEFSC and GARFO 2021, 2022, 2023). These data were collected from July 2019 through June 2022 for 70 fleets and 14 species groups and for the individual species that comprise these groups (subsequently referred to as "species/species groups") to encompass all federal FMP-managed species in the Greater Atlantic Region. A list of fleet stratification abbreviations is given in Table 4, a list of fish/invertebrate species is given in Table 5, and a list of fleet name abbreviations and row numbers assigned to each unique fleet to facilitate referencing is given in Appendix Table 1. Summaries of turtle discards in the SBRM annual reports may have been derived from earlier years, depending on the gear type. It is important to note that the full SBRM statistical analysis could only be completed for 1 year (2023) of the 3-year SBRM review period. COVID-19 pandemic observer coverage disruptions precluded the full SBRM statistical analysis in 2021 and 2022. Observed and fleet effort summaries were provided for these years (NEFSC and GARFO 2021, 2022), but the fish/invertebrate sample size analysis could not be completed. Instead, the most recent sea day estimation statistical analysis from 2020 was used as the basis to assign sea days for 2021 and 2022.

For fish, we use the term "bycatch" interchangeably with "discard." In basic terms, bycatch is defined as living organisms that are captured by fishing gear and returned to the water (they may survive or die). This use is consistent with the definition provided in the MSA where the term "bycatch" means fish which are harvested in a fishery but which are not sold or kept for personal use and includes economic discards and regulatory discards. "Bycatch" as used by the MSA does not include fish released alive under a recreational catch-and-release fishery management program (NMFS 2008). We do not define "bycatch" as the capture and retention of non-target species, nor do we account for potential survival of organisms returned to the water (these issues are often addressed and accounted for in fishery management and assessments). We also do not base any of our analyses on the potential mortality associated with unobserved encounters with fishing gear. Our omission of these mortality sources does not confirm or deny their potential importance. Rather, it explicitly recognizes that such events cannot be observed even when an observer is present on a given trip. Other sources of information (e.g., tagging studies, net pen experiments) can be used to inform consideration of discard mortality in fishery management and assessments.

For turtles, we are using the term "bycatch" interchangeably with the ESA definition of "takes"[2]. Some model-based estimates of loggerhead bycatch include a portion of those considered to be "unobservable" once a gear modification (i.e., a turtle excluder device [TED] or scallop chain mat) is used to exclude turtles (Warden and Murray 2011). "Unobservable" takes are those in which animals escape from the gear or come into contact with the gear but are not captured and

[2] The ESA of 1973 defines takes as: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

brought to the surface where they can be observed. If a portion of these unobservable takes can be quantified (Warden and Murray 2011), they are included in our estimates of turtle bycatch.

From July 2019 through June 2022, the NEFSC's FMO managed 4 observer programs: the Northeast Fisheries Observer Program (NEFOP), the Industry-Funded Scallop Program (IFS), Atlantic herring Industry-Funded Monitoring Program (IFM), and the At-Sea Monitoring Program (ASM; NEFSC 2021a, 2021b). The SBRM annual analysis for fish/invertebrates uses data from the NEFOP and IFS programs. In the Data Sources section of each of the annual reports, there is a brief description of the observer data used (also see footnote 4 in McAfee and Wigley 2023). To acknowledge the distinction between these observer programs (including sampling protocols, goals, and objectives), this document utilizes the term "OB" to refer to the collection of observed trips used in the annual analyses (i.e., excludes ASM and IFM data)

1. OBSERVER COVERAGE

1.1 Methods

Using the July-June data from the 3 annual SBRM analyses, we calculate the percentage of observed coverage in 3 terms: trips, sea days, and landings. These are derived for each fleet and SBRM year by dividing the annual sum of the values for each metric in the OB data set by the annual sum of the values for each metric in the VTR data set. Total annual coverage is then derived for trips and sea days by summing the values for each metric over all fleets for each SBRM year and then dividing the OB total by the VTR total for each metric.

In this document, observer coverage for turtles is expressed in terms of trips, by gear type, and region over the 5 combined years used in the analysis. Normally for each turtle bycatch analysis, observer coverage is evaluated at a finer temporal and spatial scale with respect to commercial effort and reported in terms of the unit of effort used in the bycatch rate. In 2023, 45 additional sea days were tasked to monitor sea turtle interactions in U.S. Mid-Atlantic (MA) gillnet fisheries as part of the ESA Annual Determination process. The data collected on ESA trips does not include discarded finfish; therefore, these trips will be excluded from future SBRM fish analyses. These types of trips are referred to as limited gillnet trips and use the same methodology as days tasked under the Marine Mammal Protection Act (MMPA). The priority for observers on ESA and MMPA sea days is to monitor for interactions of protected species that may otherwise be unobservable (i.e., fall from the nets while hauling).

Annually, the spatial and temporal patterns of observer coverage within a fleet were evaluated. Rather than using the number of trips (a trip-based metric), the kept weight of all species reported in the VTR was used. The "kept weight with observer coverage" was derived as the kept weight of all species reported in the VTR summed by fleet, statistical area, and quarter, where at least 1 observed trip occurred in the fleet-quarter-statistical area cell and at least 3 observed trips[3] occurred in the fleet-quarter stratum. The "kept weight" was derived as the kept weight of all species reported in the VTR summed over all statistical areas and quarters within a fleet. The percentages of "kept weight with observer coverage" were calculated by dividing the "kept weight with observer coverage" by the "kept weight." These percentages were derived for the individual fleets, confidential fleets combined into "Confidential fleets," "Other minor fleets," and all fleets combined. Additionally, as a relative measure of fleet activity among all fleets, the percentage of

[3] The 3 trips for fleet-quarter correspond with a minimum threshold for allocating observer coverage.

"kept weight" was derived by dividing the "kept weight" by the sum of the "kept weight" across all fleets.

1.2 Results

The numbers of OB and VTR trips and sea days, by fleet and SBRM year, used in the annual SBRM analyses are presented in Table 6 and Table 7, respectively. A total of 70 unique fleets (categorized by region, gear type, mesh group, access area, and trip category combinations) have been reported in the 3 annual SBRM analyses. It is possible for a trip to be partitioned into multiple fleets if 2 or more gear types or mesh groups are used during a trip. The result of this partitioning may inflate the number of trips and sea days in each data set. Both VTR and OB data are subject to trip partitioning, which typically affects a relatively few number of trips. Before applying the stratification and conditioning the data set for analysis, the numbers of unique OB trips (and days) were 2,273 (6,036), 751 (3,028), and 1,576 (4,561) in SBRM 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data), respectively.

In terms of numbers of trips, the percentages of observed trips varied by fleet and ranged from 0.1% to 33.3% (Table 6). Over all fleets, the percentage of observed trips ranged from 1.1% to 3.4% between the years in the review period. The percentage of observed sea days were generally similar and ranged from 2.3% to 4.6% during the years in the review period (Tables 6 and 7). The observer coverage is higher for sea days than for trips because of higher coverage in some fleets with longer trip durations.

Observer coverage rates, in terms of percentage of observed trips, sea days, and landings, are given in Figures 1-3, respectively, by fleet for 31 selected fleets and SBRM year (fleet abbreviations are given in Appendix Table 1). The 31 selected fleets are: Rows 1-8, 11, 19, 29-31, 33, 34, 37, 39-44, 48, 53, 55, 56, 58, 59, 61, 69, and 70; these represent fleets for which discards were estimated in at least 2 of the 3 years. In terms of trips, the observer coverage was highest in the fleets associated with the New England (NE) small mesh midwater trawl fleet (Row 48), the NE crab pot fleet (Row 61), and the MA small mesh twin otter trawl fleet (Row 11; Figure 1). The majority of fleets have less than 5% coverage of trips, sea days, or landings (Figures 1-3). It should be noted that percent coverage is only one measure for monitoring and that precision of the discard estimates is the specified metric for monitoring adequacy within SBRM.

Pilot fleet designation generally indicates little or no observer coverage available for the SBRM sample size analyses for the upcoming year. An exception to this occurs in cases in which OB trips were not temporally distributed throughout the year. Not all fleets considered within the SBRM have OB coverage. There were 32 fleets which required pilot coverage in all years, 23 fleets for which a change between pilot and nonpilot coverage occurred during the 3 years, and 15 fleets that had sufficient OB coverage in all years (Table 6). Since the full SBRM statistical analysis was not performed in 2021 and 2022, the fleets from the 2020 SBRM analysis were used as the basis for allocating sea days in those years, which results in 4 additional 2020 pilot fleets: MA Access Area (AA) small mesh scallop otter trawl (2020 Row 9), NE open general category large mesh scallop otter trawl (2020 Row 12), MA Danish seine (2020 Row 44), and NE urchin dredge (2020 Row 60).

Within the 3 SBRM years, there were 10 IFS fleets and 22 fleets were classified as confidential fleets in at least 1 of 3 years. The 10 IFS fleets were:

- Row 9 MA access area general category large mesh scallop trawl;

- Row 10 MA open general category large mesh scallop trawl;
- Row 37 MA access area general category scallop dredge;
- Row 38 NE access area general category scallop dredge;
- Row 39 MA access area limited category scallop dredge;
- Row 40 NE access area limited category scallop dredge;
- Row 41 MA open general category scallop dredge;
- Row 42 NE open general category scallop dredge;
- Row 43 MA open limited category scallop dredge; and
- Row 44 NE open limited category scallop dredge.

There were between 8 and 14 fleets where confidentiality rules applied in each of the SBRM years; the fleets were:

- SBRM 2021, Rows 13, 14, 16, 22, 27, 49, 57, and 67;
- SBRM 2022, Rows 12, 13, 14, 15, 16, 18, 22, 23, 46, 49, 50, 51, 57, and 68; and
- SBRM 2023, Rows 14, 15, 27, 45, 47, 51, 54, 63, 64, 65, and 68.

In terms of spatial and temporal patterns, the percentage of kept weight of all species with observer coverage (defined as the percentage of kept weight of all species reported in the VTR summed by fleet, statistical area, and quarter, where at least 1 observed trip occurred in the fleet-quarter-statistical area cell and at least 3 observed trips occurred in the fleet-quarter stratum) over all fleets was 56%, 50%, and 68% in SBRM 2021, 2022, and 2023, respectively (see Table 4 in NEFSC and GARFO 2021, 2022; McAfee and Wigley 2023). For each fleet reported annually, the percentage of kept weight of all species and the percentage of kept weight of all species observed are shown in Figure 4. The percentage of kept weight of all species observed was lower in 2021 and 2022 (potentially due to COVID-19 impacts on observer deployments) but rebounded in 2023 back to levels seen in the previous 2018-2020 SBRM years that ranged from 66% to 75% (Wigley et al. 2021). The annual percentages of kept weight of all species vary among fleets but do not exceed 20%, and the majority of the fleets had percentages of kept weight of all species observed that exceeded 25% (Figure 4). For nonpilot fleets, the average percentage of observer coverage was 72%, 44%, and 66% in SBRM 2021, 2022, and 2023, respectively (NEFSC and GARFO 2021, 2022; McAfee and Wigley 2023). Despite being somewhat lower than 2018-2020, these findings indicate that the majority of kept weight within the fleet was associated with statistical areas and quarters with observer coverage. The kept weight of all species can be considered a surrogate for fishing effort; hence, observer coverage occurred spatially and temporally where the majority of fishing effort occurred at the statistical area and quarter year scales.

Observed trips used for turtle bycatch analyses comprised either 10% or 11% of VTR trips depending on the gear type and time series (Table 8). Coverage rates were higher or lower when evaluated at finer temporal/spatial scales (Murray 2023).

Previously Reported Information

Numbers of OB and VTR trips and sea days, by fleet and calendar quarter, and percentages of kept weight of all species are available in Tables 2-4 of the annual document on discard estimation, precision, and sample size analyses for 14 federally managed species groups in the waters off the northeastern U.S. for SBRM 2023 (McAfee and Wigley 2023) and the annual discard report with observer sea day allocation for SBRM 2021 and 2022 (NEFSC and GARFO 2021, 2022).

1.3 Discussion

Percentage of observed coverage (in terms of trips, sea days, or landings) derived in this report should not be confused with the SBRM performance precision standard (30% CV of discard estimate for a given species group in each fleet), the specified metric used to allocate observer sea days among fleets and used to evaluate monitoring adequacy within the SBRM. For example, a given percent of trip coverage may or may not meet the SBRM discard precision standard in a given year for a particular species or species group. Observer monitoring of bycatch can have the objective of monitoring bycatch of individual species (fish and turtles) and/or broader quota monitoring limits in support of fisheries management. SBRM focuses on monitoring to achieve acceptable measures of discard estimation precision for specific species groups and fishing modes. Quota monitoring (including monitoring for compliance with regulations) is more challenging since increased coverage may be necessary to ensure more frequent in-season reports of discard rates. It must be emphasized that SBRM does not consider the additional monitoring requirements for compliance.

The analysis conducted for the spatial and temporal observer coverage used live weight. As a result, fleets using scallop dredge and clam dredge that target species with shells have higher kept weight percentage than other fleets because of the use of live weight rather than landed meat weight. However, the use of live weight does not distort the observed percentage (spatial or temporal pattern) within a fleet. Percent observer coverage is an indicator of where observed kept weight (or trips) occurred relative to unobserved kept weight (or trips).

The use of the previous year's data to estimate appropriate sampling coverage in a future year is predicated on the assumption that the discard variance remains constant (see Section 5 for variance stability), which has been a relatively reasonable assumption in most circumstances. The sufficiency of using the predicted number of sea days generated by using data from one previous year can change in response to a number of factors that include: variability in the discard estimates among the 15 SBRM species groups, changes in fishing patterns, changes in distribution and abundance of species groups, and regulatory changes. The SBRM process is designed to capture such changes by annually updating the sample size analysis. Since the sample size analysis was not updated in 2021 and 2022 due to COVID-19 impacts on observer deployments, the effects from these factors could be exacerbated by continuing to use the results of the 2020 sample size analysis for multiple years in the 2021 and 2022 sea day allocations, which could contribute to mismatches in predicted variances. However, using the 2020 analysis was deemed the most appropriate approach given the impacts from COVID-19.

2. OBSERVED ENCOUNTERS

2.1 Methods

The observer data used in this section describe encounters only, which consist of the actual observed values and are not extrapolated to the entire fleet for catch estimation (see sections below for catch estimates). Observed and unobserved hauls from observed trips using "limited" sampling or "complete" sampling protocols were included. Any observer data that required aggregation beyond the fleet level or data that could not be stratified to a fleet because of confidentiality rules, or missing gear or mesh information, are masked and aggregated into a single confidential fleet cell for reporting.

A list of all unique species recorded by observers over the 3-year period from July 2019 through June 2022 was compiled; species are recorded in pounds or in number, depending on the taxon. For all observed trips, observed catch quantities (kept and/or discarded) were summed for each species/species group, fleet, and SBRM year (Note: The fleet summaries excluded data that could not be classified to a fleet). Separate summaries are presented for fish/invertebrates (in live pounds) and sea turtles (in numbers).

The percentage of observed trips that encountered a species/species group is derived by dividing the number of observed trips that observed the given species/species group, regardless of catch disposition, by the number of observed trips in each fleet and SBRM year. The annual percentage of observed trips that encountered the species/species group was derived by summing the observed trips that encountered the species/species group over all fleets in each SBRM year and dividing by the sum of the number of observed trips in each SBRM year.

2.2 Results

Fish/Invertebrates

Observers recorded 295 unique[4] species (Appendix Table 2) over the 3-year period from July 2019 through June 2022. A summary of the 14 fish/invertebrate species groups, in weight by disposition, is given in Table 9 for the SBRM species groups, the SBRM species groups combined, the non-SBRM species, and all species combined by SBRM year. The 14 SBRM species groups represent approximately 90% of the total weight of all species recorded by observers (Table 9). As Table 9 reveals, no Atlantic salmon (*Salmo salar*) were encountered on observed trips during the time period examined; hence this species group is not reported in Table 10 or Figures 5-7.

Summaries of observed catch weight (kept and discarded) and the percentage of trips that encountered a species/species group by fleet and SBRM year are presented in Table 10 and Figures 5-7. In general, the percentage of trips encountering a species/species group varied across fleets; however, the percentages across SBRM years were similar (no distinct color patterns within a plot) and indicate persistent fleet/species group interactions. The skate complex (Rajidae), monkfish (*Lophius americanus)*, the fluke (*Paralichthys dentatus*)-scup (*Stenotomus chrysops*)-black sea bass (*Centropristis striata*) group, and sea scallops (*Placopecten magellanicus*) were the 4 most frequently encountered species/species groups on observed trips (Figures 5 and 6). Figure 7 reveals that for some species/species groups (e.g., skate, spiny dogfish [*Squalus acanthias*], Atlantic surfclam [*Spisula solidissima*]/ocean quahog [*Arctica islandica*], red deepsea crab [*Chaceon quinquedens*]) observed discards were a major component of observed catch in many fleets (symbols clustered along and near the identity line), and this pattern occurred over a wide range of catch sizes and was similar in all 3 years.

There were between 3 and 9 fleets in which confidentiality rules applied to observed catch in each of the SBRM years; the fleets were:

- SBRM 2021, Rows 12, 32, and 38;
- SBRM 2022, Rows 2, 4, 11, 31, 36, 53, 56, 58, and 61; and
- SBRM 2023, Rows 10, 11, 17, 19, and 46.

[4] Unique species reflect the species codes of living and non-living matter used by observers. Some species have not been identified to the species level, such as starfish, sponge, and sea cucumbers, and there are some cases when species cannot be positively identified and are recorded as a species group not known (e.g., “flounder, NK”).

Sea Turtles

Observers recorded a total of 11 loggerhead (*Caretta caretta*), 1 Kemp's ridley (*Lepidochelys kempii*), 3 leatherback (*Dermochelys coriacea*), 1 green (*Chelonia mydas*), and 2 unknown species of sea turtle from July 2019 through June 2022 (Tables 11-13). The number of turtles that were observed in older time periods that informed sea day coverage needs during the period of this review are listed in Table 14.

2.3 Discussion

This report section is a summary of the data collected on observed trips by trained at-sea observers. No discard estimation resulting from an expansion of discard ratios has been performed for observed encounters summarization. It is improper to calculate discard-to-kept ratios using this summary (Tables 9 and 10) because the data used to generate this summary include data from all hauls for which an observer was "on-watch," including hauls where discard data were not collected because of incidental take sampling and trips with "limited" sampling protocols. It is also improper to compare discard amounts across fleets without accounting for the number of observed trips by fleet; the number of observed trips will vary by fleet. This summary is not intended to replace analyses that subset observer data for discard estimation (see Section 3).

The percentages of trips that encounter species groups are informative. The percentage of trips encountering a species group provides a measure of the expected value of a trip toward reducing the variance of an estimate for a particular species or species group. As noted earlier, not all trips will be informative for all species. For example, an encounter rate of 25% for species A in fleet B would mean that only 1 of 4 trips in fleet B is likely to provide information on species A discards.

As endangered species are listed, they should be evaluated for inclusion to SBRM. For instance, Atlantic sturgeon (*Acipenser oxyrinchus*) was listed in 2012 and has been documented as bycatch (Appendix Table 2), yet it is not currently included in SBRM.

3. DISCARD ESTIMATION, PRECISION, AND SAMPLE SIZE

3.1 Methods

Fish/Invertebrates

From SBRM 2012 to SBRM 2020, the annual SBRM analyses have derived the discard estimates and their associated precision. However, observer data gaps due to the COVID-19 pandemic precluded the full SBRM statistical analysis in 2021 and 2022; specifically, the sample size and discard estimation procedures could not be conducted. SBRM 2023 was the only year in the 2021-2023 SBRM review years able to have discards and their associated precisions estimated along with conducting the sample size analysis[5]. Due to this constraint, only results from SBRM 2023 are provided. A detailed description of the data and methods used are given in McAfee and Wigley (2023). In brief, to estimate total annual discards and precision, a combined d/k ratio estimator (Cochran 1963) was used where d = discard pounds of a given species and k = kept pounds of all species in the observer data. The VTR landings of all species combined, corresponding to each fleet and SBRM year, were used to expand the discard rate to estimate total

[5] "Sample size analysis" is synonymous with "sea day analysis."

discard weight of each SBRM species/species group, fleet, and SBRM year. As such, the discard estimates only reflect discards from vessels where VTRs must be submitted.

The 2023 annual SBRM sample size analysis was conducted to estimate the number of baseline trips and sea days needed to monitor the 14 species groups in each fleet. As described in Wigley et al. (2007), the number of trips and sea days needed to achieve a given precision level was based on the variance of the total discard estimate for a species group. We calculated sample sizes (trips and sea days) associated with the SBRM precision standard for discard estimates (30% CV). The sample size analysis uses trips as the sampling unit and then converts the number of trips to sea days by multiplying by the weighted mean trip length, where the weighting factor was the quarterly number of VTR trips.

When total discards could not be estimated because of lack of data (little or no observer coverage), or when total discards were 0 (no variance), sample size was determined by using a pilot coverage level set to 2% of the quarterly VTR trips for a fleet, with a minimum of 3 trips per quarter (12 trips per year) and a maximum of 100 trips per quarter (400 trips per year). To avoid assigning more coverage than could be attained, if fewer than 3 VTR trips occurred in a fleet and quarter, then pilot coverage was set to 0. The quarterly trips were then multiplied by the quarterly mean VTR trip length to derive quarterly sea days. The quarterly trips and quarterly sea days were then summed for annual numbers of trips and sea days. Pilot coverage may result in more coverage than would actually be needed.

The current SBRM Omnibus Amendment calls for attainment of CVs of no more than 30% for each species group in every fleet (i.e., in each fleet/species group combination). Thus, for each fleet, a CV of 30% or less should be attained for each species group within that fleet. Some fleet/species group combinations contribute very little to the total mortality or discard of the species group but may require significant resources to characterize the precision of the estimate. For example, a high variance estimate for a rare event within a fleet would require high levels of sampling, even though the discard in that fleet was unimportant with respect to either the total discard or total mortality on the resource. To address these circumstances, importance filters are used to provide a standardized protocol to refine the number of baseline sea days based on: (a) the importance of the discarded species relative to the total amount of discards by a fleet and (b) the total fishing mortality from the discards. Two filters (i.e., fraction of discard filter and fraction of total mortality from discards filter[6]) were applied simultaneously. A detailed description of the SBRM importance filters is given in Wigley et al. (2007), and the 2012 refinement to the importance filter is given in Wigley et al. (2012).

The baseline sea days were filtered with a 95% cut-point in the discard filter and a 98% cut-point for the total mortality from discards filter. In other words, estimates of sea day coverage for a given species or species group were derived for those fleets where discards constituted 95% of the discard mortality and 98% of the total mortality. To determine the number of sea days (referred to as "SBRM standard sea days" or "SBRM needed sea days") and trips needed to achieve a 30% CV within a fleet, the maximum number of sea days for the 14 species groups (i.e., the maximum number of sea days in a row) was used. This approach ensures that all species groups (that have not been removed via the importance filter) within a fleet will have a 30% CV or less. In the event that sea days for each species group within a fleet are filtered out, then the number of sea days for the fleet will be based on minimum pilot coverage (3 trips per quarter for each quarter

[6] Fraction of total mortality from discards is defined as the ratio of discards of species group j in fleet h (D_{jh}) to the sum of commercial landings (L_{jh}), recreational landings (R_{jh}), and discards (D_{jh}) summed over h.

that has industry activity) to maintain monitoring coverage for that fleet. If the fleet is designated as a pilot fleet, then pilot sea days are used.

Sea Turtles

Typically, the NEFSC pools data over a 5-year time series and across multiple fishing fleets within the same gear type to estimate turtle bycatch. The time series used for the most current estimates of turtle bycatch in the 2 main gear types in this report are presented in the Background section.

In the most recent sink gillnet analysis (Murray 2023), a stratified ratio estimator (the ratio of observed turtle bycatch per unit of fishing effort) was multiplied by total fishing effort to estimate total bycatch. Rates were stratified by region (Gulf of Maine [GOM], Georges Bank [GB], and northern and southern MA), season, and mesh size. In the most recent bottom otter and scallop trawl analysis (Murray 2020), a stratified ratio estimator was also used, and rates were stratified by region, season, and depth. Some estimates of loggerhead bycatch include a portion of those considered to be "unobservable" once a gear modification (i.e., a TED) is used to exclude turtles (Warden and Murray 2011).

Sea days are estimated for monitoring turtle interactions in a gear type depending on the encounter rate determined from the most recent bycatch analysis. Sea days are only estimated and allocated for monitoring a turtle species in a gear type if there is a >50% probability of observing 5 or more turtles over 800 trips in a year (Hogan et al. 2019). If this threshold is met, then the CVs from these analyses are used to estimate the number of sea days needed in sink gillnet and bottom otter trawl (including scallop trawl) gears to achieve a 30% precision goal in future years. These estimated sea days remain in place each year until new bycatch estimates are published (currently, every 5 years). For dredge gear, sea day projections had been derived from CVs around estimated loggerhead bycatch (Murray 2012); however, sea day needs for turtles on vessels using scallop dredge gear have not been estimated since 2015 because the utility of observers as a monitoring tool for turtles in the fishery appears to be decreasing (Murray 2015; NEFSC and GARFO 2017). 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[7] 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). Since 2015, observer coverage levels in the MA scallop dredge fleets have been driven by other species groups. This approach ensures that some level of coverage still exists to monitor the effectiveness of TDDs and chain mats in reducing observable interactions and helps monitor turtle interactions outside of gear-regulated times and areas.

The number of observed sea days needed to achieve a 30% CV around estimated loggerhead bycatch was derived from Rossman (2007):

$$n_{proj} = (CV_{obs} * \sqrt{n_{obs}}/CV_{proj})^2$$

[7] Throughout this document, turtle "bycatch" refers to any kind of interaction between the fishing gear and the turtle, as opposed to only those animals that are landed on the vessel and discarded.

where n_{proj}= the amount of projected effort (converted to sea days) required to achieve a given precision level; CV_{obs} = the precision levels around estimated bycatch as reported in Murray (2020; trawl), or Murray (2023; gillnet); n_{obs}= the observed effort as reported in the above publications; and CV_{proj} = the projected precision level to be achieved.

3.2 Results

Fish/Invertebrates

Annual VTR landings and estimated discards (live pounds) with associated precision are compiled from the 2023 SBRM annual fish/invertebrate analysis as follows: (1) for each of the 14 SBRM species groups over all fleets for each SBRM year (Table 15; Figures 8 and 9); and (2) for the 14 SBRM species groups combined by fleet for each SBRM year (Table 16; Figure 10). The skate complex had the highest (37%) percentage of discards of the 14 SBRM species groups and sea scallops had the second highest (24%) percentage of discards (Table 15; Figures 8 and 9). Each of the remaining SBRM species groups had discards that were 8% or less of the total annual discards. There were no estimated discards for Atlantic salmon (species not encountered during the time period examined). For the 14 SBRM species groups combined, discards varied by fleet. The NE large mesh otter trawl fleet (Row 8) had the highest percentage of discards among all fleets (20.3%; Table 16; Figure 10). The NE AA limited access scallop dredge fleet (Row 44) had the next highest percentage of discards among all fleets (19.8%). These results are very similar to the last SBRM 3-year review when both fleets also accounted for the top 2 fleets for discards.

The landings associated with the various minor fleets aggregated in "Other fleets" generally constituted 0.02% of the total landings across all fleets and fleets aggregated in "Confidential fleets" constituted 0.03% (Table 16) indicating that nearly all landings are accounted for in the 70 uniquely identified fleets.

The precision (CV) of the discard estimates for SBRM 2023 only are displayed in Figure 12 for each of the 14 SBRM species groups and in Figure 11 for the 31 selected fleets. The precision associated with the estimated discards of species groups in fleets for which discards were considered unimportant (i.e., the discards of species group and fleet combinations that constituted the lower 5% of the discard mortality and/or lower 2% of the total mortality and were filtered out via the importance filter process) was not used in the sample size analysis to determine the SBRM sea day standard, which serves as the basis for sea day allocation in the upcoming year. Only the precision of the discard estimates of the SBRM species groups that were used in the sample size analysis is shown in Figure 11. The discard precision estimates for 5 of the 14 SBRM species groups (bluefish [*Pomatomus saltatrix*], tilefish [*Lopholatilus chamaeleonticeps*], Atlantic herring [*Clupea harengus*], surf clams/ocean quahog, and Atlantic salmon) were not used in the sample size analysis because they were filtered out by the importance filters or their discards were 0; thus, these species groups are not presented in Figure 12. The precision (CV) of the discard estimates for 14 SBRM species groups that were considered important varied by species group, fleet, and SBRM year. The majority of species groups/fleet combinations used in the sample size analysis had 30% CV or less (Figure 11).

For the 14 SBRM species groups in SBRM 2023, 10 of the 14 precision estimates (71%) were less than or equal to 30% CV (Figure 15). All 4 species groups (Atlantic herring, bluefish, surf clams/ocean quahog, and tilefish) with precision estimates greater than 30% CV were associated with fleets that were filtered out by the importance filter indicating that discards were a minor component of the total catch of these species groups. For the precision estimates of the

individual species that composed the 14 SBRM species groups in the SBRM 2023, see McAfee and Wigley (2023).

With regard to precision of the discard estimates, many of the species groups in the IFS fleets have CVs below 30% (Figure 11). The number of observer sea days in IFS fleets is based on the fraction of landed value allocated to discard monitoring and the daily compensation rate. The compensation rate[8] is designed to avoid biases that might arise if vessels avoided observers at low compensation rates or changed their fishing behavior at high compensation rates. Sea days from realized coverage rates generally exceed the SBRM standard sea days.

The SBRM sea day standard (numbers of sea days needed to achieve a 30% CV for all SBRM species groups within a fleet) and the prioritized funded sea days by fleet and SBRM year are given in Table 17. The sea day standard did not vary much for SBRM 2021 and 2022 other than the addition of several new fleets in SBRM 2022 that received pilot coverage because the same SBRM 2020 statistical analysis was used for the 2021 and 2022 SBRM years' sea day allocation. Greater change in the SBRM sea day standard occurred in SBRM 2023 when the full statistical analysis was conducted, which updated the number of sea days needed to achieve a 30% CV for all SBRM species groups within a fleet. The SBRM sea day standard varies from year to year for a given fleet because of the variability in discard estimates among the 14 SBRM species groups, changes in fishing patterns, and changes in both the distribution and abundance of the species groups. The use of the previous year's data to estimate appropriate sampling coverage in a future year is predicated upon the assumption that the discard variance remains constant (see Section 5 for variance stability).

In all 3 SBRM years, there were fleets with sea days needed but they had either practical limitations that prevented the observer program from covering them or they were determined to be erroneous based on a thorough review of VTR data. Fleets with practical limitations were listed as such because the observer program has no sampling protocols for them and would need to spend significant time to develop database changes, manual updates, new gear codes, logs, and observer trainings. Additionally, temporary fleets like the 2023 pilot Maximized Retention Electronic Monitoring (MREM) Program (NE small mesh haddock separator trawl [Row 20])—which were known to be solely composed of vessels using an Exempted Fishing Permit (EFP) to use non-regulation gear and therefore ineligible for SBRM coverage—were considered inapplicable.

The erroneous fleets and those with practical limitations varied by SBRM year as effort in the fisheries changed. Of the 70 unique fleets, there were 22 fleets (Rows 14-18, 20-27, 45, 50, 51, 54, 62-64, 66, and 67) determined to be "erroneous[9]" or inapplicable prior to the annual sea day allocation process (NEFSC and GARFO 2021, 2022, 2023). Since the fleets defined in the 2020 statistical analysis were used in 2021 and 2022 sea day allocations, there were also 2 additional "erroneous" fleets (2020 Rows 9 and 44) that are not included in the 70 fleets used for this review. In this report, as in the annual reports, these fleets are included in the discard estimation and

[8] Considerations in the compensation rate analysis include: a compensation rate that does not induce bias in vessel selection, the cost of carrying an observer, landings per unit effort, and expected scallop prices. The IFS program allows the vessels an increase in landings to help defray the costs of carrying an observer. The sale of the additional scallops allocated to each boat supplied the funding for the at-sea costs of the observer coverage.

[9] "Erroneous" fleets result from either VTR misreporting the gear type used, fishing outside the regulations (using different gear than allowed), or inconsistent gear codes between data collection systems. The required observer sea days associated with these fleets were set to 0. This action assists with improving sea day accomplishments by removing fleets that would be impossible to deploy observers on and, therefore, those erroneous fleets would always show a deficiency in observer coverage achievements. This approach also allows the observer provider to focus on deploying observers on real fleets.

precision summaries and excluded from the sea day allocation summaries. There were 9 fleets (Rows 27, 28, 35, 57, 62, 65, 68, 66, and 2020 Row 60) with practical limitations that prevented the observer program from covering them, which resulted in 36, 140, and 63 sea days in SBRM 2021, 2022, and 2023, respectively, that were reallocated to other fleets according to the prioritization process. Practical limitation fleets accounted for less than 2% of the combined sea days needed to cover all fleets.

In all 3 SBRM years, there were funding shortfalls that triggered the formulaic SBRM prioritization process called "the penultimate approach." Using the penultimate approach, the sea days needed are reduced until the sea day shortfalls (needed sea days versus funding constraints) are removed. In SBRM 2021, sea days from 10 fleets were reduced to meet a 3,096 sea day shortfall; in SBRM 2022, sea days from 10 fleets were reduced to meet a 3,099 sea day shortfall; and in SBRM 2023, sea days from 5 fleets were reduced to meet a 1,920 sea day shortfall (Table 17, yellow shaded cells).

Table 17 also presents the accomplished sea days by SBRM year and fleet for 2021 and 2022. The observed sea days for SBRM 2023 (April 2023-March 2024) were in progress during the drafting of this report, therefore, comparisons of allocated vs. accomplished sea days were conducted for SBRM 2021 and 2022 only. The numbers of accomplished sea days were near to the funded days for numerous fleets, with the majority of agency-funded fleets meeting or exceeding their sea day targets in 2021 and 2022. For a few agency-funded fleets, there were substantial numbers of unaccomplished sea days, primarily in the MA extra large gillnet (Row 31) and MA twin otter trawl (Row 11) fleets in both 2021 and 2022, and in the MA small mesh otter trawl (Row 5) and MA large mesh gillnet (Row 30) fleets in SBRM 2021 (Table 17). Over all agency-funded fleets, there were approximately 81.9% and 100.8% accomplished sea days in SBRM 2021 and 2022. In SBRM 2021 the allocated agency-funded fleet sea days were not met (-589 days) while they were met for IFS fleets (23 days). Conversely, in SBRM 2022, the allocated agency-funded fleet sea days were met (28 days), while they were not met for IFS fleets (-32 days). The goal of the IFS program is to obtain the target IFS coverage levels while still achieving the minimum SBRM sea days allocated. The IFS program assigns coverage based on a predetermined coverage rate by area for vessels intending to fish during the vessel notification process. Through the scallop FMP, specifications vary from year to year in regard to the number of access area trips and open area days, so the number of IFS days projected can be underachieved if total scallop industry activity (days and trips) is less than assumed at the time of the scallop compensation rate analysis.

Because of the COVID-19 pandemic, blanket observer waivers were issued from March 20, 2020, through August 13, 2020, and vessel-specific, situational waivers were issued from August 14, 2020, through June 17, 2021, which impacted sea day accomplishments for SBRM 2021 and 2022.

Sea Turtles

Total estimated bycatch of turtles and associated CVs by gear type are summarized in Table 18, and sea days needed to achieve a 30% CV are summarized in Table 19. Sea days were only estimated for loggerhead turtles (2014-2018 turtle reference period) in MA trawl gear that were used in SBRM 2021-2023 because encounter rates on GB and with other species (i.e., Kemp's ridley, leatherback, green) were too low (there was <50% probability of observing 5 or more turtles over 800 trips in a year). Sea days were estimated for loggerhead turtles only in MA/GB sink gillnet fleets (2012-2016 turtle reference period) that were used in SBRM 2021 and 2022. Sea days were not estimated for any turtle species in sink gillnets (2017-2021 turtle reference period) that

were used in SBRM 2023 because encounter rates were too low. Further details are provided in the associated references.

Previously Reported Information

Discard estimates, their associated precision, and the sample sizes needed in the upcoming year are available in Tables 5A (species group) and 5B (individual species) by fleet in the 2023 discard estimation, precision, and sample size analyses for 14 federally managed species groups in the waters off the northeastern U.S. annual document (McAfee and Wigley 2023). Sample sizes needed for all 15 species groups are given in the annual discard report with observer sea day allocations (NEFSC and GARFO 2021, 2022, 2023).

3.3 Discussion

Fish/Invertebrates

The lack of a full statistical analysis in SBRM 2021 and 2022 is limiting in this review because the discard, precision and sample size analysis was only performed in SBRM 2023. However, the same general methods were able to be used in the SBRM 2023 discard estimation analysis as were used in previous SBRM analyses. A broad stratification (region, gear type, mesh group, access area, and trip category) was employed to encompass all federally managed species considered in the SBRM, and a combined ratio method (discard-to-kept of all species weight ratio) was used to estimate discards. The discard estimates reported here may not necessarily correspond directly with the discard estimates derived for individual stock assessments because of differences in stratification and data used and peer-reviewed in assessments. It was expected, however, that estimates would be similar. Discard estimation differences are expected to improve in the future as SBRM transitions to using the Catch Accounting and Monitoring System[10] (CAMS), which is a new regional data system focused on supporting catch estimation for stock assessments, quota monitoring, and other programs by providing a common source of information. SBRM discard estimates are not definitive estimates but are indicative of how discarding occurs among federal commercial fleets. The following additional caveats apply to SBRM estimates:

- Region, based on port land, was used for deploying observers, and it was recognized that area fished would provide a better stratification for discard estimation. For further details on region vs. area fished, see footnote 6 in McAfee and Wigley (2023).
- The SBRM analysis used the VTR data. Dealer (CFDERS) data may be more complete in terms of landings, however the VTR data is a better source of trip, gear, and area information.
    - There can be differences in species pounds between the VTR and Dealer data sets: VTR reports are good-faith hail weights while Dealer data provides landings weights measured by dealers.
- Some imputation was needed because of limited temporal observer coverage of some fleets. It was recognized that half-year imputed estimates may not be appropriate for all species and that in some cells, quarterly discard ratios were based

[10] For more information about Catch Accounting and Monitoring System, see: https://www.fisheries.noaa.gov/event/catch-accounting-and-monitoring-system-peer-review

on small sample sizes. This approach contributed to lower precision (higher variability) of the discard estimates.

- Because of data limitations, discards were not estimated for all fleets, thus total discards were underestimated.
- "Erroneous" fleets stemming from misreporting or insufficient auditing also contributed to uncertainty in the discard estimates. The SBRM analyses use audited data and are predicated on accurate reporting. Expanded audits (focusing on stratification data elements such as gear and mesh) coupled with targeted outreach and education on the importance of accurate reporting may reduce or eliminate "erroneous" fleets and improve the assignment of trips to fleets.
- No survival ratios were applied to the discard estimates; we do not account for potential survival of organisms returned to the water. When comparing discard estimates from this study with those from stock assessments and quota monitoring, it is useful to note that survival ratios are applied to both.
- Pilot coverage has been used when the bycatch ratio is 0, when variance of the bycatch ratio or when the variance of the composite total discards is 0. It is recognized that pilot coverage may result in too much coverage in cases where no observer coverage is needed for a cell.
- The use of the importance filter is a key feature to the SBRM in that it focuses the sampling to fleets where it is needed most and not wasted on small, imprecisely estimated discards.
- The SBRM sample size analyses do not address the coverage needed for individual sectors or multiple stock components of a species. The analytical basis for the allocation of future sea day coverage in the SBRM is a specified level of precision (i.e., 30% CV) for the specified species groups/fleet combinations and an expectation that the pattern of fishing activity in the upcoming year will be similar to the prior year used for analysis.

Because of the unaccomplished sea days, it is possible that the lower observer coverage could lead to fleet discard estimates with CVs that are higher than the SBRM precision standard for some species in some fleets; however, it does not mean that all species within a given fleet will not meet the precision standard, or that a particular species discard estimate may be imprecise at a coastal or other relevant stratification (see Section 5 for further discussion on this topic).

The unaccomplished sea days were carried over to the following year. Carryover days from the previous year have been steadily declining over the past 3 years, composing 25%, 21%, and 9% of the required days for agency-funded fleets in SBRM 2021, 2022, and 2023, respectively. The SBRM is designed to accommodate funding shortfalls via the prioritization process, thus there is no reliance on unaccomplished days as a means to fund the required days in the following year.

The NEFOP is tasked with achieving all sea days allocated by the SBRM analysis each year; however, reaching target coverage was challenging during recent years. During the 2021 and 2022 SBRM years, blanket COVID-19 observer coverage waivers were in place from March 20, 2020, through August 13, 2020. Furthermore, from August 14, 2020, through June 17, 2021, situational waivers were issued to vessels on an individual basis if the vessel's COVID-19 preventative protocols were more stringent than the observer provider's or there was an active case of COVID-19 reported. During this period of waivers, sea day accomplishments were significantly impacted. Many NEFOP observers exited the program during the pandemic, and the program was

not able to keep up with the demand for trainings necessary to produce certified NEFOP observers as well as observers certified in all the specialized gear types required by the SBRM. With a smaller cadre of certified NEFOP observers and strict COVID-19 safety precautions, including COVID-19 testing and travel restrictions, sea day accomplishments in some fleets suffered (mainly the specialized gear fleets).

Beginning in SBRM 2020 and lasting through SBRM 2021, FMO recommended coverage priorities by fleet for post-COVID-19 deployments. The priorities were as follows in order of highest priority to lowest: SBRM minimum pilot coverage, IFS minimum pilot coverage, SBRM sea days outside of minimum pilot coverage, IFS sea days outside of minimum pilot coverage, MMPA coverage, ASM coverage, and industry-funded monitoring in the Atlantic herring fishery. The priorities were recommended because minimum pilot coverage of the SBRM days was not being targeted or achieved by the provider during the redeployment, specifically in the specialized gear fleets. It's important to have at least minimum pilot coverage of each fleet in order to conduct the SBRM discard analysis. The prioritization of fleets lasted until the start of the SBRM 2022 when 100% of the SBRM minimum pilot coverage days were able to be accomplished. In SBRM 2022, there were no more COVID-19 waivers being issued and the NEFOP provider was once again held accountable for accomplishing at least 90% of the total SBRM tasked days.

Historically, vessels have been selected for NEFOP Sea Day Schedule trips via dock intercept or phone communication. During the redeployment of observer coverage after the pandemic, it was difficult to achieve coverage with these methods in most fleets. FMO approved the use of formal selection letters to inform permit holders that their vessels have been selected for observer coverage on an individual basis. FMO implemented standard protocols for sending, processing, and documenting selection. Additionally, FMO utilized vessel monitoring system (VMS) selections to assist the NEFOP provider in selecting difficult vessels. Three states in the Northeast (Massachusetts, Connecticut, and New York) partnered with the Office of Law Enforcement between 2020 and 2023 to collaborate on Joint Enforcement Agreements (JEA). The JEA officers helped with dockside outreach for the program and supported FMO and the provider in vessel selection in the states that participated.

In SBRM 2023, the sea day schedule was released several weeks later than previous years (after the start of the SBRM year [April 1]), which contributed to sea day accomplishment challenges. The delay did not allow for FMO to do any SBRM outreach with the industry regarding the updated sea day coverage requirements in a timely manner, which generated concern from some vessels carrying more observers than prior years without an explanation from NMFS on the changes in observer coverage. This was most pronounced in the MA small mesh otter trawl fleet, where sea days more than doubled from the previous 3 years due to updated information in the annual statistical analysis, which impacted the sea day prioritization process, and subsequent allocation of sea days for this fleet.

Concern has been voiced by some in the industry that observer coverage differences between the MA and NE regions may artificially redirect effort. Specifically, their concern is that higher MA coverage rates may create incentives to land in NE ports rather than historic MA home ports.

It is difficult to deploy observers on vessels at a coverage rate greater than 20% without a pre-trip notification system (PTNS) requirement, sometimes due to low industry tolerance of higher observer coverage. Coverage is not optional, but the absence of a PTNS requirement creates challenges in identifying eligible effort as well as in timely communication of trip selection and deployment logistics between provider staff and permit holders. Without a PTNS requirement,

there is higher burden on observers and providers to obtain trips, and they continue to have difficulty in the field with resistance from some segments of industry.

Providers also report difficulty maintaining the needed level of observers due to the large seasonal variations in the amount of sea days tasked throughout the course of the year, which leads to seasonality in the size of the full-time observer cadre needed to complete the allocated sea days. Furthermore, a lack of observers who possess the necessary certifications to cover certain fleets can lead to missed coverage. For certain fleets, a lack of observer provider staff and the resulting need to build new contacts and relationships can lead to lower coverage. Additionally, certain fleets or vessels within a fleet are not required to carry a VMS. This situation leads to increased challenges for provider staff in identifying and tracking effort, which is necessary for successful observer deployment.

Lack of fishing effort for certain fleets was identified as an obstacle to observer coverage, as well. Certain fleets had very low effort, or went through periods of low effort. While effort was low, there was enough effort to support the required sampling. The FMO works with the provider to shift days among months within a quarter to capture shifts in effort. Additionally, compliance with safety requirements was an obstacle to achieving coverage in several SBRM fleets. Observers and providers generally try to work with vessel owners to resolve safety issues whenever possible. Fleets that receive intermittent observer coverage often require more outreach by provider and observer program staff to bring vessels into safety compliance.

4. DISCARD REASONS FOR FISH AND INVERTEBRATES

4.1 Methods

As mentioned above, the MSA requires FMPs to include conservation and management measures that, to the extent practicable, minimize bycatch. Thus, it could be useful to know what portion of the discards is associated with regulatory measures. As described in the SBRM Omnibus Amendment (NEFMC et al. 2007; NEFMC et al. 2015), fish may be discarded for a variety of reasons including regulatory and economic reasons. It is important to note that the reasons behind the discards and the measures that could be used to reduce discards are not the focus of the SBRM.

For SBRM 2023 only, the fish dispositions associated with discarding (as reported by the at-sea observer) have been grouped into the following 6 discard reason categories: “No Market,” “Regulation (size),” “Regulation (quota),” “Regulation (other),” “Poor Quality,” and “Other.” The fish dispositions and the discard reason categories are summarized in Appendix Table 3. The discard reasons “No Market” and “Poor Quality” would be considered economic discards and not regulatory discards.

The observed (non-extrapolated) discards associated with each of 6 discard reason categories were summed for each species group, fleet, and SBRM year for the fleets where discards could be estimated. For individual fleets, the percentage of observed discards by discard reason category was derived by dividing the sum of the observed discards for each discard reason category by the sum of the total observed discards for each species group, fleet, and SBRM year. The extrapolated discard reason category percentages were the same as the observed discard reason category percentages. For the “Other fleets filtered out” (an aggregated fleet that represents fleets where the variance of the discard estimate was not used in the annual SBRM sample size analysis), the observed discard reason category percentages were then multiplied by the total estimated (extrapolated) discards for each species group, fleet, and SBRM year to derive the estimated

discards by discard reason category for each species group, fleet, and SBRM year for each of the fleets associated with the aggregated fleet. For each "Other fleets filtered out," the total estimated discards by discard reason category were summed over the fleets that comprise the fleet aggregation for each species group and SBRM year. The extrapolated discard reason category percentage was derived by dividing the estimated discards for each discard reason category by the sum of the total estimated discards for each species/species group, fleet, and SBRM year. For each "Other fleets filtered out," the extrapolated discard reason category percentages were the observed discard reason category percentages weighted by the estimated discards in each fleet.

Information from the SBRM 2023 annual discard report have been summarized in graphic form for this review report.

4.2 Results

In SBRM 2023, the majority (80%) of discards were attributed to "No Market" and 14% were attributed to "Regulation" (size, quota, and other), with "Poor Quality" and "Other" both accounting for 3% each. The reasons for discarding varied by species group (Figure 13).

Previously Reported Information

Annually, the discard reasons associated with the estimated discards are summarized by species group and fleet (see Appendix Tables 3A and 3B in McAfee and Wigley 2023).

4.3 Discussion

When considering mechanisms to reduce discards, it may be useful to know why discarding is occurring. Fish may be discarded for economic reasons (e.g., no market or poor quality) or for regulatory reasons (size, quota, or other). It is important to note that a large discard reason percentage may be associated with a small quantity of discards. Additionally, for many species, the discards are associated with fleets that have been filtered out by the importance filter.

The observer classifies the discards by fish disposition based upon NEFOP protocols (NEFSC 2021a, 2021b) where the observer asks the captain/crew why species are being discarded. Thus, these data should be considered similar to self-reported data and as such, these data are difficult to verify and should be interpreted carefully. Additionally, the NEFOP protocols for collecting discard reasons recognized that more than 1 discard reason could apply to a particular subset of discards. Information on discard reason is available within the NEFOP database to support further analysis.

5. EFFECTIVENESS OF SBRM

5.1 Methods

Fish/Invertebrates

Performance Standard

The SBRM performance standard is a 30% CV of the total discards (NEFMC et al. 2015). This performance standard applies to each unique fleet, species group, and SBRM year. In this section, each unique fleet, species group, and SBRM year is referred to as a "cell." Each cell in the 3 SBRM years was classified to 1 of the following 6 SBRM performance classifications:

- "Not Applicable" – SBRM performance was not applicable. The variance of the discard estimate was not available; fleets were not considered within the annual SBRM analysis, including fleets determined to be "erroneous" (Box 1; Figure 14).
- "Unknown" – SBRM performance was unknown. The variance of the discard estimate was not used because there was no observer coverage (Box 2; Figure 14) or insufficient observer coverage (Boxes 3 and 4; Figure 14). This SBRM performance classification is associated with pilot fleets only. Discards cannot be reliably estimated for cells with insufficient OB coverage. Designation of pilot coverage is described in Wigley et al. (2007).
- "Met" (filtered out) – SBRM performance was met because the discard CV was less than or equal to 30% (Boxes 5 and 7b; Figure 14), and the variance of discard was not used in the annual sample size analysis because of the importance filter (cell filtered out). This SBRM performance classification is associated with nonpilot fleets only.
- "Not Met" (filtered out) – SBRM performance was not met because the discard CV was greater than 30% (Box 7a; Figure 14) and the variance of discard was not used in the annual sample size analysis because of the importance filter (cell filtered out). This SBRM performance classification is associated with nonpilot fleets only.
- "Met" – SBRM performance was met because the discard CV was less than or equal to 30% (Box 9; Figure 14) and the variance of discard was used in the annual sample size analysis. This SBRM performance classification is associated with nonpilot fleets only.
- "Not Met" – SBRM performance was not met because the discard CV was greater than 30% CV (Box 8; Figure 14) and the variance of discard was used in the annual sample size analysis. This SBRM performance classification is associated with nonpilot fleets only.

Variance Stability

The SBRM uses the variance of discards from the previous year to determine the number of sea days needed in the next year. This approach assumes the variance of the discard estimates are stable such that the variances can be used from one year to inform the sample size needed in the following year. It assumes the persistence of fishing behavior over time. Analyses from previous SBRM review reports (Wigley et al. 2012; Hogan et al. 2019) support this assumption.

Only discard variances from SBRM 2023 could be evaluated in this review report because it was the only year that the full statistical analysis was performed; discard variances for SBRM 2021 and 2022 do not exist. Therefore, no assessment of variance stability over the last 3 SBRM years is conducted in this review report. Summaries of number of trips needed to achieve a 30% CV by species group, fleet, and SBRM year (taken from the Table 7 and Figure 3 in McAfee and Wigley 2023) and the relationship between CV and sample size (trips) are presented for the 18 fleets with sample sizes for species groups that were not filtered out.

5.2 Results

Fish/Invertebrates

Performance Standard

The 6 SBRM performance classifications ("Not Applicable," "Unknown," "Met [filtered out]," "Not Met [filtered out]," "Met," and "Not Met") and the characteristics of the cells associated with each performance classification are depicted in Figure 14. When considering fleets, there is a total of 980 for each SBRM year (70 fleets x 14 species groups). The number of cells by SBRM performance classification and SBRM year is presented in Table 20. The number of fleets by SBRM performance classification, species group, and SBRM year is presented in Table 21. The number of species groups by fleet are given in Table 22. The fleet, species groups, and associated CV for cells that did not meet the SBRM performance standard are listed in Table 23.

There are 336 cells that are "Not Applicable" and 168 cells and 12 fleets in 2023 (Tables 20 and 21) with "Unknown" performance classification across all species groups and fleets. The "Unknown" cells were associated with the pilot fleets (fleets with no or insufficient observer coverage in all years; Table 6) where all species groups within these fleets were "Unknown" (Tables 20 and 21).

Cells with the SBRM performance classification of "Met" (filtered out) and "Not Met" (filtered out)—Boxes 5, 7a, and 7b (Table 14), respectively—were also excluded from the set of cells used in the evaluation of effectiveness. The filtered out cells represent fleets and species groups where discards are considered a minor component of total catch and were not used in the annual sample size analyses to determine coverage for the subsequent year. The total number of cells removed because of the importance filter in SBRM 2023 were 429 (260+169; Tables 20 and 22).

In the evaluation of effectiveness, only the cells used in the annual sample size analysis (cells associated with Boxes 8 and 9; Figure 14) were considered. The number of SBRM 2023 cells considered in the evaluation are 47 (30+17; Table 20). The percentage of cells that met the SBRM performance standard in SBRM 2023 was 64% (30/47). The annual SBRM performance classifications for cells in the analysis were summarized by species group using the 6 categories (Table 21) and summarized by fleet using the following 3 categories: (1) "Not Met," (2) "Met," or (3) "Met" and "Not Met" that were filtered out (Table 22). There were 5 species groups (Atlantic herring, Atlantic salmon, bluefish, surfclam and ocean quahog, and tilefish) without any cells classified as "Met" or "Not Met" (Table 21). There were 3 species groups with no cells classified as "Not Met" (large mesh groundfish, red deepsea crab, and sea scallop) indicating the performance standard was met for all cells in the evaluation. The remaining species groups: fluke-scup-black sea bass, monkfish, skate complex, small mesh groundfish, spiny dogfish, and squid (*Doryteuthis [Amerigo] pealeii, Illex illecebrosus*)-butterfish (*Peprilus triacanthus*)-mackerel (*Scomber colias, Scomber scombrus*) had cells classified as "Not Met."

In SBRM 2023, pilot fleets represented 26% of the fleets (Table 6). For nonpilot fleets, there were 7 fleets for which all non-filtered species groups "met" the performance classification (Table 22), while Table 23 lists the cells, by SBRM year, species group, and fleet, where there were 17 species groups and fleet combinations that did not meet the performance standard. Consequences to management are discussed in Section 8.

Variance Stability

The variance stability could not be evaluated in this review report because discard variance information is only available for SBRM 2023. The number of trips needed to meet specific CV

levels for individual fleets and species groups in SBRM 2023 are shown in Figure 15, while the trips needed to meet a 30% CV and the driving species group that determines the specified number of SBRM standard trips is given in Table 24.

Previously Reported Information

Previously reported information on precision of discard estimates is available at a cell level by species group, fleet, and SBRM year in Tables 5A and 5B of McAfee and Wigley (2023); the relationships between precision (CV) and the sample size needed for species groups and fleets that were not filtered are given in Figure 3; and the sample sizes needed in Table 7 of McAfee and Wigley (2023).

Sea Turtles

Based on 5-year pooled datasets (see Table 2 for years included), the 30% precision standard for estimates of loggerhead fishery interactions used in SBRM 2021-2023 was met for MA bottom otter trawl and scallop trawl fleets (Murray 2020) and for estimates used in SBRM 2021 and 2022 for MA/GB sink gillnet fleets. The 30% precision standard was not met for estimates of loggerhead interactions used in SBRM 2021-2023 for bottom otter trawl and scallop trawl fleets on GB (Murray 2020), for estimates used in SBRM 2023 for sink gillnet fleets in the MA/GOM (Murray 2023), or for any other non-loggerhead species estimates used in SBRM 2021-2023 in gillnet or trawl gear (Table 18; Murray 2020, 2023).

5.3 Discussion

Fish/Invertebrates

Performance Standard

The percentages of fleet and species group combinations that met the SBRM performance standard in SBRM 2023 dropped since the last SBRM 3-year review, declining from an average of 86% (SBRM 2018-2020) to 64% in SBRM 2023. This decrease could potentially be due to the continuation of the SBRM 2020 fleet and sea day allocations in SBRM 2021 and 2022 during the hiatus in conducting the full SBRM statistical analysis because of COVID-19 pandemic-induced observer data gaps. Not updating SBRM fleet and standard sea days for 2 years may have made the SBRM less responsive to changes in fleet composition and discarding dynamics than it normally would have been if the full statistical analysis was done each year, which may have contributed to the decrease in the number of cells meeting the SBRM performance standard.

The SBRM is designed to allow for a feedback process to occur, such that if there is uncertainty about a discard estimate (not filtered out) of a given species group within a fleet, then more sea days are required to monitor the fleet. The effectiveness of the SBRM at meeting the performance standard is not only dependent upon the assumption of variance stability from one year to the next but on other factors including available funding. In all 3 years (SBRM 2021-2023) of this review report there was a funding shortfall that prevented the full allocation of SBRM standard sea days (those needed to achieve the performance standard) for some fleets (see Section 3 for more details). This funding shortfall impacts the data evaluated in subsequent SBRM analyses and potentially contributes to the performance standard not being met in subsequent SBRM years.

Variance Stability

The variance stability could not be evaluated in this review report because discard variance information is only available for SBRM 2023.

Sea Turtles

Observer coverage is typically allocated to monitor loggerhead turtles in the MA region because loggerheads are the most common sea turtle species observed and occur less frequently in the GB and GOM regions. Beginning in SBRM 2023, the study region used in the analysis to determine sea day needs for turtles in gillnet fleets expanded to include the GOM Ecological Production Unit (EPU) in addition to the GB and MA EPUs. In the updated gillnet analysis, the probability of observing 5 or more loggerhead turtles over 800 trips was below the 50% threshold required by the SBRM to allocate sea days based on turtles (Murray 2023). The same was true for the other turtle species (Kemp's ridley, green, and leatherback). Therefore, coverage for these species was not estimated nor allocated in SBRM 2023, and the sea days needed for turtles in MA and NE gillnet fleets was set to 0. Instead, the targeted level of monitoring in the gillnet fleets was driven by other marine species groups.

Due to the rarity of sea turtle bycatch events, data are pooled over a 5-year period for the estimation process. In a single year, very few turtles may be observed, so CVs derived around a bycatch rate may be very high and warrant enormous levels of coverage to estimate bycatch with 30% precision the subsequent year. If a turtle species is not filtered out in the sea day estimation process (see Hogan et al. 2019 for details), then the CVs from the pooled 5-year time series are used to estimate annual sea day coverage in subsequent years until a new bycatch estimate is completed. This approach means that coverage levels for the time period of 2020-2024, for example, will have been informed by conditions in the fishery from 2014-2018 (Murray 2020). Therefore, changes in the anticipated magnitude and distribution of fishing effort from one time series to the next could also offset the expected performance standard for turtles.

6. REFINEMENTS TO SBRM METHODS

6.1 Fish/Invertebrates

The methods used for the 2021, 2022, and 2023 SBRM are described in Wigley et al. (2007); McAfee and Wigley (2023); and NEFSC and GARFO (2021), (2022), (2023). No changes to the methods used for discard estimation and precision occurred during the 3 years in review. However, methodological refinements have been incorporated into the sample size analyses used for fish/invertebrate species groups in the 2021, 2022, and 2023 SBRM. These refinements are listed below by SBRM year.

2021:

- No updated discard and sample size analysis. Continue to use SBRM 2020 fleets and sea days needed. Observer coverage needs were updated with available 2021 funding (NEFSC and GARFO 2021).

2022:

- Added chub mackerel (*Scomber colias*) to squid-butterfish-mackerel species group in the 2022 SBRM Annual Discard Report with Observer Sea Day Allocation (NEFSC and GARFO 2022).

- Added rules for dealing with ties when applying the penultimate prioritization approach. 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 tie (NEFSC and GARFO 2022).
- Northern GOM Scallop Management Area scallop trips (effective April 2022) are considered access area ("AA") trips (NEFSC and GARFO 2022).
- No updated discard and sample size analysis. Continue to use SBRM 2020 fleets and sea days needed, however new SBRM 2022 fleets were added and assigned pilot coverage. Observer coverage needs were updated with available funding (NEFSC and GARFO 2022).

2023:

Relevant pending actions as of the drafting of this report:

- The Atlantic State Marine Fisheries Commission recommended that NMFS implement mandatory harvester electronic VTR requirements for all Federal lobster permit holders through Addendum XXVI to Amendment 3 to the Interstate Fishery Management Plan for American Lobster/Addendum III to the Interstate Fishery Management Plan for Jonah Crab. NMFS published an interim final rule[11] implementing mandatory harvester electronic VTR as of April 1, 2024, making vessels that only hold a federal lobster permit eligible for NEFOP observer coverage.
- Scallop fleet transition from the current Interactive Voice Response (IVR) system to PTNS[12] beginning April 1, 2024.

Sea Turtles

2021:

- No changes.

2022:

- No changes.

2023:

- Turtle sink gillnet analysis (Murray 2023):
    - Study region expanded to include GOM EPU.
    - All turtle species filtered out due to encounter rarity.

[11] For more information on interim final rule, see: https://www.federalregister.gov/documents/2023/10/02/2023-21466/fisheries-of-the-northeastern-united-states-atlantic-coastal-fisheries-cooperative-management-act

[12] For more information on IVR transition to PTNS, see: https://www.fisheries.noaa.gov/new-england-mid-atlantic/fisheries-observers/scallop-vessels-transition-pre-trip-notification

Combining Sea Days Needed for Fish/Invertebrates and Sea Turtles

The approach used to combine the sea days needed for fish/invertebrates and sea turtles is described in the annual allocation of observer sea days (NEFSC and GARFO 2021, 2022, 2023). No changes were made to the allocation process between SBRM 2021 and 2023.

The SBRM Fishery Management Action Team (FMAT)/Plan Development Team (PDT) recommends continued use of these refinements described above for fish/invertebrates, sea turtles, and combining sea days needed. The SBRM FMAT/PDT agrees with the status quo approach of making and documenting annual refinements (as needed) and subsequently reviewing and summarizing these refinements in the SBRM 3-year review report.

The SBRM FMAT/PDT recommends the following planned changes for future SBRM analyses:

- Consideration of ESA list species such as sturgeon (Atlantic sturgeon [*Acipenser oxyrinchus*] and shortnose sturgeon [*Acipenser brevirostrum*]) as species groups;
- Expansion of the sampling frame for NE and MA lobster pot fleets to include all vessels holding a federal lobster permit on April 1, 2024, when mandatory VTR reporting for all federal lobster permit holders becomes effective; and
- Use of a PTNS-like system for all fleets.

7. ACCURACY AND POTENTIAL SOURCES OF BIAS ANALYSES

7.1 Methods

Vessel Selection Bias: Qualitative Analysis

The annual 2021, 2022, and 2023 SBRM data sets for VTR and OB were used. The numbers of annual trips for each distinct vessel were summed within each data set, fleet, and SBRM year. Vessels were ordered by annual number of trips (largest to smallest) and partitioned into ordered groups of 3 (triplets) to evaluate the cumulative sum of trips within each vessel group for each fleet and SBRM year. A similar procedure was done to evaluate the cumulative percentage of the annual kept weight of all species where the vessels were ordered by the sum of the annual kept weight of all species for a given vessel, from largest to smallest. Then the vessels were partitioned into ordered groups of 3 (triplets) and the kept weight was converted to the percentage of the sum of the kept weight of all species for each fleet and SBRM year, and summed over the number of distinct vessel groups.

Observer Bias

In this report, observer bias is defined as a differential outcome of a trip when an observer is present compared to when an observer is not present on a commercial fishing trip. Two trip outcomes were examined to determine if observer bias occurred in SBRM 2021-2023: mean trip duration and mean kept weight of all species on unobserved and observed VTR trips within a fleet.

The VTR trips used in the annual SBRM data sets were tagged as either unobserved or observed and evaluated for effects on mean trip duration and mean kept weight. From July 2019 through June 2022, the VTR serial number reported on any observed trips in the NEFSC's observer

database was used to find the corresponding VTR trip identifier in the VTR database and then matched to VTR trips within the SBRM analysis data set. If a VTR trip had an observer of any kind, then the trip was tagged as observed. Additionally, a trip mid-point matching scheme was also used to identify VTR trips that had an observer on board. For a given permit, a VTR and observed trip were considered a match if the midpoint of the VTR trip fell between the dates of the observer trip. When a match occurred, the VTR trip was tagged as observed for this method. If a VTR trip was tagged as observed by either method, the VTR trip was marked as observed for the analysis. The means of each metric were derived for each VTR trip group (unobserved and observed) within each fleet for fleets in which there were at least 30 observed trips. Although the NE and MA surfclam and ocean quahog dredge fleets were excluded from the analysis because these fleets had less than 30 observed trips (Table 6), these fleets would have also been excluded from this analysis because this fishery does not report a standard VTR (no VTR serial number available to distinguish a unique trip) and the trip's sail dates are not reported in the clam logbook or dealer data. Plots of unobserved and observed mean trip duration and mean kept weight of all species by fleets were made for each SBRM year for cells with at least 3 distinct permits. A linear regression with 68% confidence ellipse was shown for each plot to demonstrate the strength of the relationship. The actual difference of mean trip duration and the actual difference of mean kept weight of all species between VTR trip groups (unobserved minus observed) were derived by fleet and SBRM year.

7.2 Results

Vessel Selection Bias: Qualitative Analysis

Across several fleets, there are a few vessel groups that appear to have been selected at high or low rates relative to the fleet coverage rate (Figure 16). Some variation in vessel selection rates is expected because of random sampling within a fleet, which may contribute to variations in individual vessel groups. Additionally, vessels can be temporarily placed on "do not deploy" status due to vessel safety concerns, which can contribute to vessel level disparities in selection rates (Palmer et al. 2013). Observed trips generally occurred over the range of number of trips and the cumulative distribution of annual kept weight by a vessel group within a fleet and SBRM year (Figure 16, right-hand plots).

Observer Bias

There were 36 fleets (unique SBRM year and fleet combinations) with 30 or more observed VTR trips (Table 25). These fleets were mostly composed of otter trawl, gillnet, and scallop dredge gears (only 1 longline fleet). The sample sizes varied by SBRM year and fleet, with sample sizes of unobserved VTR and observed trips generally greater than 1,500 trips and 100 trips, respectively. The mean trip duration and mean kept weight of all species for unobserved and observed VTR trips by SBRM year and fleet are given in Table 25 and Figure 17.

For differences in mean trip duration, the annual 68% confidence ellipses of the linear regression are centered on the identity line, indicating no strong, large-scale systematic bias for these fleets (Figure 17, left plot). The differences in mean trip duration ranged from -1.19 to 0.87 days, with a median difference of -0.11 days, which was similar to the 2020 SBRM 3-year review report. Of the 36 fleets examined, 28 fleets (78%) had differences of means less than 0 indicating observed trips were slightly longer in duration than unobserved trips; this was an increase from the last review report.

For differences in mean kept weight of all species, the annual 68% confidence ellipses are centered on the identity line, indicating no strong, large-scale systematic bias for these fleets; however, there were some SBRM years and fleet combinations outside the ellipse that were above and below the identity line (Figure 17, right plot). Similar to the last review report, the differences in mean kept weight of all species ranged between -27,634 and 2,309 pounds, with a median difference of -1,236 pounds. Of the 36 fleets examined, 24 fleets (67%) had differences in means less than 0 indicating the kept weight of all species was greater on observed trips than unobserved trips; this was decrease from the last review report.

Based on the difference of the means, the potential bias appears to be relatively small for trip duration and mean kept weight of all species.

7.3 Discussion

Vessel Selection Bias

Figure 16 was modified in this review report to analyze vessels in groups of 3 rather than individual vessels. The same vessel-level ordering criteria was applied as in prior review reports, so the results should be generally comparable. While grouping vessels into triplets produces somewhat of a smoothing effect between vessels within each vessel group and reduces vessel specific signals, Figure 16 still captures the critical relationship between observer coverage and effort (trips and kept catch) within each fleet in order to verify that observer coverage occurs proportionally with effort. Fleets with few numbers of participating vessels do not show clear patterns due to the limited number of data points after grouping into triplets. There are some observed trips for vessel groups without a VTR (red bars without a blue bar). These occurrences are not widespread and primarily occur in NE handline and MA and NE small mesh otter trawl fleets (Rows 4, 5 and 7, respectively; Figure 16, left hand plots). Cross-checking OB and VTR for subtrip reporting compliance is important when these data are audited. Mismatches may indicate possible VTR trips that have not reported all gear/mesh combinations used during a trip. Another contributing factor may be the use of mesh size groups. A boundary (use of cut-point to partition mesh size groups) must be used to define fleets; however, vessel-reported mesh size in the VTR and the observer data mesh size may not match in the fleet definition because the observer data mesh size for trawl gear is calculated as an average of 10 random and representative mesh size observations per gear each trip the gear is used, and trawl gear mesh can stretch and/or shrink with use over time.

There are multiple selection systems in use: PTNS for fleets associated with Northeast Multispecies and Atlantic herring FMPs, IVR system for fleets associated with the Atlantic sea scallop FMP, and dock-side intercept for the remaining fleets. Qualitative results by fleet do not reveal differences among selection systems. The use of the PTNS or a similar system would improve vessel selection in some fleets. The Atlantic sea scallop FMP notification requirement is planned to transition from the IVR system to PTNS on April 1, 2024, which is expected to improve vessel selections in these fleets. With the expansion to 3 FMPs (Northeast Multispecies, Atlantic herring, and Atlantic sea scallop), the PTNS is demonstrating its ability to accommodate the notification requirements of new fisheries and is expected to have the capacity to do so for other fisheries in the future.

Additional follow-up analyses of years post-COVID-19's primary disruptions should be considered in the next 3-year report regarding potential vessel selection bias.

Observer Bias

Database limitations require multiple approaches to identify VTR trips. There may be some VTR trips that were observed but not identified as such. All observed trips (including those trips that were not used in SBRM) were used to identify which VTR trips had an observer on board. Matching and integration of observer and VTR records is expected to improve with the adoption of the regional CAMS in the future.

Some SBRM fleets are known to have skewed distributions for trip duration and/or kept weight of all species because of the vessel composition within a fleet (e.g., vessel size, port location). The shape of the distribution was not considered, thus the mean as a measure of central tendency may not be appropriate for all fleets. Medians or other metrics could be used to express this information.

Given the effects on observer deployments in SBRM 2021 and 2022 from COVID-19 pandemic-related waivers and operational impacts, pursuing a comprehensive examination of potential bias in all SBRM fleets in this review report is not warranted and is better suited for a time period with a complete, uninterrupted observer data series. The SBRM FMAT/PDT continues to recommend a detailed examination of potential bias in all fleets as a Research Track special topic, which could consider additional trip outcome metrics such as mean number of species reported, number of areas fished, differences between quota restricted species, and an evaluation of minimum observer sample size (i.e., could fleets with less than 30 observed trips be considered?), as well as examining different scales such as individual species vs. species groups and individual vessels vs. fleets. Additionally, the use of 30 observed trips (the minimum sample size selected for the bias analysis) is greater than the minimum pilot coverage (12 observed trips) prescribed for some fleets resulting in the exclusion of minimum pilot coverage fleets from the bias analysis.

8. IMPLICATIONS FOR MANAGEMENT

8.1 Consequences to Management when SBRM Performance Standard is Not Met

Species Managed Under Council FMP or Protected Under ESA

For fish and invertebrates, the species group and fleet combinations for which the SBRM performance standard was “Not Met” are listed in Table 23. Overall, there were 17 species group/fleet combinations with “Not Met” cells in SBRM 2023:

- Spiny dogfish in MA small mesh otter trawl, NE large mesh otter trawl, NE large mesh haddock separator trawl, and NE large mesh gillnet.
- Fluke-scup-black sea bass in MA small mesh otter trawl, MA large mesh otter trawl, and NE large mesh otter trawl.
- Small mesh groundfish in MA small mesh otter trawl, NE small mesh otter trawl, NE limited access scallop dredge, and NE pots and traps.
- Monkfish in MA access area limited access scallop dredge, MA limited access scallop dredge, and MA ocean quahog/surfclam dredge.
- Squid-butterfish-mackerel in MA small mesh otter trawl.

- Skates in MA small mesh otter trawl and MA access area limited access scallop dredge.

For turtles, the SBRM performance standard was met for estimates of loggerheads used in SBRM 2021-2023 for MA trawl gears and for estimates used in SBRM 2021 and 2022 for MA/GB sink gillnet gear (Table 2; Table 18). It was not met for estimates of any non-loggerhead species or for loggerheads used in SBRM 2021-2023 for GB trawl gears and for estimates of loggerheads used in SBRM 2023 for MA/GOM gillnet gear. It is not surprising that all non-loggerhead species and loggerheads on GB did not meet the 30% CV target in trawl gears because monitoring for turtles was mainly driven by other marine species groups due to the rarity filter.

The SBRM performance standard may not be achieved if there are insufficient sea days in a given fleet. Inadequately funded fleets (caused by a funding shortfall or policy decisions to not fully fund selected fleets) and/or unaccomplished sea days may result in insufficient sample sizes and CVs that are greater than 30% for 1 or more species groups within a given fleet. There were 25 fleets that were not fully funded in SBRM 2021-2023, that resulted from the sea day prioritization process (see Section 3 for details).

There is a temporal difference between the SBRM analysis timeframe (July through June) versus the annual sea day allocation cycle (April through March), which may also differ from the ultimate use of discard data for (e.g., many stock assessments use January through December and quota monitoring adheres to FMP fishing year). As a result, the impacts to estimated discard precision may be spread over multiple analysis periods.

Unknown cells are those in which the CV was unknown because of no or insufficient observer coverage (pilot fleets) and are listed in Table 21. These cells are generally unlikely to produce substantial discards and would usually be filtered out in the SBRM prioritization process. Consequently, these unknown cells are not expected to change catch estimates that would impact management decisions. Since only SBRM 2023 was available for analysis, year-to-year trends cannot be compared.

For the scallop fishery, the number of sea days assigned to the fishery has exceeded the amount SBRM dictates for years 2021-2023. The observer coverage to monitor the scallop fleets is partly funded by the scallop observer set-aside program, and federal funding is used to cover shore-side administrative costs. The scallop FMP established the observer set-aside program (IFS Program that increases coverage beyond SBRM) to improve bycatch estimates of finfish caught in the scallop fishery, monitor interactions of the scallop fishery with endangered and threatened sea turtles, and provide for at-sea biological sampling.

Fish and invertebrates Species Groups

As mentioned above, each year, some species group/fleet combinations may not achieve the performance standard for estimating discards. When evaluating the impacts to management, it is also useful to consider the precision of total discards of a species group combined across all fleets (this statement is not suggesting that the performance standard should be changed). Table 15 lists the species groups and the total amount kept and discarded in SBRM 2023, the only year in the review report where discards were estimated. Of the estimates of total discards, there were 4 instances in which the precision of the total discards of a species group exceeded a 30% CV. These were: Atlantic herring (51% CV), bluefish (33% CV), ocean quahog/surfclam (140% CV), and tilefish (34% CV). In all of these cases, discards represented less than 1.5% of total catch except for bluefish (13%), indicating the limited impact on total catch estimation for these species groups with CVs above the SBRM performance standard.

In the annual discard reports, Table 5B in McAfee and Wigley (2023) breaks out the CVs of individual species within each species group. When examined by individual species, there are additional cases where the total estimated discards across all fleets has a CV greater than 30%. These were: Atlantic cod (*Gadus morhua*; 123% CV), Atlantic wolffish (*Anarhichas lupus*; 51% CV), haddock (*Melanogrammus aeglefinus*; 33% CV), pollock (*Pollachius virens*; 38%), redfish (*Sebastes fasciatus*; 261% CV), white hake (*Urophycis tenuis*; 64% CV), offshore hake (*Merluccius albidus*; 79% CV), red hake (*Urophycis chuss*; 33% CV), Atlantic chub mackerel (*Scomber colias*; 47% CV), blueline tilefish (*Caulolatilus microps*; 38% CV), and golden tilefish (*Lopholatilus chamaeleonticeps*; 38% CV). While the SBRM 30% CV performance standard applies to species group and fleet combinations, lower precision of estimated discards for these individual species may impact efforts to assess and manage these species. For the majority of these species with discard CVs above 30%, the total amount of fish discarded was less than 10% of total catch (though that percentage is more uncertain given the higher CVs). Discards exceeded the amount kept for 3 of these species: Atlantic wolffish, which has regulations that limit retention; offshore hake, where the amount discarded often exceeds the amount kept but overall catch is low; and red hake, where discards consistently exceed kept and discards have represented an increasingly higher proportion of catch since SBRM 2019.

Some species are managed at a stock level that is not coastwide. To provide additional perspective on CVs at the stock level, Table 26 summarizes the available discard CVs used in recent Northeast assessments or other data products from 2019-2022 for SBRM and non-SBRM species. For the stocks with available information, on average 31% exceeded a 30% CV for total estimated discards. Total estimated discards used in the stock assessments represent 1 or often more fleets; the largest contribution to the total discard will contribute the most to the resulting discard precision at the stock level.

It is important to note that discard uncertainty is not the only source of uncertainty in an assessment. Other inputs such as survey indices, natural mortality assumptions, and catchability assumptions all have varying degrees of uncertainty, and that uncertainty may or may not be integrated into assessments. Also, various sources of observer uncertainty (e.g., measurement error, species identification error) are not incorporated into discard CVs. If discard estimates are or become a substantial source of mortality, lower precision discard estimates could potentially impact management. Assessment results could become less precise, leading to inconsistent estimates of stock status and sustainable catches. If discard imprecision increases overfishing limit (OFL) uncertainty, a Council's Scientific and Statistical Committee (SSC) may recommend a lower Acceptable Biological Catch (ABC) limit, which could potentially lead to foregone yield. While SSCs have not specifically tied uncertainty in estimated bycatch to particular ABC reductions, the MAFMC SSC has highlighted the uncertainty in commercial discards as a consideration in its application of the Council's risk policy in recommending ABC for some species. Highly imprecise discard estimates could also lead to mistaken annual catch limit (ACL) overages and reactive paybacks that can disrupt future fishing years. In such a situation, a Council may use management uncertainty buffers or larger discard set-asides to decrease chances of an ACL overage, which further reduce fishing opportunities and yield. While these kinds of paybacks and subsequent uses of larger buffers have not happened to date, proactive management uncertainty buffers have been used in the management of butterfish and Atlantic mackerel partly to account for the variability in discard estimates, even though the estimates are not imprecise by SBRM standards. The Northeast Skate Complex FMP also uses an uncertainty buffer between the

ABC and total annual limit, partially because of concerns about discard imprecision (NEFMC 2018a). The OFL is not defined for the skate complex.

ESA Species

Currently, estimates of interactions between commercial fishing gear and sea turtles are available for trawl (Murray 2020), gillnet (Murray 2018, 2023), and scallop dredge (Murray 2021) gears throughout different parts of the Northwest Atlantic depending on where bycatch occurred. These bycatch estimates are used by ESA Section 7 biologists to assess whether authorization of the fisheries would jeopardize the continued existence of the species. If authorization of a fishery is determined to jeopardize the species, mandatory reasonable and prudent alternatives are required to remove jeopardy. If the ESA Section 7 consultation concludes that a fishery will not jeopardize the continued existence of the species, an incidental take statement (ITS) is issued. Mandatory reasonable and prudent measures and terms and conditions accompany the ITS. These measures are designed to minimize and monitor the impact of the fishery on the species.

As these estimates are used to assess fishery impacts to sea turtle species, changes in the precision (i.e., CV) of these estimates have potential implications for management. Less precise estimates (i.e., CV >30%) will have larger confidence intervals. Regardless of higher uncertainty in the bycatch estimate, it is still the best available information and will be used in combination with other data sources to assess fishery impacts to sea turtle species. To avoid underestimating impacts to sea turtles, the upper ends of the catch estimates' confidence intervals are often used in an assessment of impacts. Therefore, with less precision, the assessed level of sea turtle incidental take may be higher than what is actually occurring, resulting in an overestimate of impacts a fishery may be having on a sea turtle species. Overestimating fishery impacts to sea turtle species could increase the chance an ESA Section 7 consultation would determine a fishery jeopardizes the continued existence of these species. Any management decisions concluded during ESA Section 7 consultation remain in place until new information becomes available to potentially change this determination.

Atlantic salmon bycatch is very rarely observed (Wigley et al. 2011, 2021; Hogan et al. 2019), and no bycatch was observed in SBRM 2021-2023 (Table 9). In evaluating the number of fleets by performance classification for SBRM 2023 (Table 21), Atlantic salmon were always classified as "not applicable" or "unknown". Sea days required to monitor Atlantic salmon bycatch with 30% CV precision have not been projected because of the low encounter rate of these species.

Although this finding could have management implications, observer coverage levels in SBRM fleets operating in the Greater Atlantic Region are driven by other fish species groups, many of which overlap in time and space with Atlantic salmon. This overlap ensures that some level of coverage still exists to help monitor Atlantic salmon bycatch and inform management (e.g., ESA section 7). The observed bycatch data from these programs is considered in recovery planning, Section 7 consultation, and other management actions.

8.2 Other Management Implications: Non-Federally Managed Species

While not directly related to SBRM performance (since non-federally managed species are not included in the SBRM), there are regular occasions when discards of non-federally managed species are caught in federally managed fisheries, and these discards may be important for assessment/management purposes. The precision of the discard estimate from these non-federally managed species does not determine SBRM observer sea day coverage, but observers record all

catch on observed hauls when on a trip, so data are generated for non-SBRM species. Data collected under the SBRM is used to estimate the discards of non-federally managed species in federal fisheries, like river herring and shad catch caps in the Atlantic herring and mackerel FMPs (MAFMC 2013; NEFMC 2014a).

Councils may develop separate monitoring programs, such as industry-funded monitoring for the Atlantic herring fishery (related to river herring bycatch) to address perceived coverage gaps. The SBRM framework also allows for contributions and collaboration with non-federal stakeholders to increase observer coverage above the level called for by the SBRM, which could improve CVs for non-federally managed species in federal fleets. For example, the ASMFC had secured funding through the Atlantic Coastal Cooperative Statistics Program to increase observer coverage to improve discard estimates in fleets of interest in the MA region for several years. While this increased coverage can provide more precise discard estimates, it can also cause outreach problems as fishermen are approached more often for observer coverage than they would be under the standard SBRM allocation. In addition, monitoring programs with different goals/objectives or stratification from the SBRM may be very difficult to combine. As mentioned previously, the SBRM was designed to meet the specific requirements of the MSA and, as a result, is focused on species managed under a Council FMP or protected under the ESA. Expanding the focus of the SBRM beyond these species would require careful consideration of the potential implications. If the list of species groups considered within SBRM were to be expanded, then the next steps would include: (1) developing a list of non-federally managed species (all or a selected subset of species that occur in federal waters) that would particularly benefit from additional discard information that could be addressed through SBRM (before adding species, an evaluation of current discard information would need to occur); (2) exploring the stratification needed for non-federally managed species and evaluating if existing stratification of fleets is adequate; and (3) if appropriate, developing prioritization protocols for when funding is inadequate for fleets where the determining species is a non-federally managed species, including considering that coverage of fleets driven by non-federally managed species could result in lower precision of federally managed species' discards in other fleets if overall funding remains constant (or decreases). Hence, there is a distinction between considering non-federally managed species and considering additional species managed under a Council FMP or protected under the ESA.

SBRM data are also used for a wide variety of other purposes, such as conservation under the MMPA, quota monitoring, development of management alternatives by Councils, and public data requests. While SBRM data are often important for these purposes, the evaluation of the effectiveness of SBRM data for these other uses is beyond the scope of this report.

8.3 Management Implications: Summary

In summary, the precision of discard estimates could impact management, but there is no indication that current levels of precision (even those above 30% CV) are currently causing management difficulties for Council-managed species. The SBRM 3-year reviews will continue to look for management problems caused by imprecise discard estimates.

9. RECOMMENDATIONS AND CONCLUSIONS

Given the analytical limitations of this review report, the SBRM FMAT/PDT did not develop any new recommendations and overall continues to support the recommendations from the previous 2020 SBRM 3-year review report (Wigley et al. 2021).

- The SBRM FMAT/PDT endorses the refinements described within the 2021-2023 annual reports and continues to support the approach of applying refinements when needed and documenting the change in the annual reports. The refinements and their description ensures transparency and improvement to the regional SBRM. The SBRM FMAT/PDT also continues to recommend accounting for differences in taxon strata, when possible. Accounting for differences in taxon strata may be useful when additional species are included in the SBRM and could be an operational consideration when evaluating a species to be included in the SBRM. Adding new species groups using different stratification adds more complexity when combining the sea days required to monitor all species within the SBRM.
- The SBRM FMAT/PDT continues to recommend that rarity filters be developed and implemented, as appropriate, for other ESA-listed species such as Atlantic salmon and sturgeon. The SBRM FMAT/PDT also continues to recommend NEFSC and GARFO staff finalize a draft guidance document for adding new species to the SBRM. This document describes a process of adding new species, including the considerations that may depend on several factors such as: operational factors (e.g., data availability, stratification, estimation methods, filters, frequency of analyses), policy factors, spatial management factors (e.g., distinct population segments), and legal factors. Consideration of non-federally managed species would be beyond the scope of the draft guidance document. The draft guidance document would be considered by NEFSC, GARFO, and NOAA General Council (Northeast Section) when determining if a new species can be added. Supporting information on the species encountered on observed trips could be obtained from this report and incorporated into the draft guidance document as part of the data availability for a given FMP or ESA-listed species.
- The SBRM FMAT/PDT continues to recommend expanding existing VTR audits to reduce and/or prevent "erroneous" fleets. Expanded VTR audits could focus primarily on gear type and mesh size (stratification variables) and could include data leveraging between databases, cross-checking regulations, and use of vessel profiles. The new regional CAMS can be leveraged to help integrate multiple sources of data at the trip level for cross-checking and validation, such as comparing the number of gear-mesh combinations used during a trip between observer and VTR reported data. Additionally, gear code consistency is needed between the fishery-dependent data collection systems.
- The SBRM FMAT/PDT continues to recommend the following planned changes (some of which are planned to be implemented in 2024 SBRM annual analysis):

    - consideration of ESA-list species such as sturgeon (Atlantic sturgeon and shortnose sturgeon) as species groups;
    - expansion of the sampling frame for NE and MA lobster pot fleets to include all vessels using a federal lobster permit; and
    - use of a PTNS-like system for all fleets similar to the expansion to scallop fleets in April 2024.

- The SBRM FMAT/PDT recommends continued exclusion of the individual FMP compliance monitoring program trips from future SBRM annual analyses of discard estimation, precision, and sample size for fish.
- The SBRM FMAT/PDT recommends continued use of importance filters for fish/invertebrates and rarity filters for sea turtles. The SBRM Omnibus Amendment requires 30% CV or less to be attained for each species group within that fleet. Some fleet/species combinations contribute very little to the total mortality or discard of the species but may require significant resources to characterize the precision of the estimate. Thus, the use of the importance filter is a key feature to the SBRM in that it focuses the sampling to fleets where it is needed most and not wasted on small, imprecisely estimated discards.
- The SBRM FMAT/PDT recommends continued use of the formulaic prioritization process for transparent determination of how limited funds are allocated.
- The SBRM FMAT/PDT recommends continued use of the most recent data available to track changes in discarding because of changes in management or fleet behavior when allocating future observer coverage. An analysis of variance stability was not undertaken in this review due to data limitations from the COVID-19 pandemic, which caused the sample size analysis to only be conducted in SBRM 2023. Based on assumptions and evidence from this and past reviews, it is best to conduct sample size analyses annually to minimize lags between sea day estimation updates in order to generate stable discard variances over time. Discrete changes in regulations or fish populations can still potentially impact the effectiveness of using data from the previous year to allocate future observer coverage. Therefore, periodically analyzing these effects is warranted.
- The SBRM FMAT/PDT recommends continued exploration of potential biases in the data collection process and examination of how these might impact sea day allocations. Due to COVID-19 pandemic impacts on observer deployments during this review period, it was not feasible to perform an in-depth evaluation of bias. The SBRM FMAT/PDT acknowledges that a comprehensive examination of potential bias in all SBRM fleets is a large task and has been too large to completely accomplish within the annual reporting and 3-year review reporting cycles. Hence, the SBRM FMAT/PDT recommends a dedicated group be formed to examine this topic in detail, such as a Research Track special topic assessment.

The SBRM provides a general structure for defining fisheries into homogeneous groups and objectively allocating observer coverage based on prior information to achieve a preselected precision criterion (30% CV) while following a predetermined set of rules to eliminate fleets with highly imprecise estimates of small amounts of discards. This approach allows for changes in sea day allocation from year to year as new information is obtained. The general structure helps identify gaps in existing coverage and the tradeoffs associated with coverage levels for different species. Additionally, the incorporation of annual refinements supports continual improvements. These refinements address new issues as they arise because of changes in fleet behavior, regulatory changes, and/or advances in statistical techniques. This 3-year review allows examination of the successes and challenges remaining.

The sea day requirements for a particular fleet to achieve the desired 30% CV can vary from year to year as the result of sampling, fishing practices, fish population demographics, and

other factors that vary from year to year. The number of observer sea days required might change when the total landings, total discards, and/or the relative amount of discards within a fleet change for a species group because this information is used in determining the relative importance of the discards for the species group and fleet. The amount of funding to support the required sea days is equally important in determining the final allocation of sea days. And finally, the ability to accomplish funded sea days is crucial for generating needed information for subsequent SBRM analyses.

Overall, the SBRM represents one of the most comprehensive programs for planning and executing design-based observer monitoring coverage of federally managed fisheries. Despite completing the full statistical analysis for only 1 of the 3 SBRM years in this review report, the SBRM process demonstrated its capacity to adapt to the unprecedented circumstances of the COVID-19 pandemic and was able to continue to meet its requirement to annually allocate observer coverage.

TABLES

Table 1. Species groups, fleets, time frames of data used for the discard estimation, precision, and sample size analyses for the 14 fish/invertebrate species groups, and the corresponding sea day schedule for Standardized Bycatch Reporting Methodology (SBRM) 2021, 2022, and 2023.

SBRM	Species Group	Fleets	Time Frame of Data	References	Sea Day Schedule
2021*	14 Fish/inverts (41 species)	62	July 2019-June 2020	Wigley and Tholke 2020	April 2021-March 2022
2022*	14 Fish/inverts (41 species)	62	July 2020-June 2021	Wigley and Tholke 2020	April 2022-March 2023
2023	14 Fish/inverts (42 species)	64	July 2021-June 2022	McAfee and Wigley 2023	April 2023-March 2024

*Wigley and Tholke (2020) was used in SBRM years 2021 and 2022 because the full statistical analysis was not completed in those years due to observer data gaps from the COVID-19 pandemic.

Table 2. Time series for most recent sea turtle discard estimates and the Standardized Bycatch Reporting Methodology (SBRM) year informed by these estimates. Cc=Loggerhead (*Caretta caretta*), Cm=Green turtle, (*Chelonia mydas*) Lk=Kemp's ridley (*Lepidochelys kempii*), Dc=Leatherback (*Dermochelys coriacea*), Unk=unidentified hard-shelled species.

Gear Type	Species	Time Frame	SBRM Year	Reference
Sink Gillnet	Cc, Lk, Dc, Unk	January 2012-December 2016	2021, 2022	Murray (2018)
Sink Gillnet	Cc, Lk, Dc, Cm, Unk	January 2017-December 2021	2023	Murray (2023)
Bottom Otter Trawl (includes Scallop Trawl)	Cc, Lk, Dc, Cm	January 2014-December 2018	2021, 2022, 2023	Murray (2020)

Table 3. List of management actions associated with monitoring of federal fisheries since the implementation of original Standardized Bycatch Reporting Methodology (SBRM) in 2008. EFH = Essential Fish Habitat, ASM = At-Sea Monitoring, NMFS = National Marine Fisheries Service, IFM = Industry-Funded Monitoring.

Fishery Management Plan (FMP)	Measures	Reference
Atlantic Mackerel, Squid, and Butterfish Amendment 10	Created a butterfish mortality cap that required more rapid transmission of observer data to Regional Office	MAFMC (2009)
Northeast Multispecies Framework 48	Clarified goals and objectives of ASM	NEFMC (2013a)
Atlantic Herring Amendment 5	Improved catch information, enhanced monitoring and sampling of catch at-sea, addressed bycatch issues	NEFMC (2013b)
Skate Framework 2	Improved catch information (i.e., species-level reporting)	NEFMC (2014b)
Atlantic Mackerel, Squid, and Butterfish Amendment 14	Implemented a variety of reporting and monitoring requirements for Atlantic mackerel and longfin squid fisheries, and implemented a river herring and shad catch cap for the Atlantic mackerel fishery	MAFMC (2013)
Standardized Bycatch Reporting Methodology An Omnibus Amendment to the Fishery Management Plans of the Mid-Atlantic and New England Regional Fishery Management Councils	Explained the methods and processes by which bycatch is currently monitored and assessed for Greater Atlantic Region fisheries; determined whether these methods and processes need to be modified and/or supplemented; established standards of precision for bycatch estimation for all Greater Atlantic Region fisheries; and thereby documented the SBRM established for all fisheries managed through the FMPs of the Greater Atlantic Region	NEFMC, MAFMC, NMFS (2015)

Fishery Management Plan (FMP)	Measures	Reference
Atlantic Mackerel, Squid, and Butterfish Framework 9	Established measures to enhance catch monitoring and address slippage (catch that is discarded before it has been sampled by observers) in the Atlantic mackerel fishery	MAFMC (2015)
Northeast Multispecies Framework 55	Adjusted ASM program to ensure likelihood that discards for groundfish stocks monitored at 30% coefficient of variation	NEFMC (2016)
Blueline Tilefish Amendment 6	Addition of blueline tilefish (*Caulolatilus microps*) to tilefish FMP	MAFMC (2017)
Industry-funded Monitoring Omnibus Amendment	Omnibus amendment standardizing IFM programs (e.g., service provider requirements, NMFS and industry cost responsibilities, process to prioritize federal funding) across all New England FMPs except Northeast multispecies and scallops. Established an IFM program for the herring fishery that operated from July 2021 to April 2023	NEFMC (2018b)
American Lobster Addendum XXVI to Amendment 3 and Jonah Crab Addendum III	Recommended mandatory reporting for federally permitted harvesters; increased detail on area fished and gear configuration	ASMFC (2018)
Atlantic Mackerel, Squid, and Butterfish Amendment 21.	Added chub mackerel (*Scomber colias*) to the Atlantic Mackerel, Squid, and Butterfish FMP	MAFMC (2019)
Northeast Multispecies 2021 Sector Rule	Announced the agency's determination that electronic monitoring is sufficient for use to meet IFM requirements as an alternative to ASM; amended regulations to administer electronic monitoring	Proposed rule (86 FR 16686); Final rule (86 FR 22898)
Northeast Multispecies Amendment 23	Adjusted the existing industry-funded ASM program for groundfish sectors to improve the accuracy of collected catch data and catch accounting. To address bias, the coverage target would be up to 100% of trips for 4 years based on available federal funding. In years 5+, the coverage target defaults to 40%. Allows increased coverage in year 5+ when federal funding is available. Also approved an additional electronic monitoring model to use in place of human ASM.	NEFMC (2022b)
Atlantic Sea Scallop Amendment 21	Expanded observer call-in requirement for the Northern Gulf of Maine scallop fishery	NEFMC (2022a)

Table 4. Fleet stratification abbreviations used in fish/invertebrate sections.

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 area
OPEN	Non-access area
GEN	General category
LIM	Limited access category

Table 5. List of the 14 fish and invertebrate species groups (in bold), with species group abbreviations in parentheses and scientific names in italics, and the species that compose these groups, corresponding to the 13 federal fishery management plans implemented in the waters off the northeastern United States.

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

Table 6. Number of observed (OB) and Vessel Trip Report (VTR) trips and percentage of observer coverage, by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. An * indicates OB trips greater than VTR trips. "P" indicates fleets for which pilot coverage was assigned. See Table 4 for fleet stratification abbreviations.

Fleet						SBRM 2021				SBRM 2022				SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot
1	Longline, Bottom	OPEN	all	MA	all	8	104	7.7		4	132	3.0	P	13	123	10.6	
2	Longline, Bottom	OPEN	all	NE	all	28	731	3.8		2	736	0.3	P	16	294	5.4	
3	Hand Line	OPEN	all	MA	all	12	2,567	0.5		6	2,469	0.2	P	13	2,528	0.5	
4	Hand Line	OPEN	all	NE	all	37	1,632	2.3		3	1,667	0.2	P	24	1,728	1.4	
5	Otter Trawl	OPEN	all	MA	sm	446	2,858	15.6		58	2,530	2.3		160	2,308	6.9	
6	Otter Trawl	OPEN	all	MA	lg	254	3,655	6.9		46	3,587	1.3		138	3,001	4.6	
7	Otter Trawl	OPEN	all	NE	sm	229	3,199	7.2		83	3,109	2.7		194	2,540	7.6	
8	Otter Trawl	OPEN	all	NE	lg	359	5,081	7.1		130	5,082	2.6		195	4,608	4.2	
9	Otter Trawl, Scallop	AA	GEN	MA	lg		167		P		29		P				
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	4	24	16.7			33		P		32		P
11	Otter Trawl, Twin	OPEN	all	MA	sm	6	67	9.0		3	58	5.2	P	9	68	13.2	
12	Otter Trawl, Twin	OPEN	all	MA	lg	3	78	3.8		3	56	5.4	P		10		P
13	Otter Trawl, Twin	OPEN	all	NE	sm	1	8	12.5	P	1	11	9.1	P		15		P
14	Otter Trawl, Ruhle	OPEN	all	MA	sm		13		P		17		P		4		P
15	Otter Trawl, Ruhle	OPEN	all	MA	lg						9		P		3		P
16	Otter Trawl, Ruhle	OPEN	all	NE	sm		27		P	1	33	3.0	P	1	24	4.2	P
17	Otter Trawl, Ruhle	OPEN	all	NE	lg										11		P
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm						19		P		37		P
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	7	89	7.9		3	92	3.3	P	6	57	10.5	
20	Otter Trawl, Shrimp	OPEN	all	MA	sm		70		P		65		P		55		P
21	Otter Trawl, Shrimp	OPEN	all	NE	sm		23		P								
22	Otter Trawl, Other	OPEN	all	MA	sm		18		P		18		P		84		P
23	Otter Trawl, Other	OPEN	all	MA	lg						15		P		129		P
24	Otter Trawl, Other	OPEN	all	NE	sm		68		P		31		P		71		P
25	Otter Trawl, Other	OPEN	all	NE	lg		51		P		16		P		53		P
26	Haul Seine, Beach	OPEN	all	NE	all										13		P
27	Floating Trap	OPEN	all	MA	all		6		P						5		P
28	Floating Trap	OPEN	all	NE	all		42		P		173		P		460		P
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	167	1,771	9.4		19	864	2.2		23	1,171	2.0	
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	142	1,566	9.1		24	1,402	1.7		95	1,278	7.4	

Fleet						SBRM 2021				SBRM 2022				SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	95	1,016	9.4		4	636	0.6	P	52	562	9.3	
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	9	56	16.1			12		P		6		P
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	109	1,601	6.8		40	1,589	2.5		55	1,035	5.3	
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	80	2,767	2.9		71	2,367	3.0		153	1,950	7.8	
35	Purse Seine	OPEN	all	MA	all		92		P		153		P		339		P
36	Purse Seine	OPEN	all	NE	all	1	537	0.2	P	2	738	0.3	P	5	613	0.8	
37	Dredge, Scallop	AA	GEN	MA	all	24	1,405	1.7		3	540	0.6	P	3	190	1.6	
38	Dredge, Scallop	AA	GEN	NE	all	1	457	0.2	P	8	2,158	0.4	P	70	3,994	1.8	
39	Dredge, Scallop	AA	LIM	MA	all	43	892	4.8		20	673	3.0		16	412	3.9	
40	Dredge, Scallop	AA	LIM	NE	all	105	1,699	6.2		76	1,464	5.2		104	1,568	6.6	
41	Dredge, Scallop	OPEN	GEN	MA	all	41	1,229	3.3		27	1,756	1.5		66	1,427	4.6	
42	Dredge, Scallop	OPEN	GEN	NE	all	61	3,501	1.7		27	2,211	1.2		67	2,090	3.2	
43	Dredge, Scallop	OPEN	LIM	MA	all	16	219	7.3		9	279	3.2	P	12	140	8.6	
44	Dredge, Scallop	OPEN	LIM	NE	all	50	713	7.0		46	1,003	4.6		67	875	7.7	
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg										8		P
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm						41		P	1	144	0.7	P
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									1	9	11.1	P
48	Trawl, Midwater	all	all	NE	sm	10	130	7.7		3	71	4.2	P	5	19	26.3	
49	Trawl, Midwater	OPEN	all	MA	sm	1	17	5.9	P		20		P				
50	Pots and Traps, Other	OPEN	all	MA	all						37		P				
51	Pots and Traps, Other	OPEN	all	NE	all		49		P		26		P		21		P
52	Pots and Traps, Fish	OPEN	all	MA	all	5	660	0.8	P	5	819	0.6	P	13	988	1.3	
53	Pots and Traps, Fish	OPEN	all	NE	all	6	700	0.9		7	978	0.7	P	18	1,025	1.8	
54	Pots and Traps, Eel	OPEN	all	NE	all										5		P
55	Pots and Traps, Conch	OPEN	all	MA	all	6	843	0.7		4	760	0.5	P	8	561	1.4	
56	Pots and Traps, Conch	OPEN	all	NE	all	6	981	0.6		6	961	0.6	P	12	852	1.4	
57	Pots and Traps, Hagfish	OPEN	all	NE	all	3	9	33.3			7		P				
58	Pots and Traps, Lobster	OPEN	all	MA	all	10	940	1.1		2	932	0.2	P	17	957	1.8	
59	Pots and Traps, Lobster	OPEN	all	NE	all	13	23,682	0.1		14	24,730	0.1		22	24,993	0.1	
60	Pots and Traps, Crab	OPEN	all	MA	all		6		P		24		P				
61	Pots and Traps, Crab	OPEN	all	NE	all	9	83	10.8		7	73	9.6	P	11	73	15.1	
62	Beam Trawl	OPEN	all	MA	sm		68		P		208		P		57		P
63	Beam Trawl	OPEN	all	NE	sm										13		P
64	Beam Trawl	OPEN	all	NE	lg										3		P

Fleet					SBRM 2021				SBRM 2022				SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot
65	Scottish Seine	OPEN	all	MA	sm										4		P
66	Dredge, Other	OPEN	all	MA	all		220		P		151		P		187		P
67	Dredge, Other	OPEN	all	NE	all		18		P		150		P		186		P
68	Dredge, Mussel	OPEN	all	NE	all						100		P		67		P
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	8	1,558	0.5		8	1,544	0.5	P	13	1,527	0.9	
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	10	1,490	0.7		10	1,384	0.7		12	1,252	1.0	
Total						**2,425**	**71,553**	**3.4**		**785**	**70,848**	**1.1**		**1,690**	**68,862**	**2.5**	

Table 7. Number of observed (OB) and Vessel Trip Report (VTR) sea days and percentage of observer coverage, by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. An * indicates OB sea days greater than VTR sea days. "P" indicates fleets for which pilot coverage was assigned. See Table 4 for fleet stratification abbreviations.

Fleet						SBRM 2021				SBRM 2022				SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot
1	Longline, Bottom	OPEN	all	MA	all	76	765	9.9		40	890	4.5	P	123	891	13.8	
2	Longline, Bottom	OPEN	all	NE	all	28	757	3.7		2	785	0.3	P	19	322	5.9	
3	Hand Line	OPEN	all	MA	all	12	2,785	0.4		6	2,695	0.2	P	13	2,783	0.5	
4	Hand Line	OPEN	all	NE	all	61	1,710	3.6		3	1,818	0.2	P	36	2,055	1.8	
5	Otter Trawl	OPEN	all	MA	sm	1,086	6,758	16.1		206	5,039	4.1		392	5,189	7.6	
6	Otter Trawl	OPEN	all	MA	lg	578	7,999	7.2		174	8,244	2.1		284	7,316	3.9	
7	Otter Trawl	OPEN	all	NE	sm	618	8,238	7.5		292	8,009	3.6		585	7,879	7.4	
8	Otter Trawl	OPEN	all	NE	lg	932	13,683	6.8		503	13,854	3.6		421	12,111	3.5	
9	Otter Trawl, Scallop	AA	GEN	MA	lg		344		P		72		P				
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	4	47	8.5			83		P		60		P
11	Otter Trawl, Twin	OPEN	all	MA	sm	20	203	9.9		3	145	2.1	P	22	164	13.4	
12	Otter Trawl, Twin	OPEN	all	MA	lg	3	83	3.6		4	85	4.7	P		41		P
13	Otter Trawl, Twin	OPEN	all	NE	sm	7	54	13.0	P	5	86	5.8	P		108		P
14	Otter Trawl, Ruhle	OPEN	all	MA	sm		93		P		83		P		30		P
15	Otter Trawl, Ruhle	OPEN	all	MA	lg						16		P		13		P
16	Otter Trawl, Ruhle	OPEN	all	NE	sm		117		P	4	146	2.7	P	3	123	2.4	P
17	Otter Trawl, Ruhle	OPEN	all	NE	lg										72		P
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm						165		P		321		P
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	54	662	8.2		25	716	3.5	P	43	436	9.9	
20	Otter Trawl, Shrimp	OPEN	all	MA	sm		245		P		452		P		437		P
21	Otter Trawl, Shrimp	OPEN	all	NE	sm		49		P								
22	Otter Trawl, Other	OPEN	all	MA	sm		70		P		54		P		242		P
23	Otter Trawl, Other	OPEN	all	MA	lg						21		P		460		P
24	Otter Trawl, Other	OPEN	all	NE	sm		392		P		222		P		229		P
25	Otter Trawl, Other	OPEN	all	NE	lg		154		P		81		P		113		P
26	Haul Seine, Beach	OPEN	all	NE	all										13		P
27	Floating Trap	OPEN	all	MA	all		6		P						16		P
28	Floating Trap	OPEN	all	NE	all		42		P		173		P		496		P
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	180	1,829	9.8		19	910	2.1		26	1,239	2.1	
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	148	1,632	9.1		24	1,450	1.7		97	1,305	7.4	

Fleet						SBRM 2021				SBRM 2022				SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	108	1,133	9.5		4	687	0.6	P	53	588	9.0	
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	9	58	15.5			13		P		7		P
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	134	2,006	6.7		70	2,058	3.4		65	1,352	4.8	
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	107	3,816	2.8		99	2,969	3.3		230	2,609	8.8	
35	Purse Seine	OPEN	all	MA	all		92		P		153		P		341		P
36	Purse Seine	OPEN	all	NE	all	3	665	0.5	P	7	887	0.8	P	7	653	1.1	
37	Dredge, Scallop	AA	GEN	MA	all	40	2,343	1.7		7	1,030	0.7	P	6	440	1.4	
38	Dredge, Scallop	AA	GEN	NE	all	3	920	0.3	P	20	3,207	0.6	P	111	5,331	2.1	
39	Dredge, Scallop	AA	LIM	MA	all	309	5,657	5.5		144	4,973	2.9		124	3,324	3.7	
40	Dredge, Scallop	AA	LIM	NE	all	833	13,872	6.0		682	12,802	5.3		868	13,297	6.5	
41	Dredge, Scallop	OPEN	GEN	MA	all	76	2,168	3.5		54	3,419	1.6		138	2,895	4.8	
42	Dredge, Scallop	OPEN	GEN	NE	all	117	4,997	2.3		53	3,366	1.6		124	3,221	3.8	
43	Dredge, Scallop	OPEN	LIM	MA	all	128	1,930	6.6		83	2,441	3.4	P	79	1,252	6.3	
44	Dredge, Scallop	OPEN	LIM	NE	all	447	6,698	6.7		421	9,333	4.5		594	8,305	7.2	
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg										8		P
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm						225		P	3	585	0.5	P
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									3	30	10.0	P
48	Trawl, Midwater	all	all	NE	sm	38	508	7.5		12	277	4.3	P	25	84	29.8	
49	Trawl, Midwater	OPEN	all	MA	sm	7	90	7.8	P		73		P				
50	Pots and Traps, Other	OPEN	all	MA	all						37		P				
51	Pots and Traps, Other	OPEN	all	NE	all		49		P		26		P		21		P
52	Pots and Traps, Fish	OPEN	all	MA	all	5	668	0.7	P	5	863	0.6	P	13	1,027	1.3	
53	Pots and Traps, Fish	OPEN	all	NE	all	6	716	0.8		7	1,053	0.7	P	18	1,064	1.7	
54	Pots and Traps, Eel	OPEN	all	NE	all										69		P
55	Pots and Traps, Conch	OPEN	all	MA	all	6	868	0.7		4	767	0.5	P	8	572	1.4	
56	Pots and Traps, Conch	OPEN	all	NE	all	6	983	0.6		6	964	0.6	P	12	859	1.4	
57	Pots and Traps, Hagfish	OPEN	all	NE	all	35	113	31.0			111		P				
58	Pots and Traps, Lobster	OPEN	all	MA	all	17	1,483	1.1		9	1,491	0.6	P	33	1,396	2.4	
59	Pots and Traps, Lobster	OPEN	all	NE	all	13	31,511	<0.1		24	33,176	0.1		22	32,977	0.1	
60	Pots and Traps, Crab	OPEN	all	MA	all		22		P		94		P				
61	Pots and Traps, Crab	OPEN	all	NE	all	86	623	13.8		61	534	11.4	P	107	628	17.0	
62	Beam Trawl	OPEN	all	MA	sm		119		P		231		P		59		P
63	Beam Trawl	OPEN	all	NE	sm										13		P
64	Beam Trawl	OPEN	all	NE	lg										9		P

Fleet					SBRM 2021				SBRM 2022				SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot	OB	VTR	Percent Coverage	Pilot
65	Scottish Seine	OPEN	all	MA	sm										9		P
66	Dredge, Other	OPEN	all	MA	all		226		P		176		P		271		P
67	Dredge, Other	OPEN	all	NE	all		25		P		150		P		343		P
68	Dredge, Mussel	OPEN	all	NE	all						100		P		67		P
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	23	3,098	0.7		27	3,430	0.8	P	42	3,166	1.3	
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	32	2,258	1.4		40	2,328	1.7		41	1,978	2.1	
Total						**6,395**	**138,432**	**4.6**		**3,149**	**139,738**	**2.3**		**4,790**	**133,314**	**3.6**	

Table 8. Data sources used in most recent sea turtle discard estimates and Standardized Bycatch Reporting Methodology (SBRM) year informed by these estimates (see reference documents for more detailed information, including effort metrics used in bycatch analyses). Data represented cover a 5-year time span. VTR = Vessel Trip Report.

Gear Type	Time Frame	Observed Trips	VTR Trips	% Coverage (Trips)	SBRM Year	Reference
Sink Gillnet	January 2012-December 2016	4,902	51,553	10%	2021, 2022	Murray (2018)
Sink Gillnet	January 2017-December 2021	5,221	46,556	11%	2023	Murray (2023)
Bottom Otter Trawl (includes Scallop Trawl)	January 2014-December 2018	7,703	78,082	10%	2021, 2022, 2023	Murray (2020)

Table 9. Observed catch weight (kept and discarded, live weight, lb) from observed trips for each of the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups, the 14 SBRM species groups combined, the non-SBRM species, and all species combined for SBRM 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data) and SBRM 2023 (July 2021 through June 2022 data). This summary includes data that cannot be classified to a fleet; all species excludes sea turtles, marine mammals, and sea birds.

	SBRM 2021		SBRM 2022		SBRM 2023	
Species Group	**Kept**	**Discarded**	**Kept**	**Discarded**	**Kept**	**Discarded**
ATLANTIC HERRING (Clupea harengus)	869,711	15,025	1,754,513	7,167	2,057,840	5,613
ATLANTIC SALMON (Salmo salar)	0	0	0	0	0	0
BLUEFISH (Pomatomus saltatrix)	98,797	4,120	11,514	1,131	93,614	7,191
FLUKE (Paralichthys dentatus) - SCUP (Stenotomus chrysops) - BLACK SEA BASS (Centropristis striata)	1,880,005	487,598	845,946	215,640	1,433,061	364,838
LARGE MESH GROUNDFISH	3,175,590	188,045	1,784,425	80,941	838,732	99,307
MONKFISH (Lophius americanus)	1,262,636	565,965	738,977	226,668	901,984	308,084
RED DEEPSEA CRAB (Chaceon quinquedens)	557,191	124,375	425,603	81,361	899,457	162,916
SEA SCALLOP (Placopecten magellanicus)	14,560,660	816,334	9,231,727	602,638	11,729,955	1,016,559
SKATE COMPLEX (Rajidae)	2,161,872	2,668,358	479,550	1,319,320	1,594,758	1,663,866
SMALL MESH GROUNDFISH	659,108	491,192	185,910	160,701	318,875	151,945
SPINY DOGFISH (Squalus acanthias)	1,423,005	836,393	142,618	282,112	540,790	325,560
SQUID (Doryteuthis [Amerigo] pealeii, Illex illecebrosus) - BUTTERFISH (Peprilus triacanthus) - MACKEREL (Scomber colias, Scomber scombrus)	8,766,715	402,383	3,205,312	133,772	5,037,553	555,148
SURFCLAM (Spisula solidissima) - OCEAN QUAHOG (Arctica islandica)	1,911,121	41,875	3,233,402	13,154	4,524,080	38,517
TILEFISH	118,735	1,266	77,140	364	259,888	1,475
14 SBRM Species Groups, Combined	*37,445,145*	*6,642,931*	*22,116,635*	*3,124,968*	*30,230,586*	*4,701,019*

	SBRM 2021		SBRM 2022		SBRM 2023	
Species Group	**Kept**	**Discarded**	**Kept**	**Discarded**	**Kept**	**Discarded**
Non-SBRM species	*1,687,897*	*3,557,915*	*354,494*	*2,593,454*	*646,690*	*2,575,220*
ALL SPECIES, COMBINED	**39,133,041**	**10,200,846**	**22,471,129**	**5,718,422**	**30,877,276**	**7,276,239**

Table 10. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: BLUEFISH (Pomatomus saltatrix)

						SBRM 2021			SBRM 2022			SBRM 2023		
Fleet						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all				25	0.0	6.0	23	576.7	8.8
2	Longline, Bottom	OPEN	all	NE	all									
3	Hand Line	OPEN	all	MA	all	25	1,188.1	9.0	50	1.5	7.8	14	6.2	0.0
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	46	13,798.4	645.6	31	3,202.5	19.8	34	67,370.9	573.8
6	Otter Trawl	OPEN	all	MA	lg	18	2,230.9	1,054.7	29	1,185.5	118.2	14	1,054.5	235.6
7	Otter Trawl	OPEN	all	NE	sm	48	6,523.1	459.0	27	2,820.0	322.6	33	1,848.3	2,032.3
8	Otter Trawl	OPEN	all	NE	lg	7	729.5	27.5	2	16.7	25.2	10	785.5	43.2
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg									
11	Otter Trawl, Twin	OPEN	all	MA	sm	67	32.1	17.6						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg									
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: BLUEFISH (Pomatomus saltatrix)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	37	28,148.1	159.0	43	265.7	0.8	40	6,456.5	0.0
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	14	6,004.6	85.7	12	207.0	129.0	16	6,915.3	4,104.1
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	9	113.2	127.9				19	371.2	31.4
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	26	30,297.3	1,389.9	14	3,463.7	9.5	12	7,774.8	0.0
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	12	208.5	104.5	10	45.5	71.7	8	155.3	130.3
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all									
38	Dredge, Scallop	AA	GEN	NE	all									
39	Dredge, Scallop	AA	LIM	MA	all									
40	Dredge, Scallop	AA	LIM	NE	all									
41	Dredge, Scallop	OPEN	GEN	MA	all									
42	Dredge, Scallop	OPEN	GEN	NE	all									
43	Dredge, Scallop	OPEN	LIM	MA	all									
44	Dredge, Scallop	OPEN	LIM	NE	all									
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm									
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all	20	37.2	0.0						
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all									
59	Pots and Traps, Lobster	OPEN	all	NE	all									
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all									

Species Group: BLUEFISH (Pomatomus saltatrix)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all									
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all									
Confidential Fleets						100	7,525.8	26.0	80	3.5	159.0			
Total						27	96,836.8	4,106.4	18	11,211.6	869.6	19	93,315.2	7,159.5

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: FLUKE (Paralichthys dentatus) - SCUP (Stenotomus chrysops) - BLACK SEA BASS (Centropristis striata)

						SBRM 2021			SBRM 2022			SBRM 2023		
Fleet						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all	25	18.0	0.0	75	5.0	7.8	15	8.8	3.0
2	Longline, Bottom	OPEN	all	NE	all	21	7.7	6.8				31	2.5	19.6
3	Hand Line	OPEN	all	MA	all	42	175.1	29.8	50	205.7	31.5	93	1,603.2	176.3
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	92	969,347.2	176,340.8	90	348,952.0	31,367.3	92	603,436.6	66,820.2
6	Otter Trawl	OPEN	all	MA	lg	97	512,605.6	66,159.6	94	246,656.1	14,384.6	93	306,890.8	23,184.4
7	Otter Trawl	OPEN	all	NE	sm	81	239,469.9	172,703.5	76	134,447.0	112,169.3	81	200,181.5	176,419.5
8	Otter Trawl	OPEN	all	NE	lg	48	90,194.2	36,066.6	29	55,624.7	17,007.2	55	135,748.0	28,953.7
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	100	495.3	24.0						
11	Otter Trawl, Twin	OPEN	all	MA	sm	100	847.0	1,391.7						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	14	0.0	4.0						
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: FLUKE (Paralichthys dentatus) - SCUP (Stenotomus chrysops) - BLACK SEA BASS (Centropristis striata)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	9	253.6	661.0	4	0.0	2.0	8	61.7	33.4
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	12	88.4	34.6	19	5.9	7.1	18	70.2	40.1
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	31	687.3	197.8				42	1,922.0	336.4
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	32	5,716.9	1,714.2	17	2,655.7	2.5	31	558.7	191.2
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	26	3,839.0	1,350.9	40	833.8	1,419.2	39	2,142.0	2,282.8
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all	4	0.0	0.4	100	48.8	35.1			
38	Dredge, Scallop	AA	GEN	NE	all				38	33.2	161.2	3	0.0	1.3
39	Dredge, Scallop	AA	LIM	MA	all	73	149.5	3,126.2	80	607.2	3,531.3	94	177.3	3,687.4
40	Dredge, Scallop	AA	LIM	NE	all	49	86.9	5,009.9	87	111.4	14,918.6	56	66.5	12,030.8
41	Dredge, Scallop	OPEN	GEN	MA	all	78	1,066.6	1,446.6	93	669.6	1,022.3	82	683.9	2,785.2
42	Dredge, Scallop	OPEN	GEN	NE	all	25	52.5	324.9	26	0.0	272.2	21	18.5	261.4
43	Dredge, Scallop	OPEN	LIM	MA	all	81	200.9	3,149.8	100	76.6	6,001.9	100	190.7	2,370.7
44	Dredge, Scallop	OPEN	LIM	NE	all	52	56.6	11,676.0	57	111.6	7,599.7	56	121.5	18,215.8
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm	8	0.0	29.2						
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all	100	5,706.9	910.4	100	10,468.6	795.3	100	11,903.1	1,175.9
53	Pots and Traps, Fish	OPEN	all	NE	all	100	607.2	173.6				100	6,392.8	3,689.8
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all	50	0.0	9.2	25	0.0	5.0	50	0.0	18.2
56	Pots and Traps, Conch	OPEN	all	NE	all	50	0.0	2.6				33	0.0	6.8
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all	80	149.9	221.9				82	5,133.9	474.4
59	Pots and Traps, Lobster	OPEN	all	NE	all				36	35.0	2.8	9	0.0	5.5
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all									
62	Beam Trawl	OPEN	all	MA	sm									

Species Group: FLUKE (Paralichthys dentatus) - SCUP (Stenotomus chrysops) - BLACK SEA BASS (Centropristis striata)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	44	18.0	70.3	75	0.0	77.3	31	0.0	44.3
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	40	9.1	76.8	60	0.0	32.0	42	0.0	83.2
Confidential Fleets						86	560.3	347.7	70	12,875.8	1,385.5	92	93,037.1	9,130.0
Total						55	1,832,409.6	483,260.8	56	814,423.7	212,238.7	56	1,370,351.3	352,441.3

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: ATLANTIC HERRING (Clupea harengus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all									
2	Longline, Bottom	OPEN	all	NE	all									
3	Hand Line	OPEN	all	MA	all									
4	Hand Line	OPEN	all	NE	all	3	5.4	0.0						
5	Otter Trawl	OPEN	all	MA	sm	4	4,087.8	549.8				5	289.3	112.0
6	Otter Trawl	OPEN	all	MA	lg	0	0.0	13.6						
7	Otter Trawl	OPEN	all	NE	sm	15	5,817.0	13,176.2	21	18,447.0	3,514.4	22	36,569.9	5,317.8
8	Otter Trawl	OPEN	all	NE	lg	13	25.6	221.7	15	12.6	171.2	13	11.3	136.5
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg									
11	Otter Trawl, Twin	OPEN	all	MA	sm									
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	57	0.0	41.3	33	0.0	0.8			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									

Species Group: ATLANTIC HERRING (Clupea harengus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
28	Floating Trap	OPEN	all	NE	all									
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm									
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	1	0.0	1.0						
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg									
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	1	0.0	1.1	7	32.6	0.7	1	0.0	0.6
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg									
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all	67	318,578.0	0.2				18	122,672.0	0.0
37	Dredge, Scallop	AA	GEN	MA	all									
38	Dredge, Scallop	AA	GEN	NE	all									
39	Dredge, Scallop	AA	LIM	MA	all									
40	Dredge, Scallop	AA	LIM	NE	all	1	0.0	0.4						
41	Dredge, Scallop	OPEN	GEN	MA	all							2	0.0	0.3
42	Dredge, Scallop	OPEN	GEN	NE	all	2	0.0	0.1						
43	Dredge, Scallop	OPEN	LIM	MA	all									
44	Dredge, Scallop	OPEN	LIM	NE	all				4	0.0	0.5	7	0.0	1.5
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm	92	541,197.0	18.3	100	1,463,245.0	3,448.7	83	1,898,297.0	1.0
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all									
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all									
59	Pots and Traps, Lobster	OPEN	all	NE	all				7	0.0	0.4			
60	Pots and Traps, Crab	OPEN	all	MA	all									

Species Group: ATLANTIC HERRING (Clupea harengus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
61	Pots and Traps, Crab	OPEN	all	NE	all									
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all									
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all									
Confidential Fleets						100	0.0	998.2	100	133,664.0	0.4	14	0.0	1.8
Total						7	869,710.8	15,021.9	15	1,615,401.2	7,137.1	12	2,057,839.5	5,571.5

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: LARGE MESH GROUNDFISH

						SBRM 2021			SBRM 2022			SBRM 2023		
Fleet						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all	25	5.9	3.2				8	0.0	11.7
2	Longline, Bottom	OPEN	all	NE	all	14	0.0	18.1				31	18,141.0	953.4
3	Hand Line	OPEN	all	MA	all							7	1.0	0.0
4	Hand Line	OPEN	all	NE	all	3	2.2	0.0				6	13.5	0.0
5	Otter Trawl	OPEN	all	MA	sm	70	775.5	25,200.6	33	0.0	1,297.4	51	25.4	5,931.7
6	Otter Trawl	OPEN	all	MA	lg	75	10,329.5	17,271.5	52	23.2	2,555.2	54	1,512.3	6,795.3
7	Otter Trawl	OPEN	all	NE	sm	85	258,385.7	34,792.9	71	44,627.3	14,723.2	71	23,957.6	17,855.0
8	Otter Trawl	OPEN	all	NE	lg	98	2,433,901.0	68,876.1	95	1,427,003.9	27,299.7	91	628,926.1	32,118.6
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	100	23.9	144.0						
11	Otter Trawl, Twin	OPEN	all	MA	sm	100	0.0	84.9						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	100	342,320.3	15,820.8	100	69,381.9	736.3			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: LARGE MESH GROUNDFISH

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	2	8.0	8.8				2	2.0	2.8
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	17	0.0	33.6	19	0.0	21.7	10	0.0	14.2
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	2	0.0	1.3				6	0.0	17.6
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	68	105,748.8	4,204.5	84	105,864.3	3,799.4	65	25,501.3	584.0
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	26	3,155.5	746.9	30	410.2	242.2	28	2,677.9	1,488.1
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all							9	23.0	0.0
37	Dredge, Scallop	AA	GEN	MA	all	54	0.0	22.4	33	0.0	0.8	67	0.0	13.5
38	Dredge, Scallop	AA	GEN	NE	all				75	0.0	48.3	72	26.2	449.8
39	Dredge, Scallop	AA	LIM	MA	all	45	0.0	320.0	60	0.0	115.9	56	3.3	306.3
40	Dredge, Scallop	AA	LIM	NE	all	70	192.2	9,194.1	66	130.6	12,041.4	75	46.0	7,649.8
41	Dredge, Scallop	OPEN	GEN	MA	all	80	1.0	283.3	62	44.8	343.6	65	8.5	215.0
42	Dredge, Scallop	OPEN	GEN	NE	all	97	65.2	1,668.0	100	3.8	733.8	96	30.9	1,408.3
43	Dredge, Scallop	OPEN	LIM	MA	all	94	3.6	449.7	78	0.0	149.7	67	14.2	328.4
44	Dredge, Scallop	OPEN	LIM	NE	all	96	53.9	7,009.1	100	45.1	14,196.4	90	134.1	19,926.9
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm	38	61.9	0.0	50	1,968.4	0.0	67	759.3	72.2
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all				20	1.4	0.0	23	0.0	27.3
53	Pots and Traps, Fish	OPEN	all	NE	all							11	2.6	0.0
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all	40	28.6	0.2				29	19.9	27.1
59	Pots and Traps, Lobster	OPEN	all	NE	all	54	0.9	33.7	93	125.6	293.3	45	0.4	72.1
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all	44	0.0	4.5				27	3.7	6.5
62	Beam Trawl	OPEN	all	MA	sm									

Species Group: LARGE MESH GROUNDFISH

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	22	0.0	2.8	12	0.0	0.4	31	0.0	9.4
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	70	0.0	20.4	40	0.0	14.6	17	0.0	4.7
Confidential Fleets						64	76.4	125.6	54	2,384.4	363.7	82	95,310.3	1,431.2
Total						59	3,155,140.0	186,341.0	66	1,652,014.9	78,977.0	54	797,140.5	97,720.9

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: MONKFISH (Lophius americanus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all	62	16.2	122.4	50	15.5	73.6	46	18.2	242.2
2	Longline, Bottom	OPEN	all	NE	all	4	0.0	2.0						
3	Hand Line	OPEN	all	MA	all									
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	44	20,069.9	27,532.1	48	2,649.3	3,037.4	52	11,968.6	3,507.9
6	Otter Trawl	OPEN	all	MA	lg	55	24,558.0	40,607.6	71	12,071.4	10,048.3	55	14,255.7	5,790.4
7	Otter Trawl	OPEN	all	NE	sm	55	22,699.2	13,929.5	57	7,760.8	5,252.2	46	9,263.7	6,089.1
8	Otter Trawl	OPEN	all	NE	lg	82	734,349.5	73,598.0	92	470,926.2	44,497.0	73	171,252.1	24,688.2
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	100	90.4	597.0						
11	Otter Trawl, Twin	OPEN	all	MA	sm	33	165.7	574.2						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	100	12,519.0	682.7	100	3,071.0	201.7			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: MONKFISH (Lophius americanus)

	Fleet					SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	4	165.5	42.1						
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	3	247.4	15.8	4	10.4	0.0	5	61.8	31.0
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	91	246,239.9	5,151.1				96	114,688.4	2,254.1
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	40	7,000.7	243.2	69	6,571.9	245.0	47	3,284.7	54.5
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	86	167,705.7	9,273.1	94	192,764.1	13,306.2	96	544,281.4	16,093.0
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all	96	173.8	972.8	100	301.7	445.3	100	39.0	256.0
38	Dredge, Scallop	AA	GEN	NE	all				100	171.0	638.6	68	1,079.1	10,190.1
39	Dredge, Scallop	AA	LIM	MA	all	82	779.5	13,985.1	80	144.9	6,873.5	94	1,187.7	6,769.0
40	Dredge, Scallop	AA	LIM	NE	all	95	4,143.5	173,735.4	91	8,542.9	77,056.9	97	4,609.3	80,219.6
41	Dredge, Scallop	OPEN	GEN	MA	all	98	2,930.0	9,717.4	90	2,568.9	4,281.5	98	2,665.9	6,354.7
42	Dredge, Scallop	OPEN	GEN	NE	all	84	1,243.2	7,084.5	70	195.7	1,961.3	90	1,197.8	7,924.4
43	Dredge, Scallop	OPEN	LIM	MA	all	100	1,056.3	17,739.3	100	226.5	8,813.9	100	147.4	5,480.7
44	Dredge, Scallop	OPEN	LIM	NE	all	96	4,891.3	164,335.2	83	934.1	45,118.0	94	2,993.2	125,006.6
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm									
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all									
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all	20	18.9	5.4				6	4.9	0.0
59	Pots and Traps, Lobster	OPEN	all	NE	all				7	11.2	0.0	9	0.0	3.4
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all							9	0.0	0.9
62	Beam Trawl	OPEN	all	MA	sm									

Species Group: MONKFISH (Lophius americanus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	44	319.7	1,057.9	88	363.4	1,429.6	77	162.6	1,226.5
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	70	0.0	1,372.0	90	0.0	763.5	75	0.0	2,016.0
Confidential Fleets						100	1,032.8	1,760.3	58	2,531.0	75.0	83	4,972.5	522.9
Total						56	1,252,416.1	564,136.1	75	711,831.9	224,118.5	67	888,134.0	304,721.2

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: RED DEEPSEA CRAB (Chaceon quinquedens)

						SBRM 2021			SBRM 2022			SBRM 2023		
	Fleet					% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all									
2	Longline, Bottom	OPEN	all	NE	all									
3	Hand Line	OPEN	all	MA	all									
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	0	0	1,519.0				1	0	564.9
6	Otter Trawl	OPEN	all	MA	lg							1	0	6.0
7	Otter Trawl	OPEN	all	NE	sm	1	0	61.9	2	0.0	1.8	1	0	0.1
8	Otter Trawl	OPEN	all	NE	lg	17	0	701.4	19	2.6	195.1	8	0	129.5
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg									
11	Otter Trawl, Twin	OPEN	all	MA	sm									
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg									
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									

Species Group: RED DEEPSEA CRAB (Chaceon quinquedens)

Fleet					SBRM 2021			SBRM 2022			SBRM 2023		
					% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
28	Floating Trap	OPEN	all	NE all									
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA sm									
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA lg									
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA xlg									
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE lg	5	0	11.6				1	0	0.4
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE xlg	1	0	0.3						
35	Purse Seine	OPEN	all	MA all									
36	Purse Seine	OPEN	all	NE all									
37	Dredge, Scallop	AA	GEN	MA all				33	0.0	3.6			
38	Dredge, Scallop	AA	GEN	NE all									
39	Dredge, Scallop	AA	LIM	MA all									
40	Dredge, Scallop	AA	LIM	NE all	4	0	17.5	1	0.0	1.3	1	0	6.0
41	Dredge, Scallop	OPEN	GEN	MA all				7	0.0	6.6	2	0	35.1
42	Dredge, Scallop	OPEN	GEN	NE all							1	0	0.6
43	Dredge, Scallop	OPEN	LIM	MA all				11	0.0	4.7			
44	Dredge, Scallop	OPEN	LIM	NE all	4	0	11.9	7	0.0	60.9	3	0	18.9
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE lg									
48	Trawl, Midwater	all	all	NE sm									
49	Trawl, Midwater	OPEN	all	MA sm									
50	Pots and Traps, Other	OPEN	all	MA all									
51	Pots and Traps, Other	OPEN	all	NE all									
52	Pots and Traps, Fish	OPEN	all	MA all									
53	Pots and Traps, Fish	OPEN	all	NE all									
54	Pots and Traps, Eel	OPEN	all	NE all									
55	Pots and Traps, Conch	OPEN	all	MA all									
56	Pots and Traps, Conch	OPEN	all	NE all									
57	Pots and Traps, Hagfish	OPEN	all	NE all									
58	Pots and Traps, Lobster	OPEN	all	MA all	20	359	1,919.8				12	0	19.0
59	Pots and Traps, Lobster	OPEN	all	NE all				14	0.0	5.3	5	0	4.0
60	Pots and Traps, Crab	OPEN	all	MA all									

Species Group: RED DEEPSEA CRAB (Chaceon quinquedens)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
61	Pots and Traps, Crab	OPEN	all	NE	all	100	556,832	120,128.8				100	899,457	162,102.6
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all									
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all									
Confidential Fleets									89	425,600.0	81,054.6			
Total						6	557,191	124,372.2	11	425,602.6	81,333.9	4	899,457	162,887.1

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: SEA SCALLOP (Placopecten magellanicus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all									
2	Longline, Bottom	OPEN	all	NE	all	7	1.1	1.0						
3	Hand Line	OPEN	all	MA	all									
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	12	5,846.1	10,657.4	21	216.6	329.5	12	835.8	2,435.2
6	Otter Trawl	OPEN	all	MA	lg	29	72,747.9	11,542.7	35	9,617.0	2,516.8	23	33,267.5	1,817.5
7	Otter Trawl	OPEN	all	NE	sm	11	1,342.7	933.5	8	1.0	76.4	11	1,915.0	12,856.2
8	Otter Trawl	OPEN	all	NE	lg	32	4,268.9	9,688.8	25	2,037.5	382.2	26	778.1	3,781.1
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	100	11,414.6	251.0						
11	Otter Trawl, Twin	OPEN	all	MA	sm									
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	43	96.2	7.9	33	0.0	20.0			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									

Species Group: SEA SCALLOP (Placopecten magellanicus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
28	Floating Trap	OPEN	all	NE	all									
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm									
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg									
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	16	103.0	24.6				8	13.5	1.5
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	1	4.0	0.4	2	9.5	0.0	4	3.3	0.4
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	14	39.8	95.6	10	10.3	4.1	8	53.6	12.1
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all	100	165,475.5	7,727.0	100	17,118.2	774.4	100	19,450.6	14.3
38	Dredge, Scallop	AA	GEN	NE	all				100	49,671.8	1,821.5	100	332,396.6	23,247.4
39	Dredge, Scallop	AA	LIM	MA	all	100	3,197,772.3	74,595.8	100	1,108,880.4	16,322.6	100	419,190.1	46,703.4
40	Dredge, Scallop	AA	LIM	NE	all	100	6,428,878.0	409,984.4	99	4,314,651.1	351,284.0	100	5,543,278.0	499,664.5
41	Dredge, Scallop	OPEN	GEN	MA	all	100	230,753.3	27,262.9	100	153,327.0	21,865.2	100	356,555.7	50,522.8
42	Dredge, Scallop	OPEN	GEN	NE	all	100	249,070.9	10,929.9	100	103,791.6	6,460.5	100	297,057.2	10,515.3
43	Dredge, Scallop	OPEN	LIM	MA	all	100	662,851.4	41,829.4	100	321,163.2	60,014.4	100	313,187.2	14,452.4
44	Dredge, Scallop	OPEN	LIM	NE	all	100	3,473,800.8	200,718.3	100	3,142,756.4	140,056.1	100	4,399,738.5	343,429.9
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm									
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all									
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all							6	0.0	0.2
59	Pots and Traps, Lobster	OPEN	all	NE	all									
60	Pots and Traps, Crab	OPEN	all	MA	all									

Species Group: SEA SCALLOP (Placopecten magellanicus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
61	Pots and Traps, Crab	OPEN	all	NE	all									
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	22	1,765.0	2,954.0	62	1,384.2	0.0	54	2,541.9	4,479.0
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	40	1,516.9	987.5	60	323.6	187.9	58	29.4	1,039.9
Confidential Fleets						100	19,711.4	430.3	100	6,767.4	2.0	24	1,940.9	1,290.8
Total						32	14,527,459.8	810,622.4	44	9,231,726.8	602,117.6	38	11,722,232.9	1,016,263.9

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: SKATE COMPLEX (*Rajidae*)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all	62	0.0	7,095.9	100	0.0	11,581.8	69	0.0	12,804.6
2	Longline, Bottom	OPEN	all	NE	all	93	558.6	2,053.8				75	120.0	1,372.2
3	Hand Line	OPEN	all	MA	all	8	0.0	8.0	17	0.0	10.0	36	0.0	17.0
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	89	88,096.3	491,081.8	84	782.1	138,120.4	89	53,063.6	217,157.6
6	Otter Trawl	OPEN	all	MA	lg	98	373,098.0	538,254.9	96	30,364.2	145,821.5	100	203,879.9	206,597.1
7	Otter Trawl	OPEN	all	NE	sm	88	17,730.2	159,091.9	73	10,820.8	59,236.8	81	22,723.3	129,410.0
8	Otter Trawl	OPEN	all	NE	lg	99	716,088.0	791,603.8	100	88,686.9	277,729.2	99	259,655.0	348,005.9
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	100	60.1	9,299.0						
11	Otter Trawl, Twin	OPEN	all	MA	sm	100	0.0	3,013.9						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	100	0.0	38,295.2	100	0.0	3,882.7			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									

*Species Group: SKATE COMPLEX (*Rajidae*)*

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
28	Floating Trap	OPEN	all	NE	all									
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	8	9.6	350.0	4	0.0	4.0	10	0.0	66.7
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	61	11,949.0	2,655.1	73	22.0	680.6	48	382.3	2,291.3
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	100	194,276.6	11,338.9				96	81,910.8	11,974.5
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	75	9,480.1	3,744.5	72	1,777.1	2,585.3	78	4,393.8	4,099.8
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	92	743,746.9	23,729.7	95	332,220.1	32,647.5	93	923,583.8	53,285.6
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all	100	0.0	2,017.9	100	0.0	1,143.5	100	0.0	608.4
38	Dredge, Scallop	AA	GEN	NE	all				100	0.0	2,572.3	72	0.0	17,033.6
39	Dredge, Scallop	AA	LIM	MA	all	98	0.0	33,497.9	100	11.7	24,266.7	100	0.0	37,219.6
40	Dredge, Scallop	AA	LIM	NE	all	99	0.0	190,458.4	99	0.3	248,855.0	99	0.0	217,124.9
41	Dredge, Scallop	OPEN	GEN	MA	all	100	2,093.3	29,639.4	93	3,811.7	27,760.8	100	976.3	46,256.8
42	Dredge, Scallop	OPEN	GEN	NE	all	100	0.0	28,964.3	89	0.0	6,060.7	88	2.4	18,839.8
43	Dredge, Scallop	OPEN	LIM	MA	all	100	0.0	43,397.4	100	0.0	29,744.7	100	0.0	25,759.6
44	Dredge, Scallop	OPEN	LIM	NE	all	100	1.9	187,622.1	100	0.0	274,912.9	97	0.0	255,817.3
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm							17	4,452.0	438.9
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all							8	0.0	6.1
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all	10	6.0	0.0						
59	Pots and Traps, Lobster	OPEN	all	NE	all	23	1.3	7.2						
60	Pots and Traps, Crab	OPEN	all	MA	all									

*Species Group: SKATE COMPLEX (*Rajidae*)*

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
61	Pots and Traps, Crab	OPEN	all	NE	all									
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	89	0.0	1,882.4	100	0.0	3,839.5	77	0.0	2,790.5
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	100	0.0	3,449.6	100	0.0	4,899.2	100	0.0	6,138.9
Confidential Fleets						93	1,078.8	3,551.9	92	6,992.7	5,112.0	94	1,942.3	13,855.4
Total						82	2,158,274.7	2,606,104.9	88	475,489.6	1,301,467.1	85	1,557,085.5	1,628,972.1

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: SMALL MESH GROUNDFISH

						SBRM 2021			SBRM 2022			SBRM 2023		
Fleet						**% Trips**	**Kept**	**Discarded**	**% Trips**	**Kept**	**Discarded**	**% Trips**	**Kept**	**Discarded**
1	Longline, Bottom	OPEN	all	MA	all	38	1.1	1.6	50	5.8	0.0	23	58.0	19.8
2	Longline, Bottom	OPEN	all	NE	all	7	0.0	10.4				6	0.0	54.9
3	Hand Line	OPEN	all	MA	all	8	6.9	0.0				14	8.5	1.3
4	Hand Line	OPEN	all	NE	all	8	4.8	1.0						
5	Otter Trawl	OPEN	all	MA	sm	60	176,969.2	101,790.9	45	784.9	1,256.3	62	55,534.4	8,208.8
6	Otter Trawl	OPEN	all	MA	lg	49	2,437.5	6,669.2	54	635.9	1,793.6	44	1,441.7	979.9
7	Otter Trawl	OPEN	all	NE	sm	90	465,726.7	327,985.9	79	161,823.8	118,524.0	75	213,976.2	91,247.2
8	Otter Trawl	OPEN	all	NE	lg	79	10,588.3	21,367.3	85	18,014.5	20,556.3	77	12,444.5	15,509.9
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	100	19.7	10.9						
11	Otter Trawl, Twin	OPEN	all	MA	sm	83	0.5	7,862.6						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	86	14.9	2,002.6	100	325.0	148.4			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: SMALL MESH GROUNDFISH

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm									
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	1	0.0	0.5						
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	1	3.0	0.0						
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	35	1,059.8	169.9	48	890.9	28.4	27	115.7	50.6
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	9	221.1	48.4	16	170.0	13.5	16	264.6	120.5
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all	33	552.0	0.0						
37	Dredge, Scallop	AA	GEN	MA	all	50	0.0	11.3	100	0.0	5.2	33	0.0	0.3
38	Dredge, Scallop	AA	GEN	NE	all				88	0.0	38.0	46	0.0	716.3
39	Dredge, Scallop	AA	LIM	MA	all	45	0.0	287.5	60	2.0	52.7	62	0.0	1,696.0
40	Dredge, Scallop	AA	LIM	NE	all	72	2.0	12,394.0	55	161.9	4,451.9	86	28.9	15,783.4
41	Dredge, Scallop	OPEN	GEN	MA	all	41	0.0	108.1	66	1.0	82.7	55	0.0	137.0
42	Dredge, Scallop	OPEN	GEN	NE	all	51	0.0	802.7	41	0.0	104.4	58	0.0	510.9
43	Dredge, Scallop	OPEN	LIM	MA	all	62	0.0	439.4	56	0.0	156.8	33	0.0	86.6
44	Dredge, Scallop	OPEN	LIM	NE	all	76	11.8	6,499.1	50	4.5	2,803.8	74	0.0	9,962.3
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm	46	1,073.0	0.3	50	607.0	0.9	50	556.0	0.0
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all	40	3.0	292.7	20	2.3	0.0			
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all	60	331.6	215.1				65	230.8	147.3
59	Pots and Traps, Lobster	OPEN	all	NE	all	15	0.0	2.6	43	7.0	135.2	64	68.8	390.8
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all							9	0.0	1.1
62	Beam Trawl	OPEN	all	MA	sm									

Species Group: SMALL MESH GROUNDFISH

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	11	0.0	1.2	12	0.0	0.8	23	0.0	1.7
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	10	0.0	2.1	10	0.0	0.5	8	0.0	3.5
Confidential Fleets						40	4.8	1,819.8	54	962.3	8,331.4	67	32,856.9	4,401.7
Total						50	659,031.7	490,797.1	56	184,398.8	158,484.8	54	317,585.0	150,031.8

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: SPINY DOGFISH (Squalus acanthias)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all	50	13,966.4	1,652.1	100	12,140.0	339.0	69	36,836.2	720.6
2	Longline, Bottom	OPEN	all	NE	all	100	165,452.0	8,892.1				81	60,022.0	1,958.9
3	Hand Line	OPEN	all	MA	all	17	0.0	5.6				7	0.0	21.3
4	Hand Line	OPEN	all	NE	all	84	4,621.6	77.5				68	572.2	60.9
5	Otter Trawl	OPEN	all	MA	sm	46	14,329.7	261,537.3	55	0.0	86,758.7	55	14,619.0	78,946.1
6	Otter Trawl	OPEN	all	MA	lg	44	10,089.0	111,713.6	50	308.0	33,183.6	43	3,711.0	36,412.5
7	Otter Trawl	OPEN	all	NE	sm	50	710.0	102,300.8	50	36.0	25,405.7	42	0.0	58,927.4
8	Otter Trawl	OPEN	all	NE	lg	60	5,804.8	234,759.6	63	1,992.0	110,971.1	55	294.1	88,547.9
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg									
11	Otter Trawl, Twin	OPEN	all	MA	sm	33	0.0	2,976.7						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	86	0.0	28,144.3	100	0.0	1,396.2			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: SPINY DOGFISH (Squalus acanthias)

	Fleet					SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	41	453,238.8	4,724.8	26	14,731.3	2,393.6	35	31,694.0	692.9
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	78	527,431.5	27,706.8	62	66,405.6	3,436.3	74	217,290.4	6,253.4
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	80	1,156.0	4,582.0				68	227.6	928.5
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	70	200,655.0	20,904.3	60	46,605.7	7,602.0	77	168,509.3	18,800.7
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	57	17,173.9	4,573.9	51	392.4	779.7	61	5,531.4	3,410.4
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all				67	0.0	8.0			
38	Dredge, Scallop	AA	GEN	NE	all				12	0.0	3.6	11	0.0	246.7
39	Dredge, Scallop	AA	LIM	MA	all	32	0.0	668.0	20	0.0	339.2	50	0.0	449.8
40	Dredge, Scallop	AA	LIM	NE	all	55	0.0	6,310.2	43	0.0	2,557.8	41	0.0	2,254.1
41	Dredge, Scallop	OPEN	GEN	MA	all	39	0.0	195.0	45	0.0	120.1	17	0.0	123.7
42	Dredge, Scallop	OPEN	GEN	NE	all	11	0.0	47.4	4	0.0	5.0	6	0.0	28.0
43	Dredge, Scallop	OPEN	LIM	MA	all	44	0.0	445.3	78	0.0	1,067.1	42	0.0	84.7
44	Dredge, Scallop	OPEN	LIM	NE	all	52	0.0	2,410.7	24	0.0	864.6	46	0.0	3,099.0
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm	15	456.0	3,534.4						
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all	20	0.0	15.5	20	0.0	5.2	8	0.0	8.1
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all							12	0.0	56.5
59	Pots and Traps, Lobster	OPEN	all	NE	all							5	2.8	0.0
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all	11	0.0	3.8						
62	Beam Trawl	OPEN	all	MA	sm									

Species Group: SPINY DOGFISH (Squalus acanthias)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	44	0.0	425.4	62	0.0	1,721.2	31	0.0	142.6
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	50	0.0	808.9	10	0.0	56.0	33	0.0	189.4
Confidential Fleets						43	496.0	1,086.3	56	6.7	822.6	74	0.0	13,934.3
Total						53	1,415,580.7	830,502.3	48	142,617.7	279,836.3	48	539,310.0	316,298.4

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: SQUID (Doryteuthis [Amerigo] pealeii, Illex illecebrosus) - BUTTERFISH (Peprilus triacanthus) - MACKEREL (Scomber colias, Scomber scombrus)

						SBRM 2021			SBRM 2022			SBRM 2023		
	Fleet					% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all	25	2.2	0.0						
2	Longline, Bottom	OPEN	all	NE	all									
3	Hand Line	OPEN	all	MA	all	8	1.1	0.0				7	17.5	0.0
4	Hand Line	OPEN	all	NE	all	5	8,773.4	0.0				13	5,016.5	127.0
5	Otter Trawl	OPEN	all	MA	sm	87	5,016,878.3	123,386.8	79	853,742.4	2,206.4	87	1,077,320.0	81,150.4
6	Otter Trawl	OPEN	all	MA	lg	68	3,281.9	1,887.3	60	1,569.9	854.5	56	3,764.5	1,074.0
7	Otter Trawl	OPEN	all	NE	sm	95	2,702,415.6	241,809.0	99	1,916,400.8	101,335.7	97	2,833,073.9	398,243.5
8	Otter Trawl	OPEN	all	NE	lg	69	217,346.2	6,831.5	62	464.8	2,733.4	72	4,836.9	5,262.3
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	50	4.7	0.0						
11	Otter Trawl, Twin	OPEN	all	MA	sm	100	191,709.3	15,832.0						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	71	20.0	4,063.0	100	0.0	6.2			
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									

Species Group: SQUID (Doryteuthis [Amerigo] pealeii, Illex illecebrosus) - BUTTERFISH (Peprilus triacanthus) - MACKEREL (Scomber colias, Scomber scombrus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	24	544.7	19.8	26	8.8	2.0	35	89.6	3.6
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	14	30.9	17.0	12	10.6	1.1	7	2.9	5.4
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	2	0.0	1.6				9	17.2	1.3
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	30	732.2	41.5	45	352.7	23.4	25	65.5	108.8
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	8	41.4	19.8	14	913.3	9.0	7	54.9	19.1
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all	67	868.0	0.2				36	2,304.3	0.0
37	Dredge, Scallop	AA	GEN	MA	all	33	0.0	4.4	67	0.0	1.2	67	0.0	5.1
38	Dredge, Scallop	AA	GEN	NE	all				12	0.0	0.4	3	0.0	1.4
39	Dredge, Scallop	AA	LIM	MA	all	57	11.1	150.1	90	12.8	82.9	94	67.9	242.3
40	Dredge, Scallop	AA	LIM	NE	all	59	21.1	205.0	49	14.7	207.3	57	30.6	351.7
41	Dredge, Scallop	OPEN	GEN	MA	all	44	6.5	38.2	55	1.1	42.5	59	7.2	49.4
42	Dredge, Scallop	OPEN	GEN	NE	all	13	0.0	7.7	22	3.4	3.6	21	0.0	32.2
43	Dredge, Scallop	OPEN	LIM	MA	all	56	0.0	62.9	78	34.7	71.0	83	20.7	88.0
44	Dredge, Scallop	OPEN	LIM	NE	all	60	4.7	354.5	39	0.0	56.0	71	0.0	337.5
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm	77	367,780.2	6.7	100	150,160.0	3,555.0	83	220,051.0	1.5
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all									
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all									

Species Group: SQUID (Doryteuthis [Amerigo] pealeii, Illex illecebrosus) - BUTTERFISH (Peprilus triacanthus) - MACKEREL (Scomber colias, Scomber scombrus)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
59	Pots and Traps, Lobster	OPEN	all	NE	all							5	0.0	0.5
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all									
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all							8	0.0	1.0
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all							8	0.0	2.3
Confidential Fleets						91	183,958.4	5,146.7	62	27,947.6	22,056.8	84	69,874.5	27,302.7
Total						54	8,694,431.9	399,885.7	54	2,951,637.6	133,248.4	49	4,216,615.6	514,411.0

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: SURFCLAM (Spisula solidissima) - OCEAN QUAHOG (Arctica islandica)

						SBRM 2021			SBRM 2022			SBRM 2023		
	Fleet					% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
1	Longline, Bottom	OPEN	all	MA	all									
2	Longline, Bottom	OPEN	all	NE	all									
3	Hand Line	OPEN	all	MA	all									
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	2	0.0	188.6	2	0.0	59.0	2	0	61.9
6	Otter Trawl	OPEN	all	MA	lg	9	12.1	490.7	10	0.0	63.8	12	0	451.8
7	Otter Trawl	OPEN	all	NE	sm	3	4.2	40.2	5	0.0	7.0	5	0	226.1
8	Otter Trawl	OPEN	all	NE	lg	6	17.0	101.3	3	0.0	16.7	9	0	72.5
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg									
11	Otter Trawl, Twin	OPEN	all	MA	sm	17	0.0	9.0						
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg									
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									

Species Group: SURFCLAM (Spisula solidissima) - OCEAN QUAHOG (Arctica islandica)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm									
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg									
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg									
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg									
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	1	0.0	2.0				0	0	0.7
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all	4	0.0	0.4	67	0.0	9.2			
38	Dredge, Scallop	AA	GEN	NE	all				50	0.0	423.9	8	0	10.7
39	Dredge, Scallop	AA	LIM	MA	all	20	0.0	320.4	35	0.0	157.3	69	0	745.4
40	Dredge, Scallop	AA	LIM	NE	all	15	0.0	820.7	18	6.1	1,998.6	31	0	686.4
41	Dredge, Scallop	OPEN	GEN	MA	all	5	0.0	9.6	21	0.0	63.4	26	0	909.9
42	Dredge, Scallop	OPEN	GEN	NE	all	11	0.0	39.8	11	0.0	9.7	15	0	39.8
43	Dredge, Scallop	OPEN	LIM	MA	all	12	0.0	12.0	22	0.0	7.6	33	0	39.4
44	Dredge, Scallop	OPEN	LIM	NE	all	26	0.0	7,558.3	20	0.0	896.4	37	0	3,449.7
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm									
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all									
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all	17	0.0	0.1						
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all									
59	Pots and Traps, Lobster	OPEN	all	NE	all									
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all									

Species Group: SURFCLAM (Spisula solidissima) - OCEAN QUAHOG (Arctica islandica)

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	100	815,069.5	24,516.5	100	991,628.5	2,774.2	100	1,709,144	6,690.8
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	100	1,096,018.5	7,710.7	100	2,241,767.6	6,658.5	100	2,814,933	24,899.6
Confidential Fleets						67	0.0	35.0						
Total						7	1,911,121.3	41,855.3	14	3,233,402.2	13,145.3	13	4,524,077	38,284.7

Table 10, continued. Percentage of observed trips which encountered each species group and observed catch weight (kept and discarded, live lb) on observed trips by fleet for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses. Light shading indicates confidential fleets in annual SBRM analyses. Blue shading indicates fleets with confidential observed catch information. See Table 4 for fleet stratification abbreviations.

Species Group: TILEFISH

						SBRM 2021			SBRM 2022			SBRM 2023		
Fleet						**% Trips**	**Kept**	**Discarded**	**% Trips**	**Kept**	**Discarded**	**% Trips**	**Kept**	**Discarded**
1	Longline, Bottom	OPEN	all	MA	all	88	116,977.7	501.3	100	76,260.6	105.0	100	257,064.1	382.3
2	Longline, Bottom	OPEN	all	NE	all									
3	Hand Line	OPEN	all	MA	all									
4	Hand Line	OPEN	all	NE	all									
5	Otter Trawl	OPEN	all	MA	sm	6	632.5	375.6	12	16.2	131.7	12	913.3	56.4
6	Otter Trawl	OPEN	all	MA	lg	2	30.8	4.3	23	286.6	46.5	4	85.2	28.2
7	Otter Trawl	OPEN	all	NE	sm	8	798.4	370.2	14	320.0	42.8	17	1,096.5	741.3
8	Otter Trawl	OPEN	all	NE	lg	1	3.6	14.4	3	23.2	1.6	6	116.6	20.8
9	Otter Trawl, Scallop	AA	GEN	MA	lg									
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg									
11	Otter Trawl, Twin	OPEN	all	MA	sm									
12	Otter Trawl, Twin	OPEN	all	MA	lg									
13	Otter Trawl, Twin	OPEN	all	NE	sm									
14	Otter Trawl, Ruhle	OPEN	all	MA	sm									
15	Otter Trawl, Ruhle	OPEN	all	MA	lg									
16	Otter Trawl, Ruhle	OPEN	all	NE	sm									
17	Otter Trawl, Ruhle	OPEN	all	NE	lg									
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm									
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg									
20	Otter Trawl, Shrimp	OPEN	all	MA	sm									
21	Otter Trawl, Shrimp	OPEN	all	NE	sm									
22	Otter Trawl, Other	OPEN	all	MA	sm									
23	Otter Trawl, Other	OPEN	all	MA	lg									
24	Otter Trawl, Other	OPEN	all	NE	sm									
25	Otter Trawl, Other	OPEN	all	NE	lg									
26	Haul Seine, Beach	OPEN	all	NE	all									
27	Floating Trap	OPEN	all	MA	all									
28	Floating Trap	OPEN	all	NE	all									
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	0	4.0	0.0						
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg									
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg									

Species Group: TILEFISH

Fleet						SBRM 2021			SBRM 2022			SBRM 2023		
						% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm									
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg									
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	1	5.0	0.0	5	76.0	36.0	9	160.2	126.4
35	Purse Seine	OPEN	all	MA	all									
36	Purse Seine	OPEN	all	NE	all									
37	Dredge, Scallop	AA	GEN	MA	all									
38	Dredge, Scallop	AA	GEN	NE	all									
39	Dredge, Scallop	AA	LIM	MA	all									
40	Dredge, Scallop	AA	LIM	NE	all									
41	Dredge, Scallop	OPEN	GEN	MA	all									
42	Dredge, Scallop	OPEN	GEN	NE	all									
43	Dredge, Scallop	OPEN	LIM	MA	all									
44	Dredge, Scallop	OPEN	LIM	NE	all									
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg									
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm									
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg									
48	Trawl, Midwater	all	all	NE	sm									
49	Trawl, Midwater	OPEN	all	MA	sm									
50	Pots and Traps, Other	OPEN	all	MA	all									
51	Pots and Traps, Other	OPEN	all	NE	all									
52	Pots and Traps, Fish	OPEN	all	MA	all									
53	Pots and Traps, Fish	OPEN	all	NE	all									
54	Pots and Traps, Eel	OPEN	all	NE	all									
55	Pots and Traps, Conch	OPEN	all	MA	all									
56	Pots and Traps, Conch	OPEN	all	NE	all									
57	Pots and Traps, Hagfish	OPEN	all	NE	all									
58	Pots and Traps, Lobster	OPEN	all	MA	all	20	282.8	0.0				18	34.4	2.1
59	Pots and Traps, Lobster	OPEN	all	NE	all									
60	Pots and Traps, Crab	OPEN	all	MA	all									
61	Pots and Traps, Crab	OPEN	all	NE	all									
62	Beam Trawl	OPEN	all	MA	sm									
63	Beam Trawl	OPEN	all	NE	sm									
64	Beam Trawl	OPEN	all	NE	lg									
65	Scottish Seine	OPEN	all	MA	sm									
66	Dredge, Other	OPEN	all	MA	all									
67	Dredge, Other	OPEN	all	NE	all									
68	Dredge, Mussel	OPEN	all	NE	all									

Species Group: TILEFISH

Fleet	SBRM 2021			SBRM 2022			SBRM 2023		
	% Trips	Kept	Discarded	% Trips	Kept	Discarded	% Trips	Kept	Discarded
69 Dredge, Ocean Quahog/Surfclam OPEN all MA all									
70 Dredge, Ocean Quahog/Surfclam OPEN all NE all									
Confidential Fleets				100	29.6	0.0	33	28.0	25.3
Total	4	118,734.8	1,265.8	11	77,012.2	363.6	11	259,498.3	1,382.8

Table 11. Observed encounters with turtles for Standardized Bycatch Reporting Methodology Year 2021 (July 2019 through June 2020 data). Cc = Loggerhead (*Caretta caretta*), Lk = Kemp's ridley (*Lepidochelys kempii*), Dc = Leatherback (*Dermochelys coriacea*), Cm = Green (*Chelonia mydas*), Unk = Unidentified hard-shelled species.

Gear Type	Turtle Species				
	Cc	Lk	Dc	Cm	Unk
Scallop Dredge	1	0	0	0	0
Sink Gillnet	2	0	1	1	0
Bottom Otter Trawl (includes Scallop Trawl and Twin Trawl)	5	0	0	0	1
Total	8	0	1	1	1

Table 12. Observed encounters with turtles for Standardized Bycatch Reporting Methodology Year 2022 (July 2020 through June 2021 data). Cc = Loggerhead (*Caretta caretta*), Lk = Kemp's ridley (*Lepidochelys kempii*), Dc = Leatherback (*Dermochelys coriacea*), Cm = Green (*Chelonia mydas*), Unk = Unidentified hard-shelled species.

Gear Type	Turtle Species				
	Cc	Lk	Dc	Cm	Unk
Scallop Dredge	0	0	0	0	0
Sink Gillnet	0	0	0	0	0
Bottom Otter Trawl (includes Scallop Trawl and Twin Trawl)	0	0	0	0	0
Total	0	0	0	0	0

Table 13. Observed encounters with turtles for Standardized Bycatch Reporting Methodology Year 2023 (July 2021 through June 2022 data). Cc = Loggerhead (*Caretta caretta*), Lk = Kemp's ridley (*Lepidochelys kempii*), Dc = Leatherback (*Dermochelys coriacea*), Cm = Green (*Chelonia mydas*), Unk = Unidentified hard-shelled species.

Gear Type	Turtle Species				
	Cc	Lk	Dc	Cm	Unk
Scallop Dredge	0	0	0	0	0
Sink Gillnet	0	0	0	0	1
Bottom Otter Trawl (includes Scallop Trawl and Twin Trawl)	3	1	2	0	0
Total	3	1	2	0	1

Table 14. Observed turtles in older time periods which informed sea days in either Standardized Bycatch Reporting Methodology (SBRM) years 2021, 2022, or 2023. Cc = Loggerhead (*Caretta caretta*), Lk = Kemp's ridley (*Lepidochelys kempii*), Dc = Leatherback (*Dermochelys coriacea*), Cm = Green (*Chelonia mydas*), Unk = Unidentified hard-shelled species.

Gear Type	SBRM Year	Time frame	Ref	Cc	Lk	Dc	Cm	Unk
Sink Gillnet	2021, 2022	January 2012-December 2016	Murray (2018)	27	7	2	0	8
Sink Gillnet	2023	January 2017-December 2021	Murray (2023)	8	5	2	3	3
Bottom Otter Trawl (includes Scallop Trawl and Twin Trawl)	2021, 2022, 2023	January 2014-December 2018	Murray (2020)	50	5	3	2	0

Table 15. Vessel Trip Report landings (kept, live lb), estimated discards (live lb), and associated coefficient of variation (CV) for 14 Standardized Bycatch Reporting Methodology (SBRM) species groups for SBRM 2023 (July 2021 through June 2022 data). These CVs were not used in annual SBRM sample size analyses. SBRM years 2021 and 2022 are not shown because no discard analysis conducted in those years.

	SBRM 2023		
Species Group	**Kept**	**Discarded**	**CV**
ATLANTIC HERRING *(Clupea harengus)*	10,439,016	124,874	0.514
ATLANTIC SALMON *(Salmo salar)*	0	0	
BLUEFISH *(Pomatomus saltatrix)*	648,834	96,077	0.333
FLUKE *(Paralichthys dentatus)* - SCUP *(Stenotomus chrysops)* - BLACK SEA BASS *(Centropristis striata)*	23,039,523	8,123,439	0.107
LARGE MESH GROUNDFISH	33,475,005	3,185,172	0.169
MONKFISH *(Lophius americanus)*	12,928,852	9,825,181	0.079
RED DEEPSEA CRAB *(Chaceon quinquedens)*	5,287,793	1,198,142	0.139
SEA SCALLOP *(Placopecten magellanicus)*	331,446,604	29,399,409	0.121
SKATE COMPLEX (Rajidae)	21,219,264	45,596,504	0.072
SMALL MESH GROUNDFISH	9,307,489	5,067,588	0.243
SPINY DOGFISH *(Squalus acanthias)*	9,563,207	7,513,993	0.168
SQUID *(Doryteuthis [Amerigo] pealeii, Illex illecebrosus)* - BUTTERFISH *(Peprilus triacanthus)* - MACKEREL *(Scomber colias, Scomber scombrus)*	70,593,090	10,174,149	0.181
SURFCLAM *(Spisula solidissima)* - OCEAN QUAHOG *(Arctica islandica)*	334,562,232	2,744,394	1.397
TILEFISH	1,493,650	21,697	0.337

Table 16. Vessel Trip Report landings (kept, live lb), estimated discards (live lb), and associated coefficient of variation (CV) for the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups combined, by fleet, for SBRM 2023 (July 2021 through June 2022 data). Light shading indicates confidential fleets, dark shading indicates fleets not considered, blanks indicate fleets with no observer data in annual SBRM analyses, and blue shading indicates confidential cells. These CVs were not used in annual SBRM sample size analyses. See Table 4 for fleet stratification abbreviations. SBRM years 2021 and 2022 are not shown because no discard analysis conducted in those years.

						SBRM 2023		
Fleet Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Kept	Discarded	CV
1	Longline, Bottom	OPEN	all	MA	all	1,498,688	62,743	0.428
2	Longline, Bottom	OPEN	all	NE	all	1,068,859	59,186	0.338
3	Hand Line	OPEN	all	MA	all	258,247	65,489	0.370
4	Hand Line	OPEN	all	NE	all	1,313,331	45,113	3.256
5	Otter Trawl	OPEN	all	MA	sm	28,328,639	5,929,622	0.220
6	Otter Trawl	OPEN	all	MA	lg	12,727,735	5,553,727	0.121
7	Otter Trawl	OPEN	all	NE	sm	53,669,761	17,994,277	0.118
8	Otter Trawl	OPEN	all	NE	lg	44,529,139	24,999,118	0.110
9	Otter Trawl, Scallop	AA	GEN	MA	lg			
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	86,069		
11	Otter Trawl, Twin	OPEN	all	MA	sm	765,149	745,900	0.392
12	Otter Trawl, Twin	OPEN	all	MA	lg	66,117		
13	Otter Trawl, Twin	OPEN	all	NE	sm	816,681		
14	Otter Trawl, Ruhle	OPEN	all	MA	sm			
15	Otter Trawl, Ruhle	OPEN	all	MA	lg			
16	Otter Trawl, Ruhle	OPEN	all	NE	sm	860,430	129,762	0.000
17	Otter Trawl, Ruhle	OPEN	all	NE	lg	180,520		
18	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	895,978		
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	1,186,873	317,135	0.273
20	Otter Trawl, Shrimp	OPEN	all	MA	sm	1,421		
21	Otter Trawl, Shrimp	OPEN	all	NE	sm			
22	Otter Trawl, Other	OPEN	all	MA	sm	978,397		
23	Otter Trawl, Other	OPEN	all	MA	lg	931,576		
24	Otter Trawl, Other	OPEN	all	NE	sm	869,914		
25	Otter Trawl, Other	OPEN	all	NE	lg	206,815		
26	Haul Seine, Beach	OPEN	all	NE	all	0		
27	Floating Trap	OPEN	all	MA	all			
28	Floating Trap	OPEN	all	NE	all	2,515		
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	2,146,811	45,864	0.270

						SBRM 2023		
Fleet Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Kept	Discarded	CV
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	3,515,980	155,773	0.236
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	1,962,033	150,359	0.253
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	7,841		
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	3,226,656	475,635	0.689
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	12,855,148	1,118,929	0.132
35	Purse Seine	OPEN	all	MA	all	0		
36	Purse Seine	OPEN	all	NE	all	3,083,450	0	
37	Dredge, Scallop	AA	GEN	MA	all	808,632	37,906	0.326
38	Dredge, Scallop	AA	GEN	NE	all	9,844,956	1,429,037	0.142
39	Dredge, Scallop	AA	LIM	MA	all	21,188,136	4,649,457	0.201
40	Dredge, Scallop	AA	LIM	NE	all	145,006,368	21,508,886	0.118
41	Dredge, Scallop	OPEN	GEN	MA	all	7,052,010	2,186,113	0.086
42	Dredge, Scallop	OPEN	GEN	NE	all	7,785,473	939,257	0.162
43	Dredge, Scallop	OPEN	LIM	MA	all	13,226,456	2,100,994	0.540
44	Dredge, Scallop	OPEN	LIM	NE	all	123,511,805	24,306,954	0.109
45	Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg			
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	5,654,069	950,910	0.000
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg			
48	Trawl, Midwater	all	all	NE	sm	7,340,500	1,926	0.666
49	Trawl, Midwater	OPEN	all	MA	sm			
50	Pots and Traps, Other	OPEN	all	MA	all			
51	Pots and Traps, Other	OPEN	all	NE	all			
52	Pots and Traps, Fish	OPEN	all	MA	all	690,481	79,066	0.269
53	Pots and Traps, Fish	OPEN	all	NE	all	517,123	295,054	0.281
54	Pots and Traps, Eel	OPEN	all	NE	all			
55	Pots and Traps, Conch	OPEN	all	MA	all	4,686	1,611	2.263
56	Pots and Traps, Conch	OPEN	all	NE	all	7,883	1,394	0.651
57	Pots and Traps, Hagfish	OPEN	all	NE	all			
58	Pots and Traps, Lobster	OPEN	all	MA	all	129,220	41,861	0.501
59	Pots and Traps, Lobster	OPEN	all	NE	all	788,337	1,523,211	0.720
60	Pots and Traps, Crab	OPEN	all	MA	all			
61	Pots and Traps, Crab	OPEN	all	NE	all	4,530,381	1,165,970	0.143
62	Beam Trawl	OPEN	all	MA	sm	17,500		
63	Beam Trawl	OPEN	all	NE	sm			

						SBRM 2023		
Fleet Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Kept	Discarded	CV
64	Beam Trawl	OPEN	all	NE	lg			
65	Scottish Seine	OPEN	all	MA	sm			
66	Dredge, Other	OPEN	all	MA	all	340,680		
67	Dredge, Other	OPEN	all	NE	all	2,166,533		
68	Dredge, Mussel	OPEN	all	NE	all			
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	195,314,347	1,753,719	0.385
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	139,537,844	2,248,662	1.683
Confidential Fleets						286,329		
Other Fleets						214,039		
TOTAL						864,004,559	123,070,619	0.055

Note: There was a single confidential fleet with observer data in SBRM 2023.

Table 17. Standardized Bycatch Reporting Methodology (SBRM) sea day standard (Step 5), sea days allocated (Step 12), and observed days for April-March by fleet for SBRM 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Industry-funded scallop (IFS) fleets are not shown by fleet. Totals are for all fleets (agency-funded and IFS fleets combined) and subtotals for agency-funded and IFS fleets are given. Dark gray shading indicates fleets not considered in the annual SBRM analyses. Yellow shading indicates fleets in which sea days were reduced via the prioritization process because of a shortfall in funding. Light gray shading indicates fleets with Northeast Fisheries Observer Program limitations. See Table 4 for fleet stratification abbreviations.

						SBRM 2021			SBRM 2022			SBRM 2023	
Fleet						Step 5	Step 12		Step 5	Step 12		Step 5	Step 12
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	2021 Sea Days Needed COMBINED	Sea Days Allocated for April 2021 - March 2022 (TOTAL)	Observed Days April 2021 - March 2022	2022 Sea Days Needed COMBINED	Sea Days Allocated for April 2022 - March 2023 (TOTAL)	Observed Days April 2022 - March 2023	2023 Sea Days Needed COMBINED	Sea Days Allocated for April 2023 - March 2024 (TOTAL)
1	Longline, Bottom	OPEN	all	MA	all	84	84	118	84	84	102	92	92
2	Longline, Bottom	OPEN	all	NE	all	17	17	18	17	17	19	14	14
3	Hand Line	OPEN	all	MA	all	14	14	14	14	14	35	14	14
4	Hand Line	OPEN	all	NE	all	13	13	33	13	13	54	15	15
5	Otter Trawl	OPEN	all	MA	sm	1,122	643	315	1,122	643	649	1,483	1,483
6	Otter Trawl	OPEN	all	MA	lg	753	364	256	753	364	419	487	256
7	Otter Trawl	OPEN	all	NE	sm	988	557	568	988	606	623	892	425
8	Otter Trawl	OPEN	all	NE	lg	840	474	508	840	474	516	782	276
11	Otter Trawl, Twin	OPEN	all	MA	sm	51	51	20	51	51	22	40	40
12	Otter Trawl, Twin	OPEN	all	MA	lg	6	6	0	6	6	0	40	40
13	Otter Trawl, Twin	OPEN	all	NE	sm	22	22	0	22	22	41	44	44
15	Otter Trawl, Ruhle	OPEN	all	MA	lg				15	15	0		
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	102	102	61	102	102	78	94	94
27	Floating Trap	OPEN	all	MA	all	6	0					0	0
28	Floating Trap	OPEN	all	NE	all	21	0		21	0		14	0
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	288	13	25	288	13	16	13	13
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	387	149	63	387	149	135	93	93
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	212	160	26	212	212	84	13	13
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	3	3	0	3	3	0	7	7
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	225	19	63	225	19	40	501	18
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	209	209	216	209	209	211	82	82
35	Purse Seine	OPEN	all	MA	all	6	0		6	0		13	0
36	Purse Seine	OPEN	all	NE	all	14	14	16	14	14	16	10	10
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm				33	33	20	51	51
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg							11	11
48	Trawl, Midwater Paired&Single	all	all	NE	sm	31	31	30	31	31	35	23	23
49	Trawl, Midwater Paired&Single	OPEN	all	MA	sm	13	13	0	13	13	0		
52	Pots and Traps, Fish	OPEN	all	MA	all	13	13	14	13	13	18	13	13
53	Pots and Traps, Fish	OPEN	all	NE	all	15	15	18	15	15	13	13	13
55	Pots and Traps, Conch	OPEN	all	MA	all	13	13	10	13	13	7	12	12

						SBRM 2021			SBRM 2022			SBRM 2023	
Fleet						Step 5	Step 12		Step 5	Step 12		Step 5	Step 12
Row	**Gear Type**	**Access Area**	**Trip Category**	**Region**	**Mesh Group**	**2021 Sea Days Needed COMBINED**	**Sea Days Allocated for April 2021 - March 2022 (TOTAL)**	**Observed Days April 2021 - March 2022**	**2022 Sea Days Needed COMBINED**	**Sea Days Allocated for April 2022 - March 2023 (TOTAL)**	**Observed Days April 2022 - March 2023**	**2023 Sea Days Needed COMBINED**	**Sea Days Allocated for April 2023 - March 2024 (TOTAL)**
56	Pots and Traps, Conch	OPEN	all	NE	all	12	12	12	12	12	9	12	12
57	Pots and Traps, Hagfish	OPEN	all	NE	all				95	0			
58	Pots and Traps, Lobster	OPEN	all	MA	all	20	20	35	20	20	27	20	20
59	Pots and Traps, Lobster	OPEN	all	NE	all	255	17	22	255	17	17	188	18
60	Pots and Traps, Crab	OPEN	all	MA	all	22	22	5	22	22	0		
61	Pots and Traps, Crab	OPEN	all	NE	all	79	79	105	79	79	117	105	105
62	Beam Trawl	OPEN	all	MA	sm							3	0
65	Scottish Seine	OPEN	all	MA	sm							8	0
66	Dredge, Other	OPEN	all	MA	all							16	0
68	Dredge, Mussel	OPEN	all	NE	all				9	0		9	0
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	33	33	42	33	33	40	47	47
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	428	42	46	428	42	47	19	19
2020 Fleets (corresponding 2023 3-year review row given in parenthesis, if available)													
17(15)	Otter Trawl, Ruhle	OPEN	all	MA	lg	15	15	0					
19(17)	Otter Trawl, Ruhle	OPEN	all	NE	lg	9	9	0	9	9	0		
26(27)	Floating Trap	OPEN	all	MA	all				6	0			
60(NA)	Dredge, Urchin	OPEN	all	NE	all	3	0		3	0			
Total						**7,666**			**7,803**			**6,926**	
Agency-funded fleet subtotal						6,344	3,248	2,659	6,481	3,382	3,410	5,293	3,373
Industry-funded scallop fleet subtotal (IFS fleets not shown)						1,322	1,856	1,879	1,322	2,063	2,031	1,633	1,696
TOTAL (excludes ASM days, MMPA days, and prioritized days not allocated)							**5,104**	**4,538**		**5,445**	**5,441**		**5,069**

Table 18. Average annual and 5-year pooled estimates with coefficient of variation (CV) of turtle interactions by gear type. Cc = Loggerhead (*Caretta caretta*), Lk = Kemp's ridley (*Lepidochelys kempii*), Cm = Green (*Chelonia mydas*), Dc = Leatherback (*Dermochelys coriacea*), Unk = unidentified hard-shelled species.

Gear Type	Year	Average Annual Estimate	5-Year Estimate	CV	Species	Region	Reference
Sink Gillnet	2012-2016	141	705	0.29	Cc	Mid-Atlantic and Georges Bank (combined)	Murray (2018)
Sink Gillnet	2012-2016	29	145	0.43	Lk	Mid-Atlantic and Georges Bank (combined)	Murray (2018)
Sink Gillnet	2012-2016	5	27	0.71	Dc	Mid-Atlantic and Georges Bank (combined)	Murray (2018)
Sink Gillnet	2012-2016	22	112	0.37	Unk	Mid-Atlantic and Georges Bank (combined)	Murray (2018)
Sink Gillnet	2017-2021	28	142	0.89	Cc	Mid-Atlantic and Gulf of Maine (combined)	Murray (2023)
Sink Gillnet	2017-2021	18	91	0.62	Lk	Mid-Atlantic and Gulf of Maine (combined)	Murray (2023)
Sink Gillnet	2017-2021	10	49	1.01	Cm	Mid-Atlantic and Gulf of Maine (combined)	Murray (2023)
Sink Gillnet	2017-2021	5	26	0.98	Dc	Mid-Atlantic and Gulf of Maine (combined)	Murray (2023)
Sink Gillnet	2017-2021	6	32	0.59	Unk	Mid-Atlantic and Gulf of Maine (combined)	Murray (2023)
Bottom and Scallop Otter Trawl	2014-2018	114	571	0.29	Cc	Mid-Atlantic	Murray (2020)
Bottom and Scallop Otter Trawl	2014-2018	9	46	0.45	Lk	Mid-Atlantic	Murray (2020)

Bottom and Scallop Otter Trawl	2014-2018	4	20	0.72	Dc	Mid-Atlantic	Murray (2020)
Bottom and Scallop Otter Trawl	2014-2018	3	16	0.73	Cm	Mid-Atlantic	Murray (2020)
Bottom and Scallop Otter Trawl	2014-2018	2	12	0.70	Cc	Georges Bank	Murray (2020)
Bottom and Scallop Otter Trawl	2014-2018	1	6	1.0	Dc	Georges Bank	Murray (2020)

Table 19. Estimated sea day needs/year to monitor loggerhead turtle (*Caretta caretta*) interactions to achieve a 30% coefficient of variation by Standardized Bycatch Reporting Methodology (SBRM) year.

Gear Type	Sea Days 2021	Sea Days 2022	Sea Days 2023	Reference
Sink Gillnet	887	887	0*	Murray (2018, 2023)
Bottom Otter Trawl (includes Scallop Trawl)	2,668**	2,668**	2,668**	Murray (2020)

*Sea days were not allocated for turtles in sink gillnet gear in 2023 because the rarity of turtle discards in the updated analysis caused this group to be filtered out of the SBRM sea day allocation process. See Murray (2023) for details.
**Allocated sea days for turtles were reduced to 1,922 days in 2021-2022 and 1,992 days in 2023 to account for the overlap of spatial strata when fish and sea turtle sea days were merged (NEFSC and GARFO 2021, 2022, 2023).

Table 20. Number of cells (fleet-species group) by Standardized Bycatch Reporting Methodology (SBRM) performance classification ("NOT APPLICABLE," "UNKNOWN," "MET [filtered out]," "NOT MET [filtered out]," "MET," and "NOT MET") for SBRM 2023 (July 2021 through June 2022 data). The performance classifications corresponding to the associated box number used in Figure 14 are given. CV = coefficient of variation. Erroneous fleets included in "NOT APPLICABLE." SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

	Number of cells (fleet and species group)	Box # used in Figure 14
SBRM Performance Classification	SBRM 2023	
NOT APPLICABLE: SBRM performance standard was not applicable. Variance of discard estimate was not available. Not considered in annual SBRM analysis.	336	1
UNKNOWN: SBRM performance standard was unknown. Variance of discard estimate was not used in annual sample size analysis because of no or insufficient observer coverage. Pilot coverage.	168	2, 3 ,4
MET (filtered out): SBRM performance standard was met (CV <= 30%). Variance of discard estimate was not used in annual sample size analysis because of the importance filter (filtered out). Non-pilot coverage.	260	5, 7b
NOT MET (filtered out): SBRM performance standard was not met (CV > 30%). Variance of discard estimate was not used in annual sample size analysis because of the importance filter (filtered out). Non-pilot coverage.	169	7a
MET: SBRM performance standard was met (CV <= 30%). Variance of discard estimate was used in annual sample size analysis. Non-pilot coverage.	30	9
NOT MET: SBRM performance standard was not met (CV > 30%). Variance of discard was used in annual sample size analysis. Non-pilot coverage.	17	8
Total (14 SBRM species groups x 70 fleets)	980	

Table 21. Number of fleets by Standardized Bycatch Reporting Methodology (SBRM) performance classifications and SBRM species groups for SBRM 2023 (July 2021 through June 2022 data). "NOT APPLICABLE" indicates fleets not considered in annual SBRM analyses; "UNKNOWN" indicates the coefficient of variation (CV) was unknown because of insufficient observer coverage (pilot fleets); "MET" indicates the CV was less than or equal to 30% or discard equal 0; "NOT MET" indicates the CV was greater than 30%. "FILTERED OUT" indicates non-pilot cells where the variance of the discard estimate was not used in the annual SBRM sample size analyses because of the importance filter. Erroneous fleets included in "Not Applicable." SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

Species Group	SBRM Performance Classification	SBRM 2023
ATLANTIC HERRING (*Clupea harengus*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	0
	NOT MET	0
	FILTERED OUT	34
ATLANTIC SALMON (*Salmo salar*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	0
	NOT MET	0
	FILTERED OUT	34
BLUEFISH (*Pomatomus saltatrix*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	0
	NOT MET	0
	FILTERED OUT	34
FLUKE (*Paralichthys dentatus*) - SCUP (*Stenotomus chrysops*) - BLACK SEA BASS (*Centropristis striata*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	2
	NOT MET	3
	FILTERED OUT	29
LARGE MESH GROUNDFISH	NOT APPLICABLE	24
	UNKNOWN	12
	MET	3
	NOT MET	0
	FILTERED OUT	31
MONKFISH (*Lophius americanus*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	7
	NOT MET	3
	FILTERED OUT	24

Species Group	SBRM Performance Classification	SBRM 2023
RED DEEPSEA CRAB (*Chaceon quinquedens*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	1
	NOT MET	0
	FILTERED OUT	33
SEA SCALLOP (*Placopecten magellanicus*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	2
	NOT MET	0
	FILTERED OUT	32
SKATE COMPLEX (Rajidae)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	8
	NOT MET	2
	FILTERED OUT	24
SMALL MESH GROUNDFISH	NOT APPLICABLE	24
	UNKNOWN	12
	MET	2
	NOT MET	4
	FILTERED OUT	28
SPINY DOGFISH (*Squalus acanthias*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	4
	NOT MET	4
	FILTERED OUT	26
SQUID (*Doryteuthis* [*Amerigo*] *pealeii, Illex illecebrosus*) - BUTTERFISH (*Peprilus triacanthus*) - MACKEREL (*Scomber colias, Scomber scombrus*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	1
	NOT MET	1
	FILTERED OUT	32
SURFCLAM (*Spisula solidissima*) - OCEAN QUAHOG (*Arctica islandica*)	NOT APPLICABLE	24
	UNKNOWN	12
	MET	0
	NOT MET	0
	FILTERED OUT	34
TILEFISH	NOT APPLICABLE	24
	UNKNOWN	12
	MET	0
	NOT MET	0
	FILTERED OUT	34

Table 22. Number of Standardized Bycatch Reporting Methodology (SBRM) species groups by SBRM performance classification (Unknown, Met, and Not Met) by SBRM fleets for SBRM 2023 (July 2021 through June 2022 data). Dark shading indicates fleets not considered in annual SBRM analyses ("Not Applicable"); Unk indicates the coefficient of variation (CV) was unknown because of insufficient observer coverage (pilot fleets); Met indicates the CV was less than or equal to 30% or discards equal 0; Not Met indicates the CV was greater than 30%. Filtered out indicates non-pilot cells where the variance of the discard estimate was not used in the annual SBRM sample size analyses because of the importance filter. Erroneous fleets are excluded. See Table 4 for fleet stratification abbreviations. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

Fleet						SBRM 2023			
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Unk	Not Met	Met	Filtered out
1	Longline, Bottom	OPEN	all	MA	all	0	0	0	14
2	Longline, Bottom	OPEN	all	NE	all	0	0	0	14
3	Hand Line	OPEN	all	MA	all	0	0	0	14
4	Hand Line	OPEN	all	NE	all	0	0	0	14
5	Otter Trawl	OPEN	all	MA	sm	0	5	0	9
6	Otter Trawl	OPEN	all	MA	lg	0	1	2	11
7	Otter Trawl	OPEN	all	NE	sm	0	1	5	8
8	Otter Trawl	OPEN	all	NE	lg	0	2	4	8
9	Otter Trawl, Scallop	AA	GEN	MA	lg				
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	14	0	0	0
11	Otter Trawl, Twin	OPEN	all	MA	sm	0	0	0	14
12	Otter Trawl, Twin	OPEN	all	MA	lg	14	0	0	0
13	Otter Trawl, Twin	OPEN	all	NE	sm	14	0	0	0
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	0	1	0	13
21	Otter Trawl, Shrimp	OPEN	all	NE	sm				
28	Floating Trap	OPEN	all	NE	all	14	0	0	0
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	0	0	0	14
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	0	0	1	13
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	0	0	0	14
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	14	0	0	0
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	0	1	0	13
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	0	0	2	12
35	Purse Seine	OPEN	all	MA	all	14	0	0	0
36	Purse Seine	OPEN	all	NE	all	0	0	0	14
37	Dredge, Scallop	AA	GEN	MA	all	0	0	0	14
38	Dredge, Scallop	AA	GEN	NE	all	0	0	1	13
39	Dredge, Scallop	AA	LIM	MA	all	0	2	0	12
40	Dredge, Scallop	AA	LIM	NE	all	0	0	4	10
41	Dredge, Scallop	OPEN	GEN	MA	all	0	0	2	12
42	Dredge, Scallop	OPEN	GEN	NE	all	0	0	1	13
43	Dredge, Scallop	OPEN	LIM	MA	all	0	1	1	12
44	Dredge, Scallop	OPEN	LIM	NE	all	0	1	6	7
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	14	0	0	0
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg	14	0	0	0
48	Trawl, Midwater	all	all	NE	sm	0	0	0	14
49	Trawl, Midwater	OPEN	all	MA	sm				
50	Pots and Traps, Other	OPEN	all	MA	all				
52	Pots and Traps, Fish	OPEN	all	MA	all	0	0	0	14
53	Pots and Traps, Fish	OPEN	all	NE	all	0	0	0	14
55	Pots and Traps, Conch	OPEN	all	MA	all	0	0	0	14
56	Pots and Traps, Conch	OPEN	all	NE	all	0	0	0	14
57	Pots and Traps, Hagfish	OPEN	all	NE	all				
58	Pots and Traps, Lobster	OPEN	all	MA	all	0	0	0	14
59	Pots and Traps, Lobster	OPEN	all	NE	all	0	1	0	13
60	Pots and Traps, Crab	OPEN	all	MA	all				
61	Pots and Traps, Crab	OPEN	all	NE	all	0	0	1	13
62	Beam Trawl	OPEN	all	MA	sm	14	0	0	0
65	Scottish Seine	OPEN	all	MA	sm	14	0	0	0
66	Dredge, Other	OPEN	all	MA	all	14	0	0	0
68	Dredge, Mussel	OPEN	all	NE	all	14	0	0	0
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	0	1	0	13
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	0	0	0	14
Total						420	17	30	429

Table 23. List of fleets and Standardized Bycatch Reporting Methodology (SBRM) species groups with associated coefficient of variation (CV) for which the SBRM performance classification was "Not Met" for non-pilot cells for SBRM 2023 (July 2021 through June 2022 data). See Table 4 for fleet stratification abbreviations and Table 5 for SBRM species group abbreviation. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

SBRM Year	Fleet Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Species Group	CV
2023	5	Otter Trawl	OPEN	all	MA	sm	FSB	0.348
2023	5	Otter Trawl	OPEN	all	MA	sm	SKATE	0.382
2023	5	Otter Trawl	OPEN	all	MA	sm	GFS	0.684
2023	5	Otter Trawl	OPEN	all	MA	sm	DOG	0.355
2023	5	Otter Trawl	OPEN	all	MA	sm	SBM	0.473
2023	6	Otter Trawl	OPEN	all	MA	lg	FSB	0.308
2023	7	Otter Trawl	OPEN	all	NE	sm	GFS	0.373
2023	8	Otter Trawl	OPEN	all	NE	lg	FSB	0.374
2023	8	Otter Trawl	OPEN	all	NE	lg	DOG	0.301
2023	19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	DOG	0.385
2023	33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	DOG	0.863
2023	39	Dredge, Scallop	AA	LIM	MA	all	MONK	0.301
2023	39	Dredge, Scallop	AA	LIM	MA	all	SKATE	0.345
2023	43	Dredge, Scallop	OPEN	LIM	MA	all	MONK	0.312
2023	44	Dredge, Scallop	OPEN	LIM	NE	all	GFS	0.320
2023	59	Pots and Traps, Lobster	OPEN	all	NE	all	GFS	0.766
2023	69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	MONK	0.396

*Due to a table error in Table 5 of McAfee and Wigley (2023), the CV in row 19 (large mesh NE haddock separator trawl) differs from the CV reported in the SBRM 2023 annual report.

Table 24. Standardized Bycatch Reporting Methodology (SBRM) standard trips needed to achieve a 30% coefficient of variation, Vessel Trip Report (VTR) trips, the percentage of standard trips to the VTR trips, and the determining species group, by fleet and SBRM year. "P" indicates standard trips were based on pilot coverage. Minimum pilot coverage ("MPC") indicates that all cells within the fleet were filtered out and the number of trips is based on pilot coverage to maintain coverage. Dark shading represents fleets not considered in annual analysis. Erroneous fleets are excluded. See Table 4 for fleet stratification abbreviations and Table 5 for species group abbreviations. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

Fleet						SBRM Standard Trips	VTR Trips	Percentage of SBRM Standard Trips to VTR trips	SBRM Species Group (FISH)
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	2023 SBRM	2023 SBRM	2023 SBRM	2023 SBRM
1	Longline, Bottom	OPEN	all	MA	all	12	123	10%	MPC
2	Longline, Bottom	OPEN	all	NE	all	12	294	4%	MPC
3	Hand Line	OPEN	all	MA	all	12	2,528	<1%	MPC
4	Hand Line	OPEN	all	NE	all	12	1,728	1%	MPC
5	Otter Trawl	OPEN	all	MA	sm	617	2,308	27%	GFS
6	Otter Trawl	OPEN	all	MA	lg	145	3,001	5%	FSB
7	Otter Trawl	OPEN	all	NE	sm	287	2,540	11%	GFS
8	Otter Trawl	OPEN	all	NE	lg	297	4,608	6%	FSB
9	Otter Trawl, Scallop	AA	GEN	MA	lg				
10	Otter Trawl, Scallop	OPEN	GEN	MA	lg	12	32	38%	P
11	Otter Trawl, Twin	OPEN	all	MA	sm	12	68	18%	MPC
12	Otter Trawl, Twin	OPEN	all	MA	lg	9	10	90%	P
13	Otter Trawl, Twin	OPEN	all	NE	sm	6	15	40%	P
19	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	12	57	21%	MPC/DOG
21	Otter Trawl, Shrimp	OPEN	all	NE	sm				
28	Floating Trap	OPEN	all	NE	all	13	460	3%	P
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	12	1,171	1%	MPC
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	91	1,278	7%	DOG
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	12	562	2%	MPC
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	6	6	100%	P
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	384	1,035	37%	DOG
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	61	1,950	3%	SKATE
35	Purse Seine	OPEN	all	MA	all	13	339	4%	P
36	Purse Seine	OPEN	all	NE	all	9	613	1%	MPC
37	Dredge, Scallop	AA	GEN	MA	all	6	190	3%	MPC
38	Dredge, Scallop	AA	GEN	NE	all	68	3,994	2%	MONK
39	Dredge, Scallop	AA	LIM	MA	all	16	412	4%	SKATE
40	Dredge, Scallop	AA	LIM	NE	all	41	1,568	3%	SCAL
41	Dredge, Scallop	OPEN	GEN	MA	all	14	1,427	1%	MONK

Fleet						SBRM Standard Trips	VTR Trips	Percentage of SBRM Standard Trips to VTR trips	SBRM Species Group (FISH)
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	2023 SBRM	2023 SBRM	2023 SBRM	2023 SBRM
42	Dredge, Scallop	OPEN	GEN	NE	all	60	2,090	3%	MONK
43	Dredge, Scallop	OPEN	LIM	MA	all	21	140	15%	MONK
44	Dredge, Scallop	OPEN	LIM	NE	all	76	875	9%	GFS
46	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	12	144	8%	P
47	Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg	3	10	30%	P
48	Trawl, Midwater	all	all	NE	sm	6	19	32%	MPC
49	Trawl, Midwater	OPEN	all	MA	sm				
50	Pots and Traps, Other	OPEN	all	MA	all				
52	Pots and Traps, Fish	OPEN	all	MA	all	12	988	1%	MPC
53	Pots and Traps, Fish	OPEN	all	NE	all	12	1,025	1%	MPC
55	Pots and Traps, Conch	OPEN	all	MA	all	12	561	2%	MPC
56	Pots and Traps, Conch	OPEN	all	NE	all	12	852	1%	MPC
57	Pots and Traps, Hagfish	OPEN	all	NE	all				
58	Pots and Traps, Lobster	OPEN	all	MA	all	12	957	1%	MPC
59	Pots and Traps, Lobster	OPEN	all	NE	all	143	24,993	1%	GFS
60	Pots and Traps, Crab	OPEN	all	MA	all				
61	Pots and Traps, Crab	OPEN	all	NE	all	12	73	16%	MPC/RCRAB
62	Beam Trawl	OPEN	all	MA	sm	3	57	5%	P
65	Scottish Seine	OPEN	all	MA	sm	3	4	75%	P
66	Dredge, Other	OPEN	all	MA	all	9	187	5%	P
68	Dredge, Mussel	OPEN	all	NE	all	9	67	13%	P
69	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	22	1,527	1%	MONK
70	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	12	1,252	1%	MPC
Total (excluding erroneous fleets)						2,642	68,137	4%	

Table 25. Number of unobserved (Unobs) and observed (Obs) Vessel Trip Report trips, mean trip duration (days), and mean kept weight of all species (lb, live weight) and difference of means for each metric (Diff) for fleets with 30 or more observed trips in Standardized Bycatch Reporting Methodology (SBRM) 2023 (July 2021 through June 2022 data). See Table 4 for fleet stratification abbreviations. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

Fleet							Number of Trips		Mean Trip Duration (Days)			Mean Kept Weight of All Species (lb)		
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	SBRM Year	Unobs	Obs	Unobs	Obs	Diff	Unobs	Obs	Diff
2	Longline, Bottom	OPEN	all	NE	all	2021	699	32	1.03	1.13	-0.09	4,409	4,777	-368
5	Otter Trawl	OPEN	all	MA	sm	2021	2,568	290	2.34	2.62	-0.29	12,804	16,016	-3,211
5	Otter Trawl	OPEN	all	MA	sm	2023	2,209	99	2.23	2.68	-0.45	12,459	15,074	-2,615
6	Otter Trawl	OPEN	all	MA	lg	2021	3,246	409	2.17	2.34	-0.17	3,651	3,557	95
6	Otter Trawl	OPEN	all	MA	lg	2022	3,505	82	2.27	3.45	-1.18	4,166	5,290	-1,124
6	Otter Trawl	OPEN	all	MA	lg	2023	2,819	182	2.45	2.3	0.15	4,345	4,672	-327
7	Otter Trawl	OPEN	all	NE	sm	2021	2,991	208	2.57	2.63	-0.06	19,962	18,923	1,039
7	Otter Trawl	OPEN	all	NE	sm	2022	3,032	77	2.55	3.47	-0.91	21,994	23,523	-1,529
7	Otter Trawl	OPEN	all	NE	sm	2023	2,352	188	3.07	3.49	-0.42	20,909	24,869	-3,960
8	Otter Trawl	OPEN	all	NE	lg	2021	4,343	738	2.67	2.82	-0.15	10,774	13,135	-2,361
8	Otter Trawl	OPEN	all	NE	lg	2022	4,453	630	2.58	3.77	-1.19	10,011	17,152	-7,141
8	Otter Trawl	OPEN	all	NE	lg	2023	3,496	1,112	2.46	3.15	-0.68	8,459	14,556	-6,096
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	2021	1,588	183	1.03	1.06	-0.03	2,791	3,180	-389
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	2021	1,439	127	1.04	1.06	-0.02	3,620	3,892	-271
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	2023	1,195	83	1.02	1.02	0	3,288	3,050	238
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	2021	924	92	1.1	1.29	-0.2	4,125	3,959	166
31	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	2023	514	48	1.05	1.04	0.01	3,551	3,368	183
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	2021	1,342	260	1.24	1.3	-0.06	3,188	3,022	166
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	2022	1,435	154	1.25	1.68	-0.42	3,659	2,852	808
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	2023	787	248	1.3	1.33	-0.03	3,426	2,619	807

Fleet						SBRM Year	Number of Trips		Mean Trip Duration (Days)			Mean Kept Weight of All Species (lb)		
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group		Unobs	Obs	Unobs	Obs	Diff	Unobs	Obs	Diff
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	2021	2,529	239	1.39	1.29	0.1	6,641	5,539	1,102
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	2022	2,266	101	1.25	1.38	-0.13	7,450	6,136	1,314
34	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	2023	1,600	350	1.32	1.4	-0.08	6,865	5,421	1,444
38	Dredge, Scallop	AA	GEN	NE	all	2023	3,926	68	1.33	1.62	-0.29	2,427	4,691	-2,265
39	Dredge, Scallop	AA	LIM	MA	all	2021	851	41	6.3	7.2	-0.89	99,946	127,580	-27,634
40	Dredge, Scallop	AA	LIM	NE	all	2021	1,594	105	8.18	7.96	0.22	112,642	112,714	-72
40	Dredge, Scallop	AA	LIM	NE	all	2022	1,387	77	8.74	8.82	-0.08	101,274	103,276	-2,002
40	Dredge, Scallop	AA	LIM	NE	all	2023	1,464	104	8.48	8.47	0.01	92,151	97,088	-4,937
41	Dredge, Scallop	OPEN	GEN	MA	all	2021	1,189	40	1.76	2	-0.24	5,289	7,236	-1,948
41	Dredge, Scallop	OPEN	GEN	MA	all	2022	1,726	30	1.94	2.23	-0.29	4,438	5,881	-1,443
41	Dredge, Scallop	OPEN	GEN	MA	all	2023	1,361	66	2.03	2.08	-0.05	4,880	6,226	-1,347
42	Dredge, Scallop	OPEN	GEN	NE	all	2021	3,440	61	1.42	1.89	-0.47	2,478	4,361	-1,883
42	Dredge, Scallop	OPEN	GEN	NE	all	2023	2,025	65	1.53	1.77	-0.24	3,632	6,817	-3,185
44	Dredge, Scallop	OPEN	LIM	NE	all	2021	662	51	9.43	8.98	0.45	140,914	138,605	2,309
44	Dredge, Scallop	OPEN	LIM	NE	all	2022	958	45	9.3	9.33	-0.03	125,340	127,455	-2,116
44	Dredge, Scallop	OPEN	LIM	NE	all	2023	807	68	9.56	8.69	0.87	140,414	149,970	-9,555

Table 26. The coefficient of variation (CV) of total discards for individuals stocks assessed between 2019 and 2022, as available from stock assessment reports, supporting documents, or the Northeast Fisheries Science Center Population Dynamics Branch assessment software (NEFSC PDY Stock Efficiency Initiative) for fish and invertebrates species in the Standardized Bycatch Reporting Methodology (SBRM) as well as 4 non-SBRM species. ASMFC = Atlantic States Marine Fisheries Commission; CAMS = Catch Accounting and Monitoring System; CCGM = Cape Cod/Gulf of Maine; EGB = Eastern Georges Bank; GB = Georges Bank; GM = Gulf of Maine; MAFMC = Mid-Atlantic Fishery Management Council; SNEMA = Southern New England/Mid-Atlantic. Blue-shaded values derived from CAMS data via Stock Efficiency Initiative.

Assessment/Stock – SBRM Species	Discard CV				Source
	2019	2020	2021	2022	
American plaice *(Hippoglossoides platessoides)*	0.07	0.13	0.07	0.09	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Atlantic cod, EGB *(Gadus morhua)*	1.10	0.20	0.13	0.39	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Atlantic cod, GB		0.54	0.38	0.61	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Atlantic cod, GM		0.78	0.51	0.60	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Atlantic halibut *(Hippoglossus hippoglossus)*	0.17	0.15	0.09	0.05	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Atlantic herring *(Clupea harengus)*	Total catch reported				2022 Assessment Reports; 2025 Research Track in progress
Atlantic mackerel *(Scomber scombrus)*	0.38	0.24	0.28	0.44	pers. comm. K. Curti, NEFSC
Atlantic wolffish *(Anarhichas lupus)*	0.09	0.13	0.10	1.75	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Black Sea Bass *(Centropristis striata)*			0.14	0.15	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Bluefish *(Pomatomus saltatrix)*	0.39	0.01	0.63	0.25	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Butterfish *(Peprilus triacanthus)*	0.16	0.30	0.49	0.17	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Deep Sea Red Crab *(Chaceon quinquedens)*	0.24	0.35	0.26	0.16	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Fluke *(Paralichthys dentatus)*	0.08	0.12	0.09	0.08	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Haddock, EGB *(Melanogrammus aeglefinus)*	0.13	0.28	0.10	0.26	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Haddock, GB	0.08	0.22	0.19	0.06	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Haddock, GM	0.11	0.17	0.12	0.20	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Longfin inshore squid *(Doryteuthis [Amerigo] pealeii)*	0.32	0.28	0.32	0.19	NEFSC Data Portal; 2023_DORY_UNIT_TAB.pdf; Table 5
Monkfish, Northern *(Lophius americanus)*	0.09	0.11	0.10	0.11	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Monkfish, Southern	0.10	0.13	0.09	0.07	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Northern shortfin squid *(Illex illecebrosus)*	0.23	0.11	0.28	0.22	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Ocean pout *(Zoarces americanus)*	0.21	0.54	0.12	0.18	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Ocean quahog *(Arctica islandica)*	0.60	1.05	0.85	0.77	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Pollock *(Pollachius virens)*	0.20	0.15	0.12	0.08	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Red hake, Northern *(Urophycis chuss)*		0.15	0.33	0.47	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Red hake, Southern		0.40	0.31	0.15	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Redfish *(Sebastes fasciatus)*		0.17	0.39	0.28	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Scup *(Stenotomus chrysops)*	0.07	0.30	0.15	0.09	NEFSC PDY Stock Efficiency Initiative (Sept 20, 2023)
Sea Scallops *(Placopecten magellanicus)*	0.09	Not available at this time			2025 Research Track assessment in progress
Silver hake, Northern *(Merluccius bilinearis)*		0.38	0.19	0.10	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Silver hake, Southern		0.43	0.66	0.19	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)

Assessment/Stock – SBRM Species	Discard CV				Source
	2019	2020	2021	2022	
Skate Complex (Rajidae)	Not available at this time				2023 Research Track assessment in progress
Spiny dogfish *(Squalus acanthias)*		0.10	0.09	0.08	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Surfclam *(Spisula solidissima)*	0.66	0.48	0.19	0.67	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Tilefish, Blueline *(Caulolatilus microps)*	Not available at this time				2024 Research Track assessment in progress
Tilefish, Golden *(Lopholatilus chamaeleonticeps)*	Not available at this time				2024 Research Track assessment in progress
White hake *(Urophycis tenuis)*	0.22	0.27	0.14		2022 Assessment Reports
Windowpane flounder, Northern *(Scophthalmus aquosus)*		0.27	0.15	0.14	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Windowpane flounder, Southern		0.19	0.20	0.12	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Winter flounder, GB *(Pseudopleuronectes americanus)*	0.39	0.34	0.15	0.25	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Winter flounder, GM	0.13	0.23	0.12	0.39	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Winter flounder, SNEMA	0.09	0.17	0.18	0.14	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Witch flounder *(Glyptocephalus cynoglossus)*	0.09	0.18	0.10	0.13	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Yellowtail flounder, CCGM *(Limanda ferruginea)*	0.12	0.14	0.11	0.17	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Yellowtail flounder, GB	0.32	0.56	0.28	0.23	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Yellowtail flounder, SNEMA	0.22	0.32	0.31	0.31	NEFSC PDY Stock Efficiency Initiative (Sept 12, 2023)
Assessment/Stock -- Non-SBRM Species	**Discard CV**				**Source**
	2019	**2020**	**2021**	**2022**	
Alewife *(Alosa pseudoharengus)*	0.36	0.28	0.37	0.40	ASMFC personal communication
American shad *(Alosa sapidissima)*	0.26	0.36	0.17	0.18	ASMFC personal communication
Blueback herring *(Alosa aestivalis)*	0.06	1.22	1.63	0.61	ASMFC personal communication
Horseshoe crab *(Limulus polyphemus)*	0.31	0.39	0.65		ASMFC personal communication

FIGURES

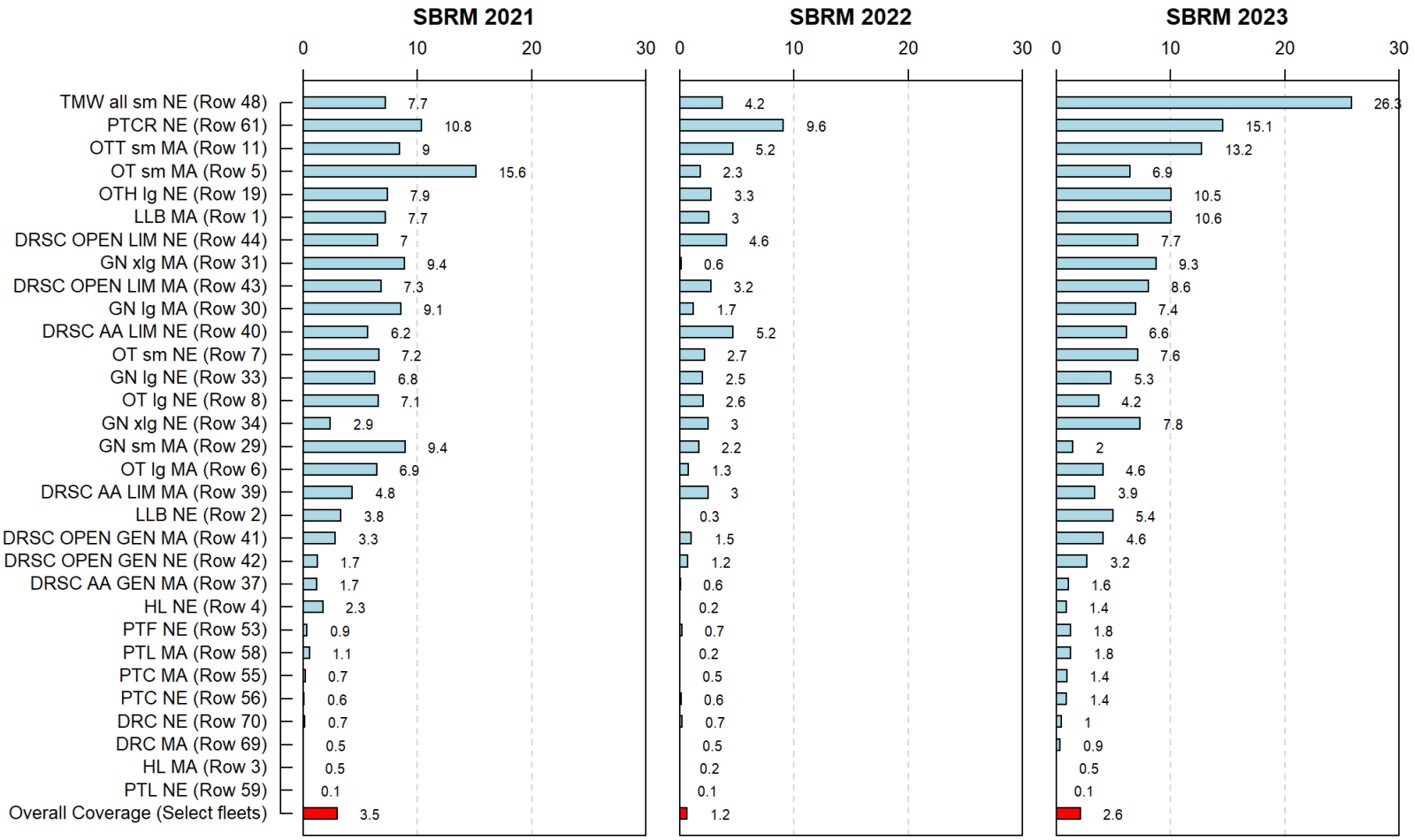


Figure 1. Percentage of Vessel Trip Report (VTR) trips observed for 31 selected fleets for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Selected fleets represent fleets for which discards were estimated in 2 of the 3 SBRM years. Bars represent the ratio of total observed trips over total VTR trips for each fleet. See Appendix Table 1 for fleet name abbreviations.

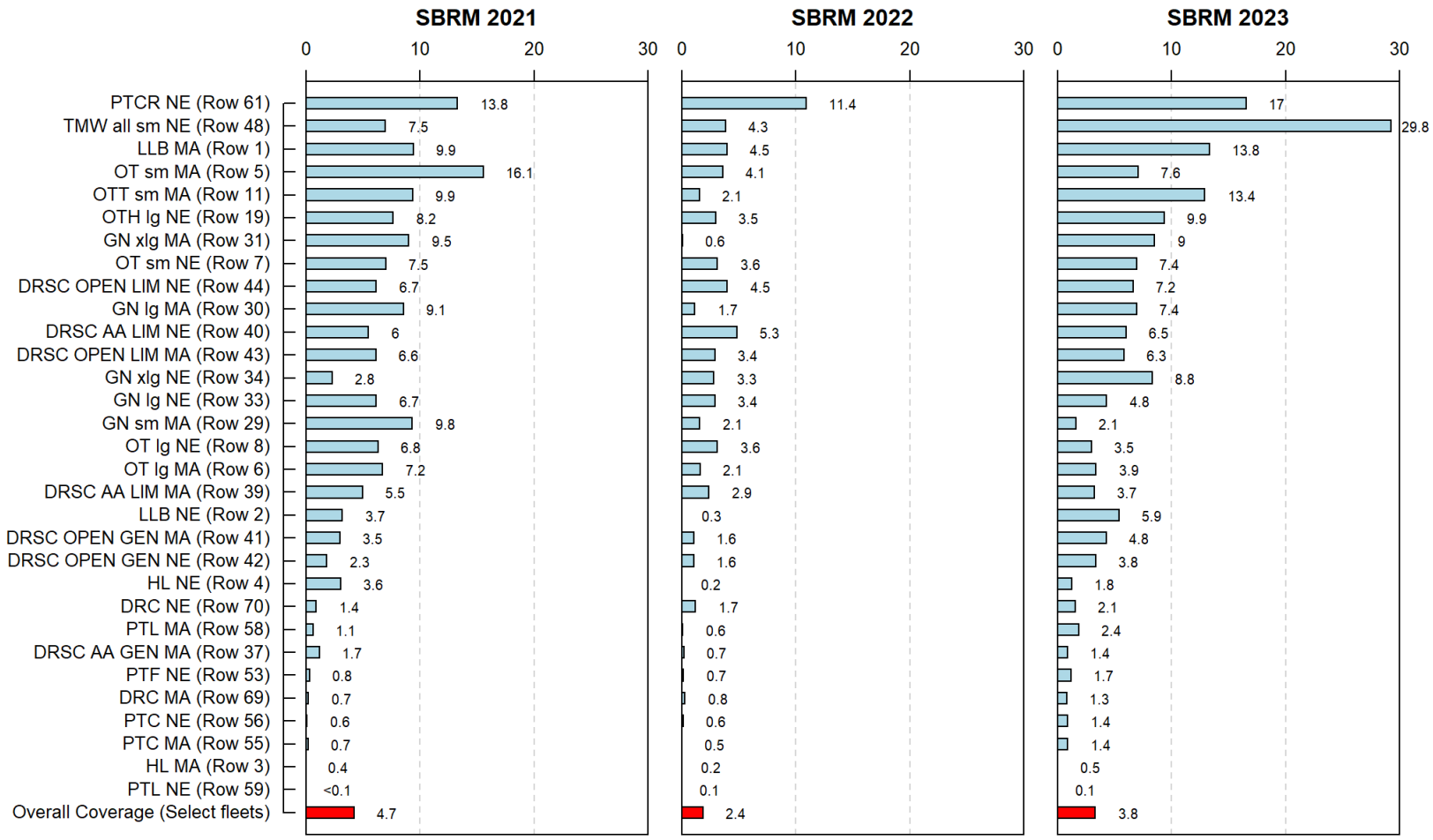


Figure 2. Percentage of Vessel Trip Report (VTR) sea days observed for 31 selected fleets for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Selected fleets represent fleets for which discards were estimated in 2 of the 3 SBRM years. Bars represent the ratio of total observed sea days over total VTR sea days for each fleet. See Appendix Table 1 for fleet name abbreviations.

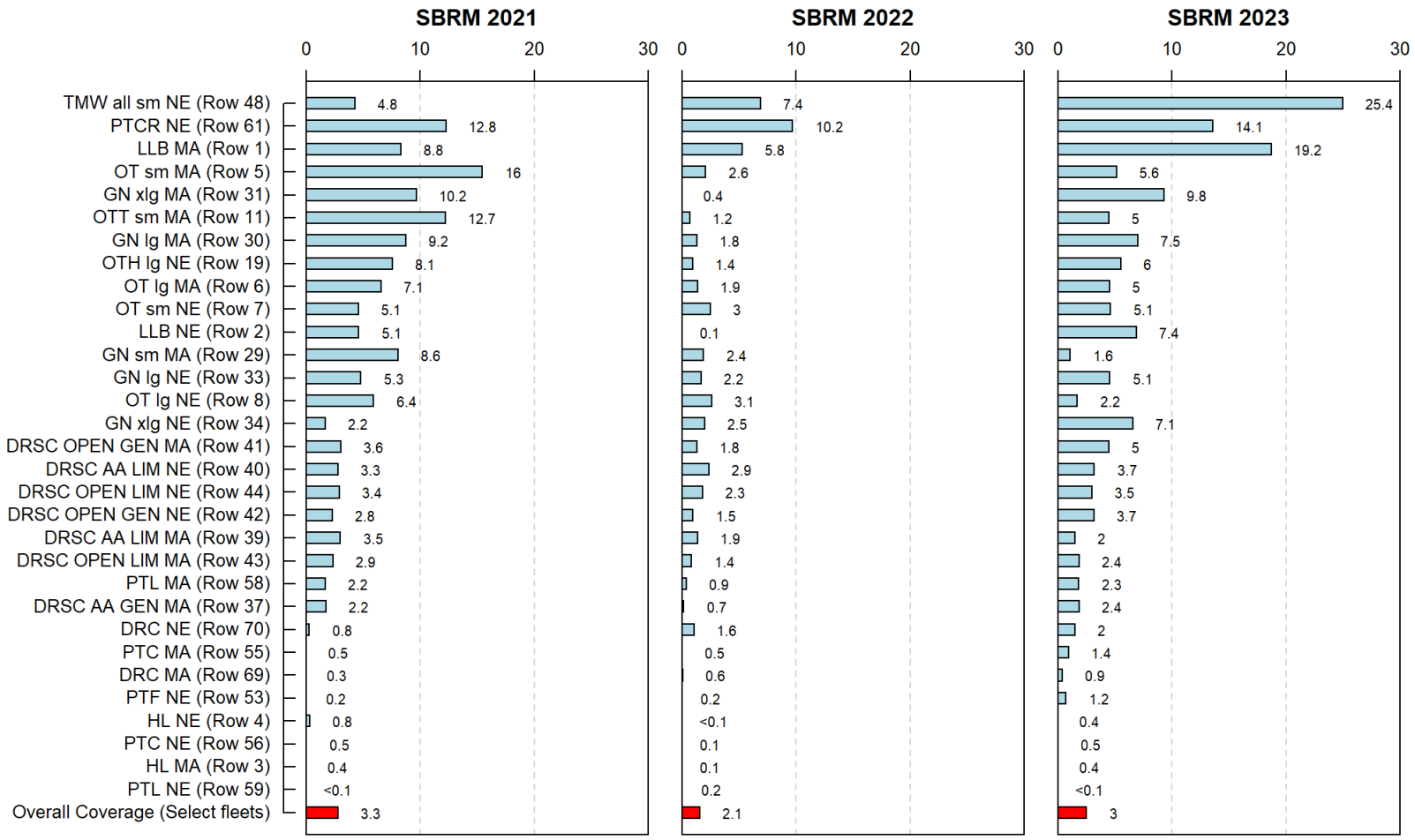


Figure 3. Percentage of Vessel Trip Report (VTR) landings observed for 31 selected fleets for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). Selected fleets represent fleets for which discards were estimated in 2 of the 3 SBRM years. Bars represent the ratio of total observed landings over the total VTR landings for each fleet. See Appendix Table 1 for fleet name abbreviations.

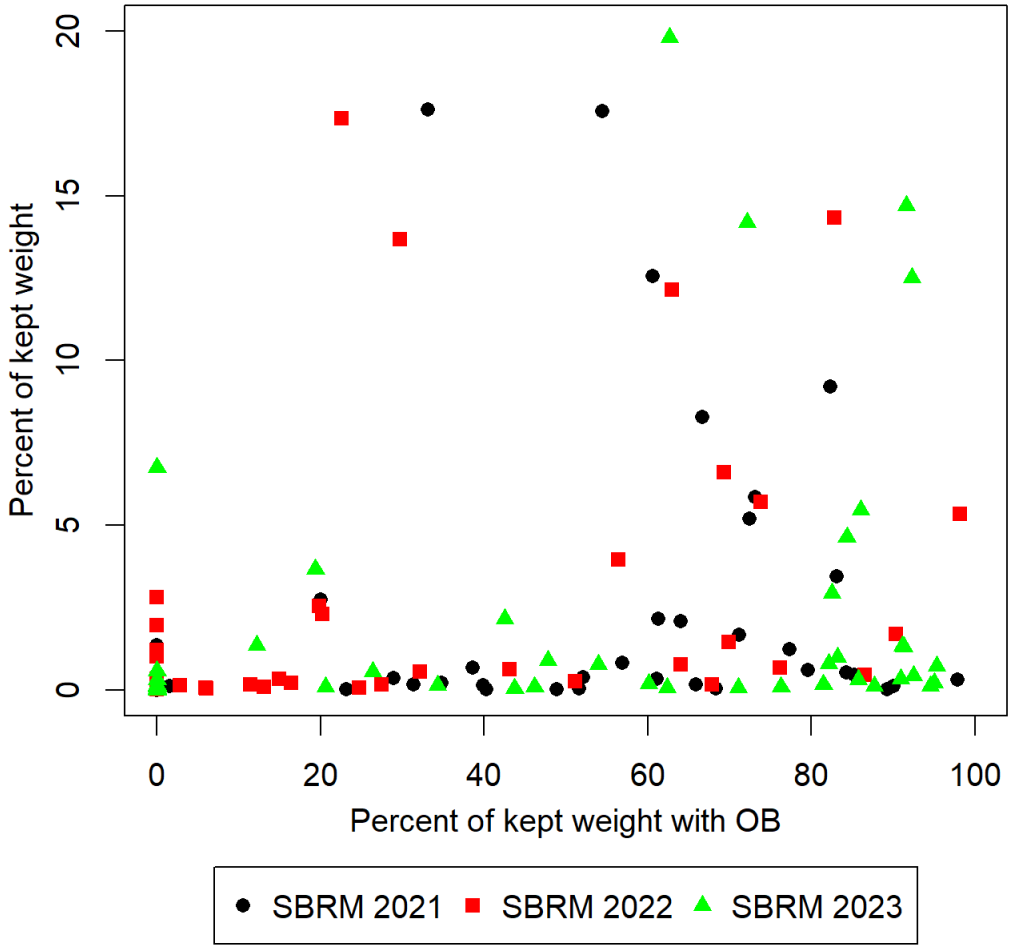


Figure 4. Percentage of Vessel Trip Report kept weight of all species with observer (OB) coverage and the percentages of kept weight of all species across all fleets, by fleet and Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data).

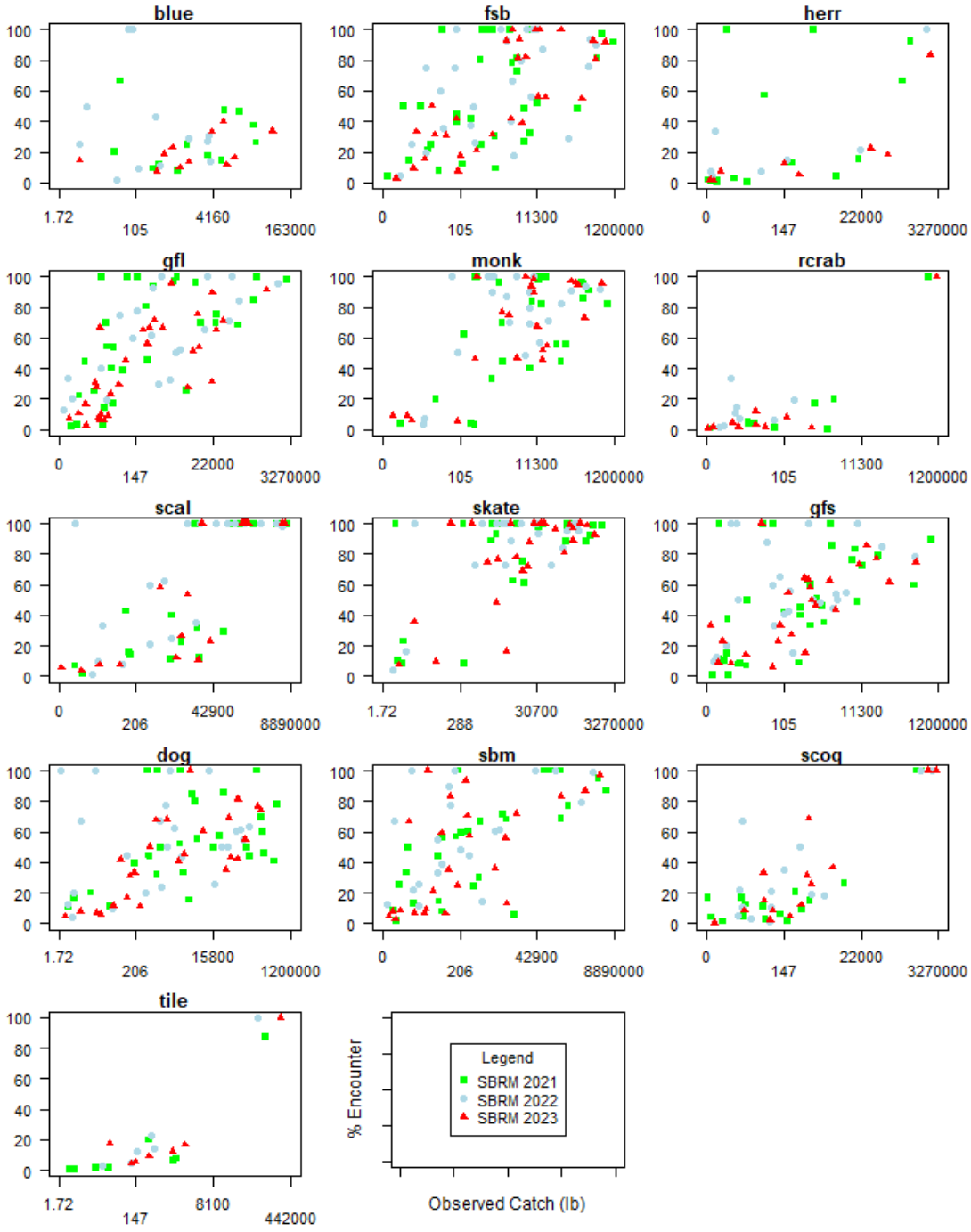


Figure 5. Percentage of observed trips, which encountered each species group and observed catch weight (kept and discarded; live weight, lb, log scale) on observed trips by Standardized Bycatch Reporting Methodology (SBRM) species group for SBRM 2021 (July 2019 through June 2020 data; green square), SBRM 2022 (July 2020 through June 2021 data; blue circle), and SBRM 2023 (July 2021 through June 2022 data; red triangle). Each symbol represents a year and fleet. See Table 5 for species group abbreviations. Note: Atlantic salmon was not encountered in July 2019 through June 2022.

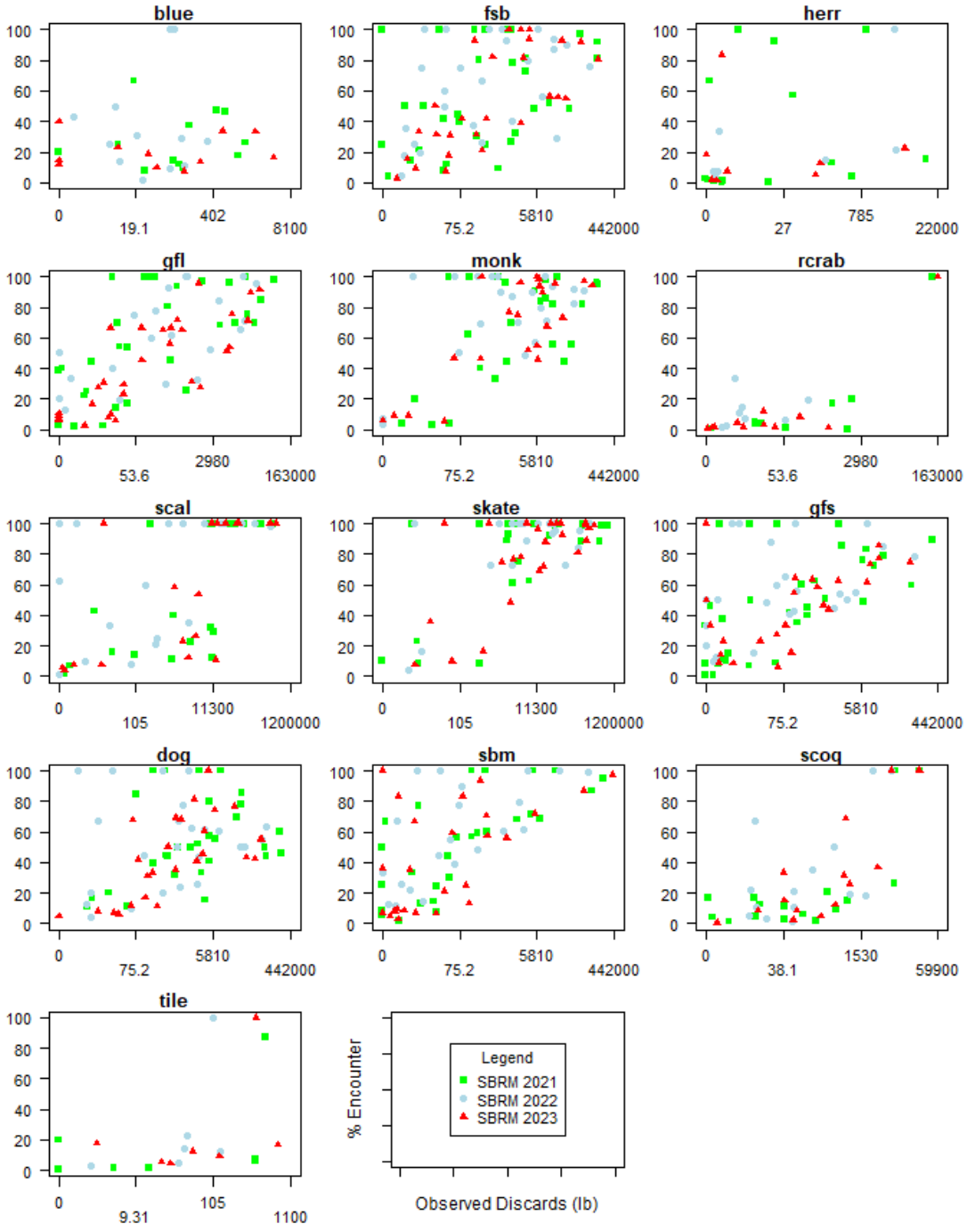


Figure 6. Percentage of observed trips which encountered each species group and observed discards weight (live weight, lb, log scale) on observed trips by Standardized Bycatch Reporting Methodology (SBRM) species group for SBRM 2021 (July 2019 through June 2020 data; green square), SBRM 2022 (July 2020 through June 2021 data; blue circle), and SBRM 2023 (July 2021 through June 2022 data; red triangle). Each symbol represents a year and fleet. See Table 5 for species group abbreviations. Note: Atlantic salmon was not encountered in July 2019 through June 2022.

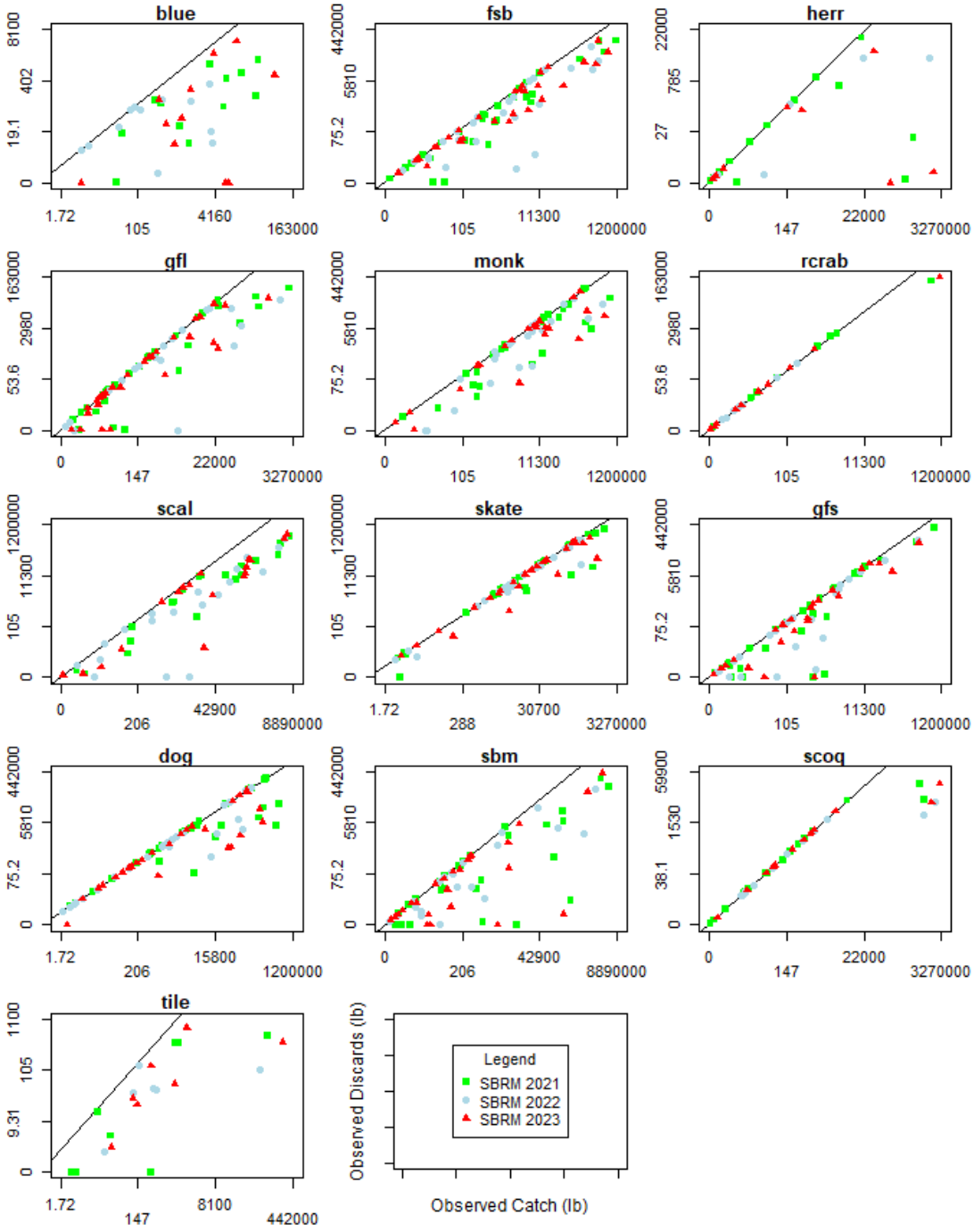


Figure 7. Observed discards (live weight, lb, log scale) and observed catch weight (kept and discard live weight, lb, log scale) on observed trips by Standardized Bycatch Reporting Methodology (SBRM) species group for SBRM 2021 (July 2019 through June 2020 data; green square), SBRM 2022 (July 2020 through June 2021 data; blue circle), and SBRM 2023 (July 2021 through June 2022 data; red triangle). Each symbol represents a year and fleet. See Table 5 for species group abbreviations. Note: Atlantic salmon was not encountered in July 2019 through June 2022.

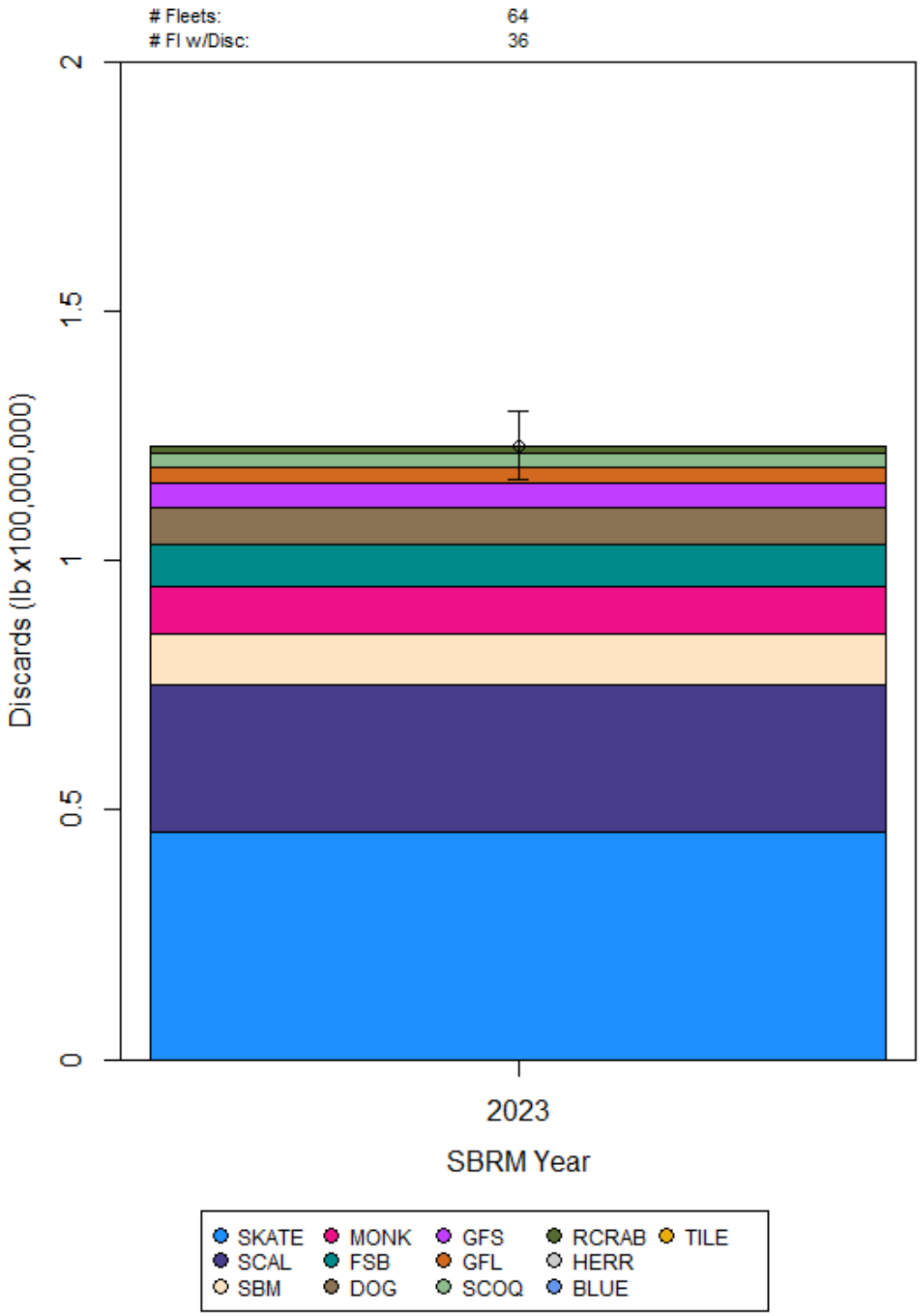


Figure 8. Estimated discards (live weight, lb) for the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups by fleet for SBRM 2023 (July 2021 through June 2022 data). One standard error of the annual total estimated discard is given. The number of fleets (# Fleets) and number of fleets with estimated discards (#Fl w/Disc) is also given. See Table 5 for species group abbreviations. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

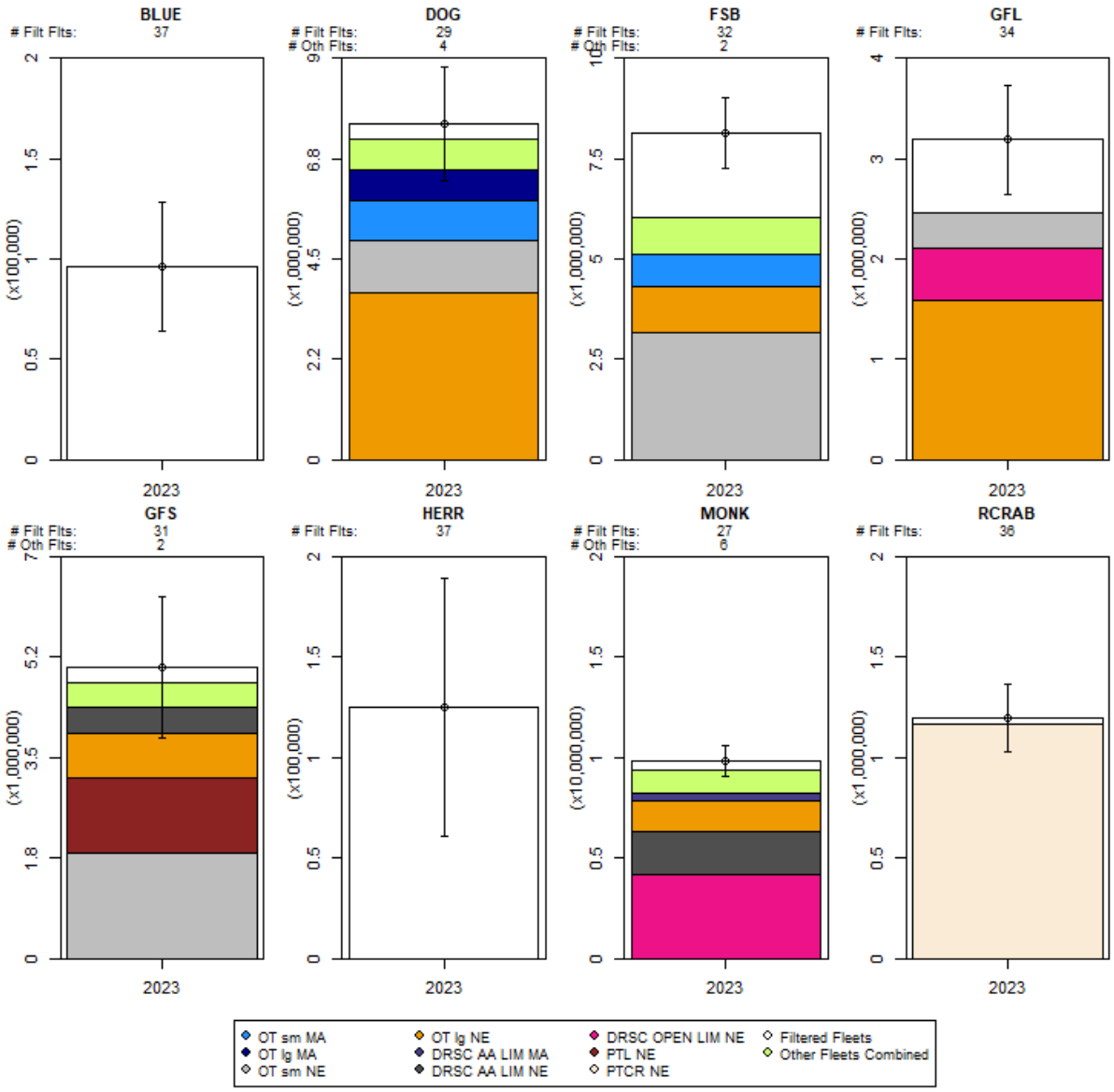


Figure 9. Estimated discards (live weight, lb) for each of the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups, by fleet, for SBRM 2023 (July 2021 through June 2022 data). One standard error of the annual total estimated discard is given. The number of fleets that have been aggregated into the group of fleets that were filtered out ("Filtered Fleets"; # Filt Flts) and the number of fleets that have been grouped into "Other Fleets Combined" (# Oth Flts; fleets that were not filtered out yet individually comprised a relatively small amount of total estimated discards) are also given. See Table 5 for species group abbreviations and Appendix Table 1 for fleet name abbreviations. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

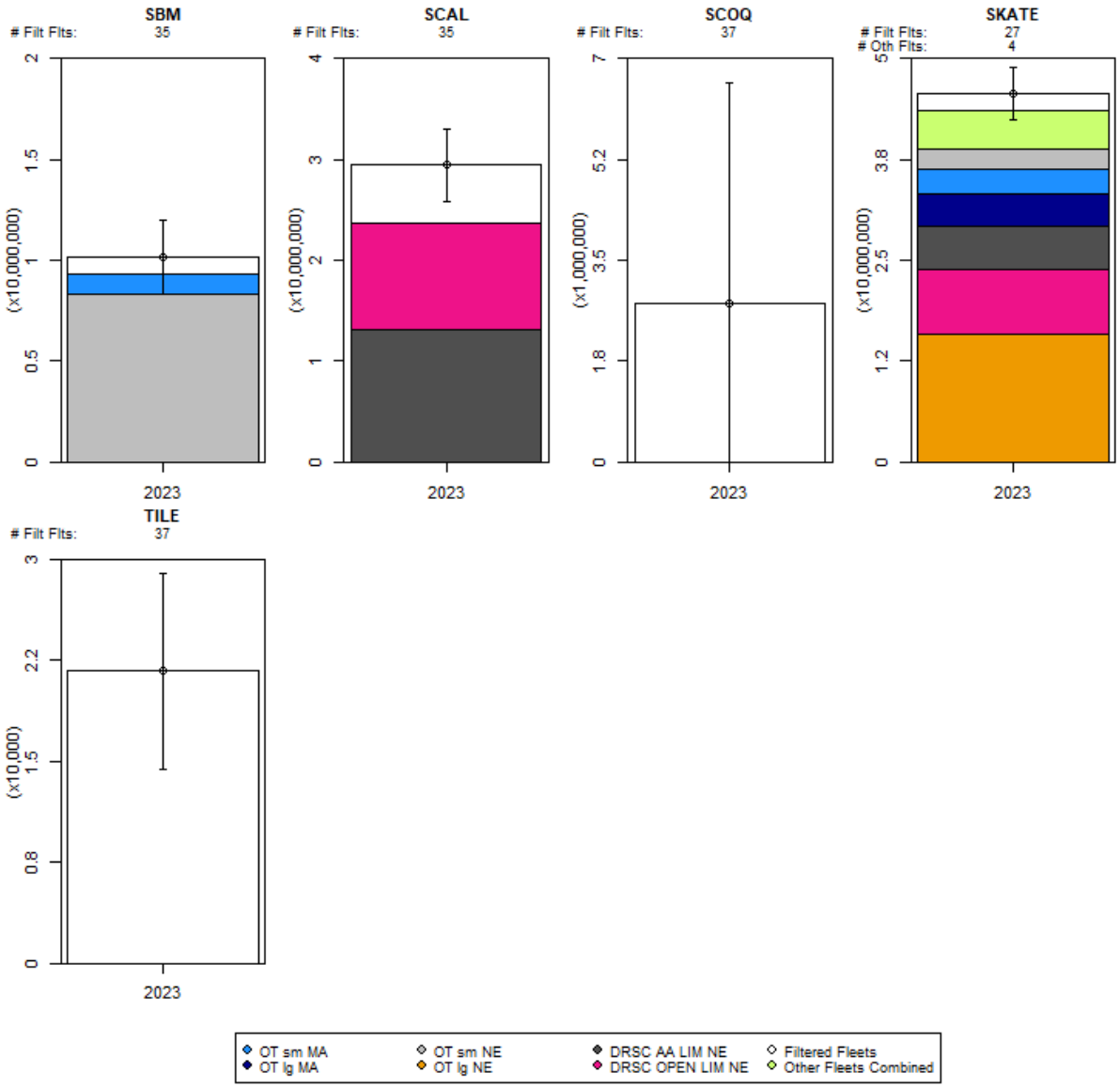


Figure 9, continued. Estimated discards (live weight, lb) for each of the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups, by fleet, for SBRM 2023 (July 2021 through June 2022 data). One standard error of the annual total estimated discard is given. The number of fleets that have been aggregated into the group of fleets that were filtered out ("Filtered Fleets"; # Filt Flts) and the number of fleets that have been grouped into "Other Fleets Combined" (# Oth Flts; fleets that were not filtered out yet individually comprised a relatively small amount of total estimated discards) are also given. See Table 5 for species group abbreviations and Appendix Table 1 for fleet name abbreviations. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

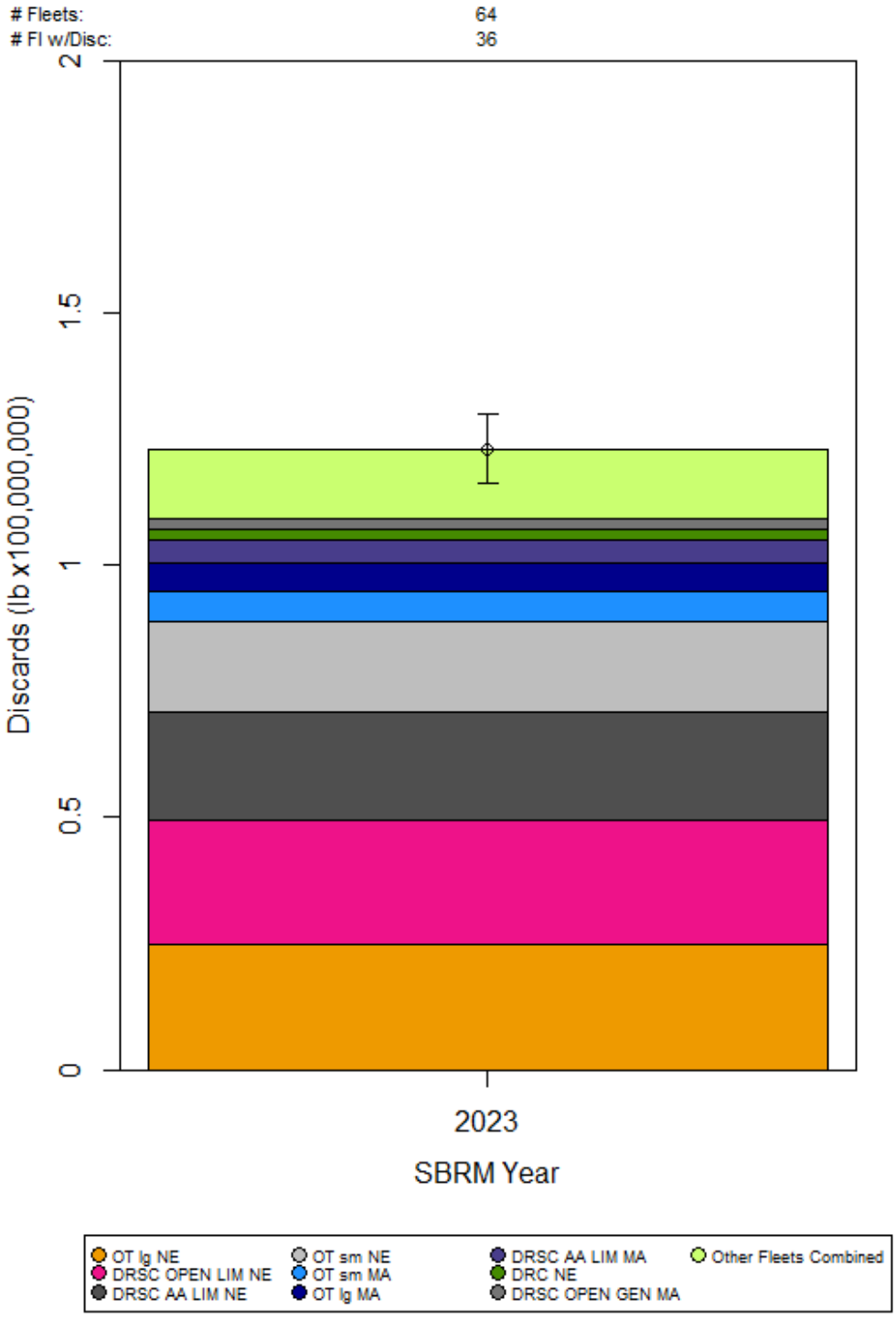


Figure 10. Estimated discards (live weight, lb) for the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups (combined) by fleet for SBRM 2023 (July 2021 through June 2022 data). Fleets that comprise a relatively small amount of total discards have been grouped in "Other Fleets Combined." One standard error of the annual total estimated discard is given. The number of fleets in the annual analysis and number of fleets with estimated discards (# F1 w/Disc) is also given. See Appendix Table 1 for fleet name abbreviations. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

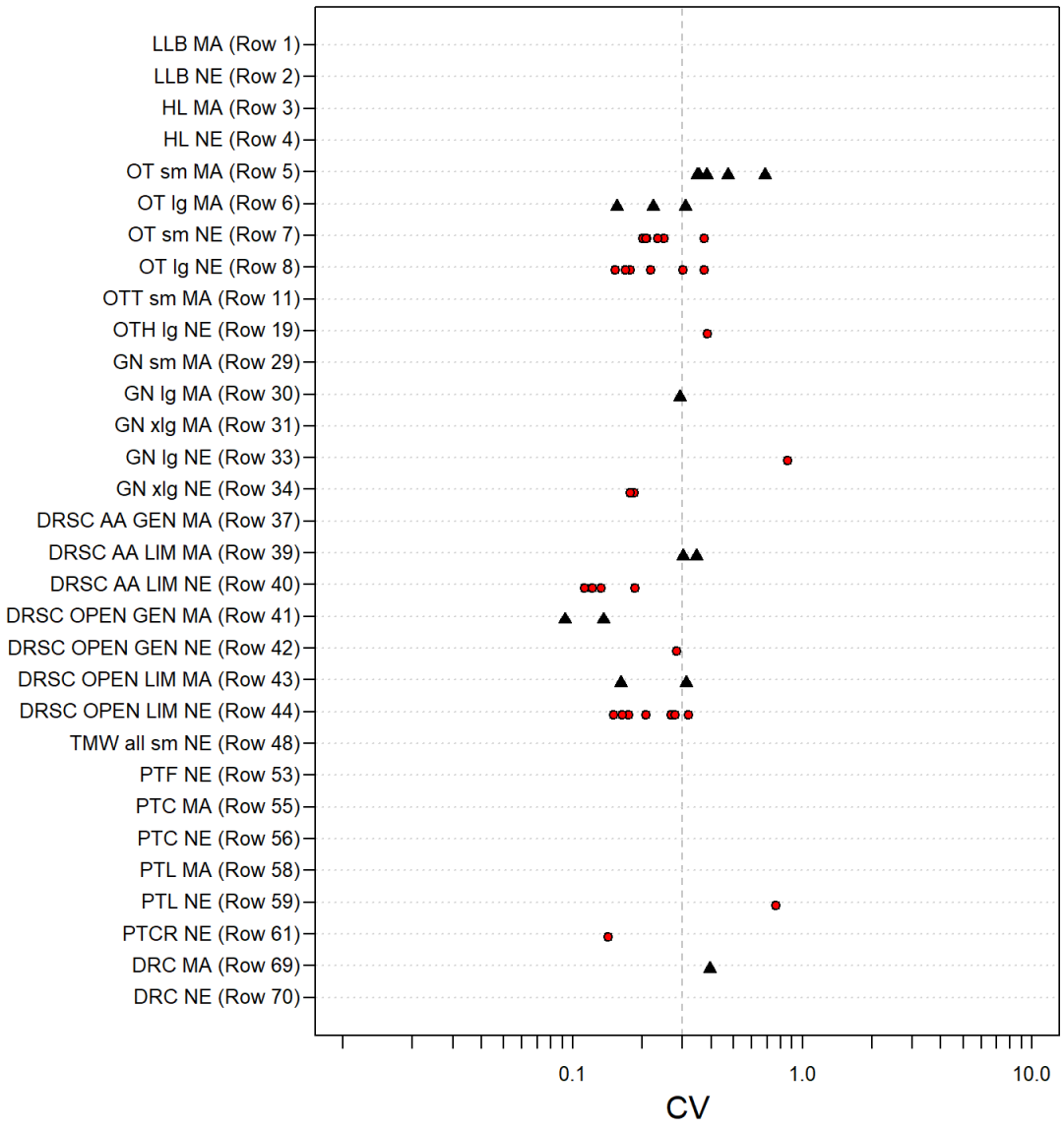


Figure 11. Precision (coefficient of variation [CV]) of estimated discards for each of the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups by selected fleet for SBRM 2023. The 31 selected fleets are: Rows 1-8, 11, 19, 29-31, 33, 34, 37, 39-44, 48, 53, 55, 56, 58, 59, 61, 69, and 70. Each point represents a separate species group and SBRM year. Red circles denote New England fleets, and black triangles denote Mid-Atlantic fleets. Dashed line represents 30% CV. Only precision of estimated discards used in the annual sample size analysis to determine the SBRM sea day standard are shown. Fleets with no symbols indicate fleets in which discards for all species groups were filtered out via the importance filter process. See Appendix Table 1 for fleet name abbreviations. See Table 23 for a listing of the fleets and species groups by SBRM year that had CV greater than 30%. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

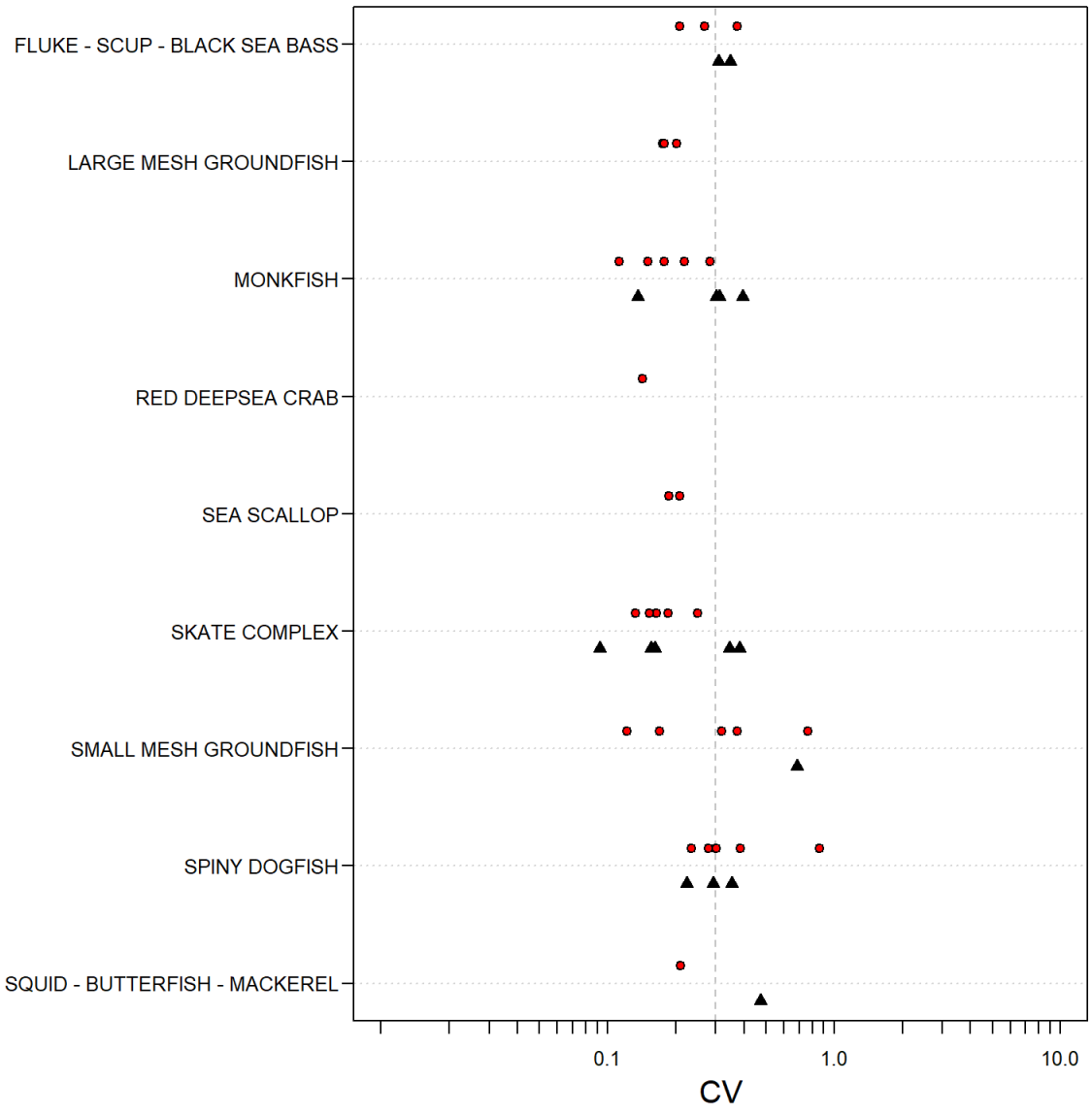


Figure 12. Precision (coefficient of variation [CV]) of estimated discards for 9 of the 14 Standardized Bycatch Reporting Methodology (SBRM) species groups by selected fleet for SBRM 2023. The 31 selected fleets are: Rows 1-8, 11, 19, 29-31, 33, 34, 37, 39-44, 48, 53, 55, 56, 58, 59, 61, 69, and 70. Each point represents a separate fleet and SBRM year. Red circles denote New England fleets, and black triangles denote Mid-Atlantic fleets. Dashed line represents 30% CV. Only precision of estimated discards for species groups used in the annual sample size analysis to determine the SBRM sea day standard are shown (9 of 14 species groups were used and are shown.) SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

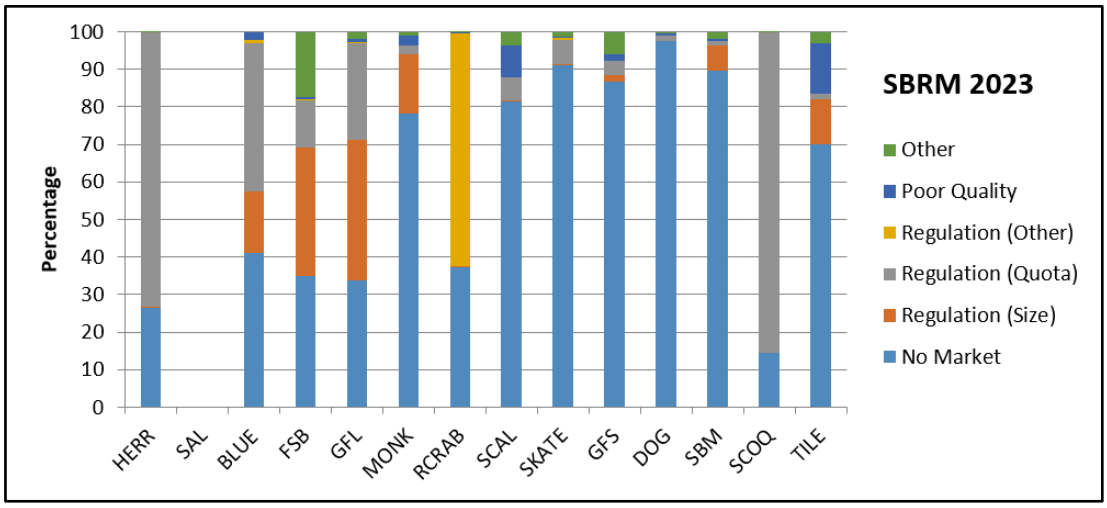


Figure 13. Percentage of discards by 6 discard reasons for 14 Standardized Bycatch Reporting Methodology (SBRM) species groups for SBRM 2023 (July 2021 through June 2022 data). See Table 5 for species group abbreviations; see Appendix Table 3 for discard reasons associated with each discard reason group. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

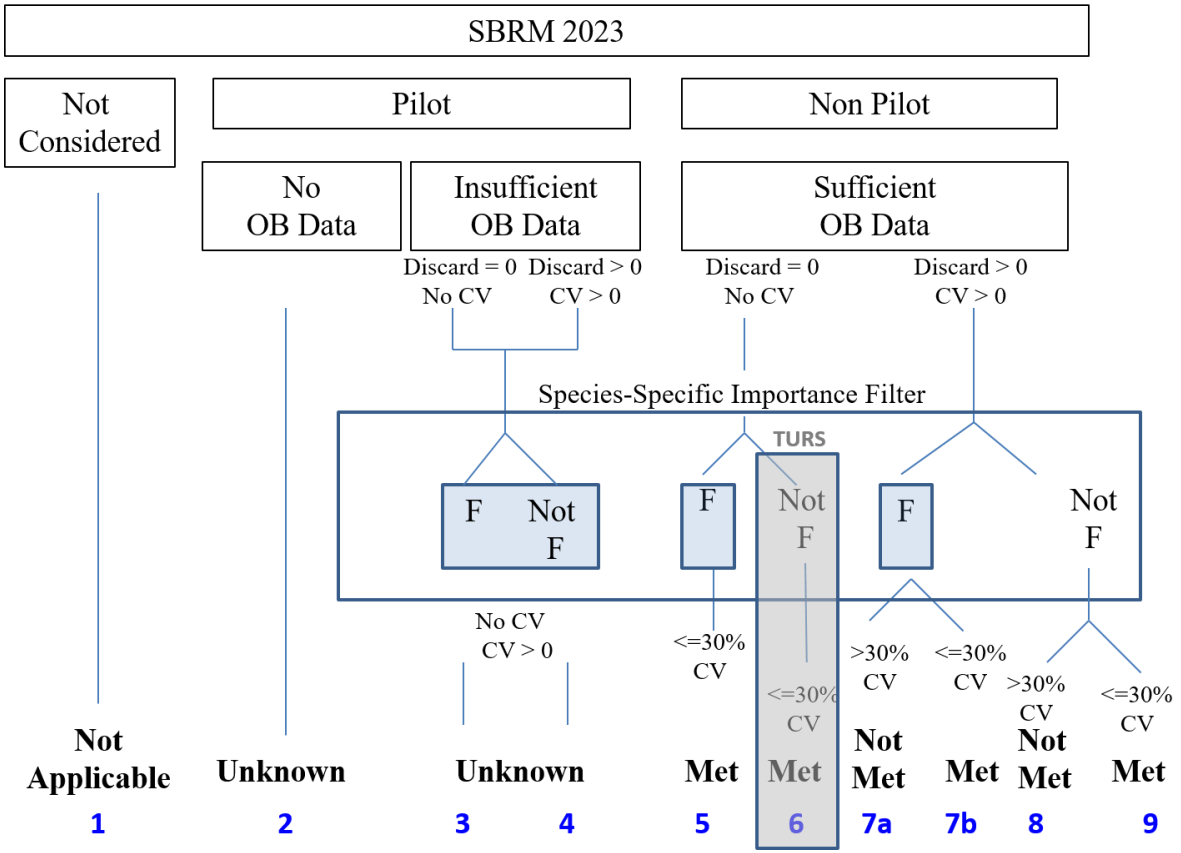


Figure 14. Standardized Bycatch Reporting Methodology (SBRM) performance classifications ("Not Applicable," "Unknown," "Not Met," and "Met") and the associated characteristics of the SBRM fleets and species groups (cells) for SBRM 2023 (July 2021 through June 2022 data). "F" represents the cells that were filtered out through the importance filter; "Not F" represents cells that were not filtered out through the importance filter. The blue-shaded boxes indicate cells that were not used in the annual sample size analysis due to pilot coverage or the importance filter (filtered out); "OB" represents observer data; "CV" represents coefficient of variation. The blue numbers correspond to the SBRM performance classification boxes presented in Table 20. Box 6 is no longer used because turtles (TURS) are not filtered via fish analyses. SBRM years 2021 and 2022 not shown due to no discard analysis in those years.

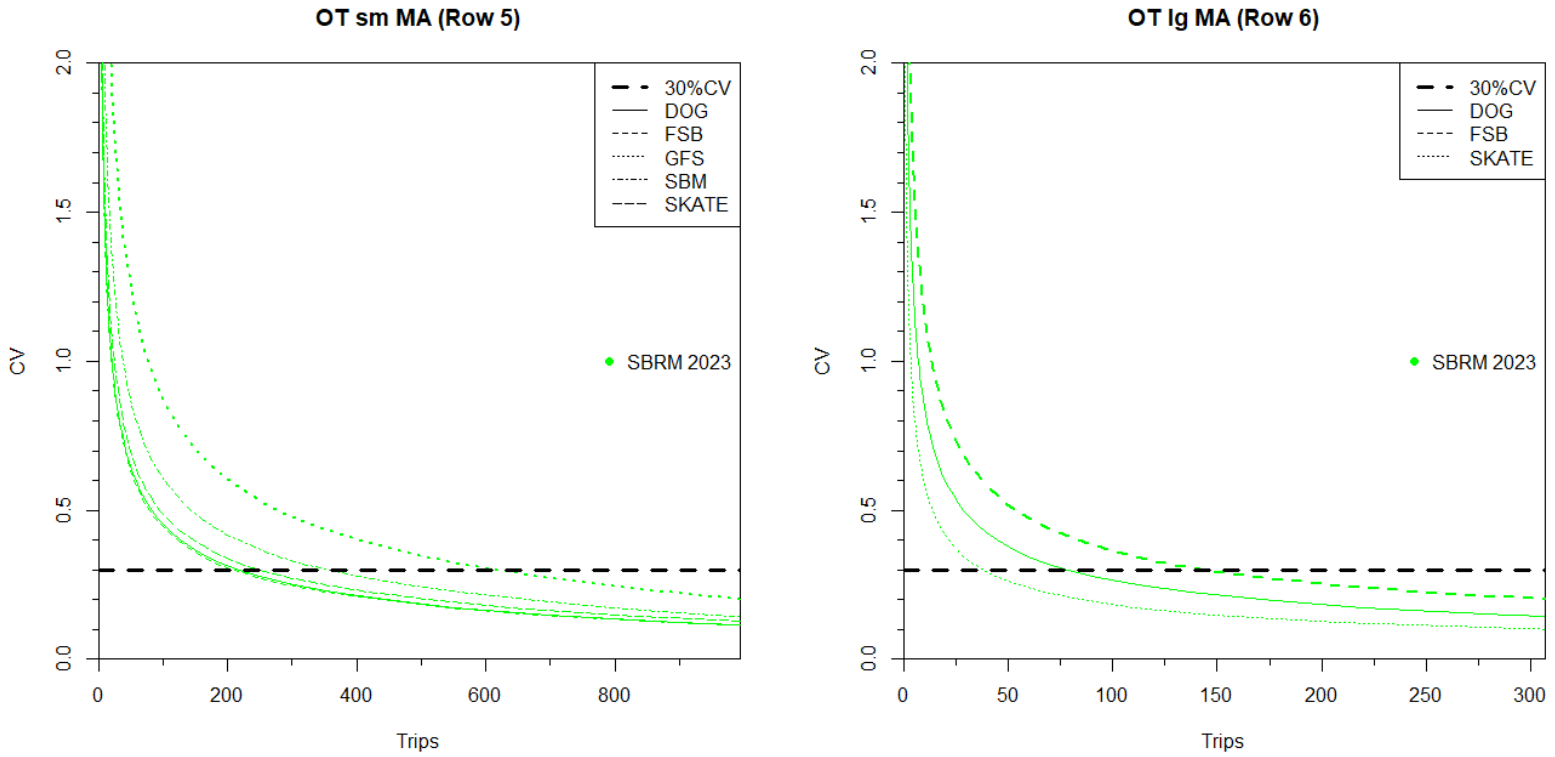


Figure 15. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

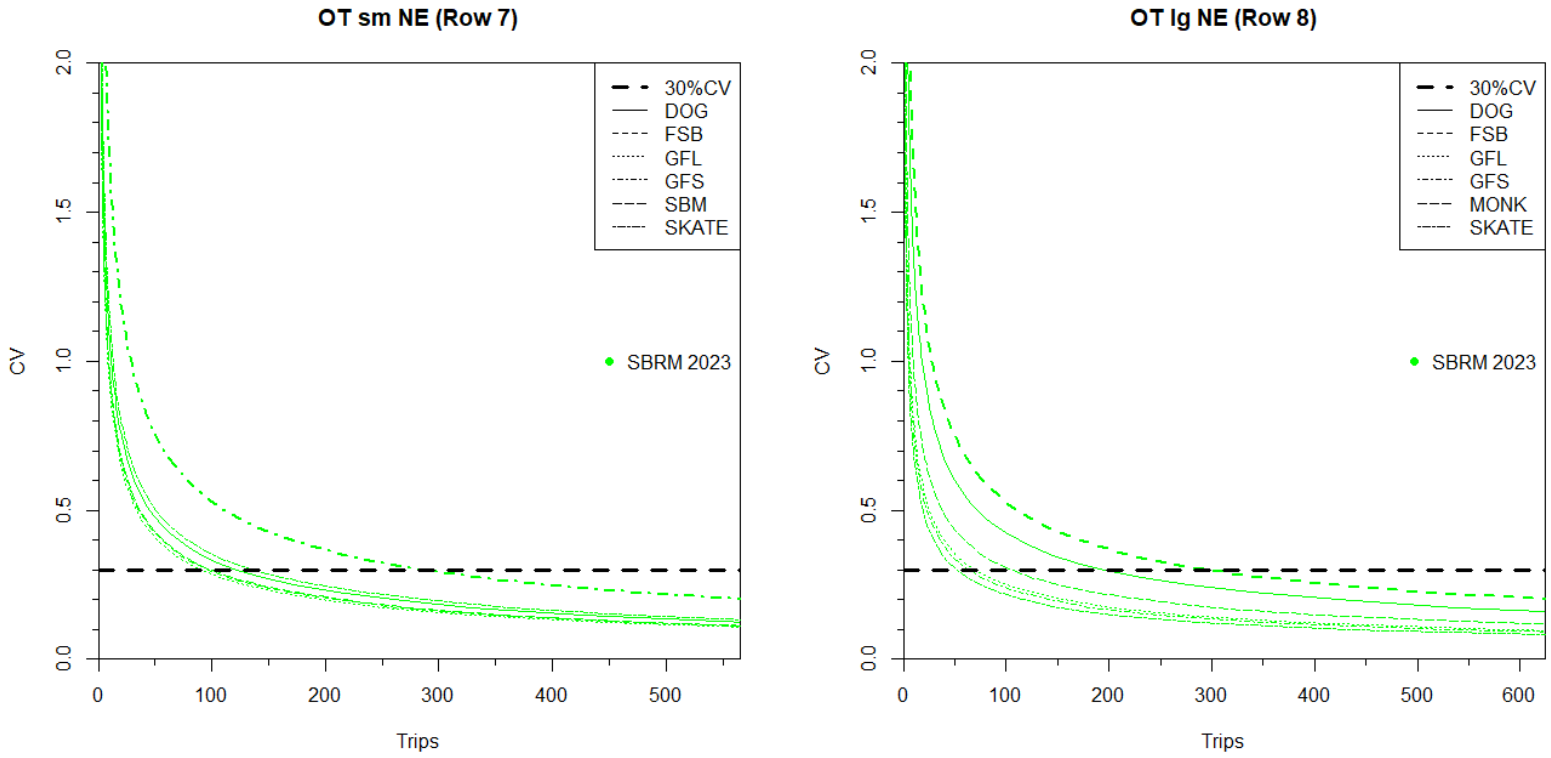


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

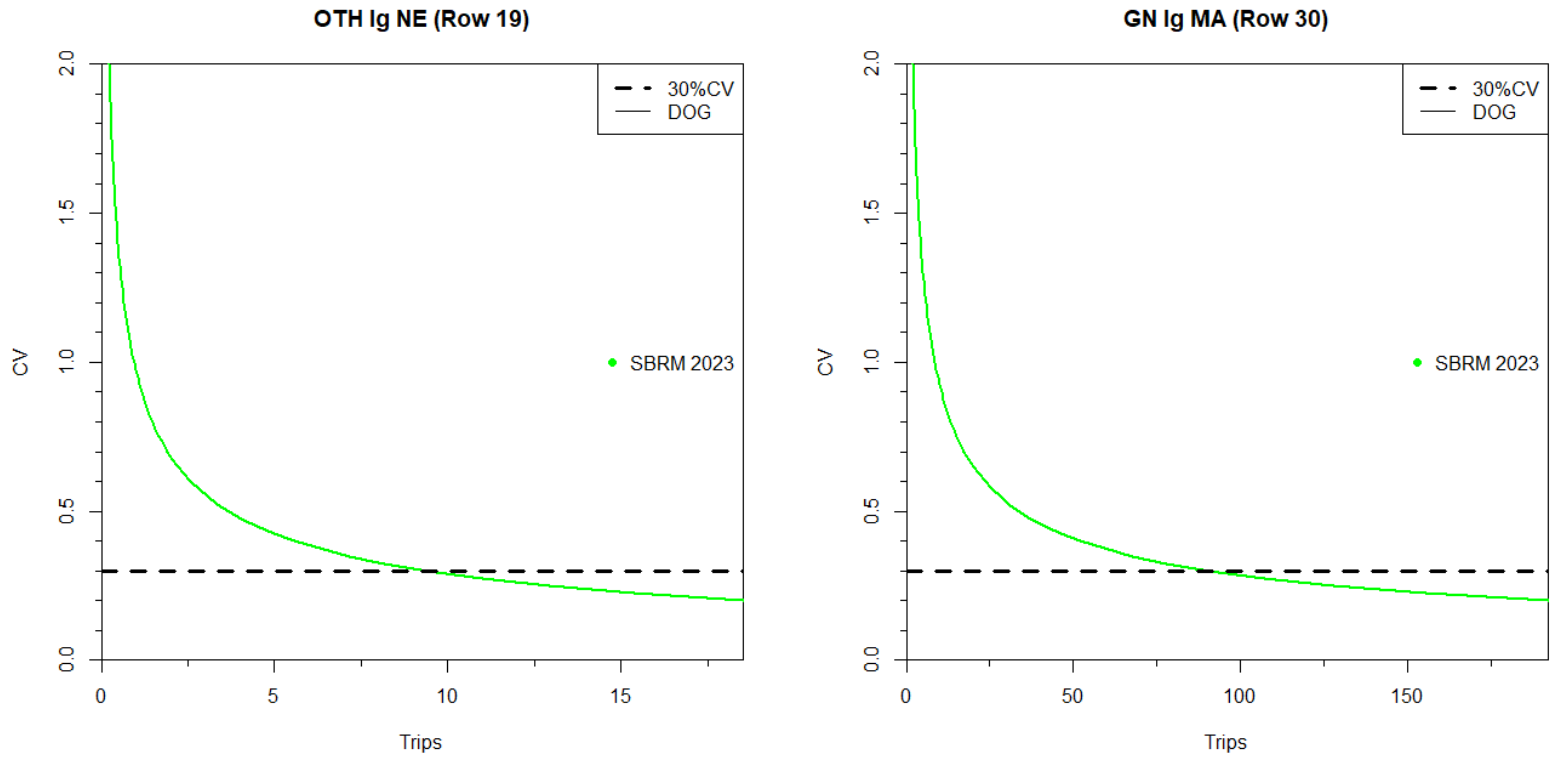


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

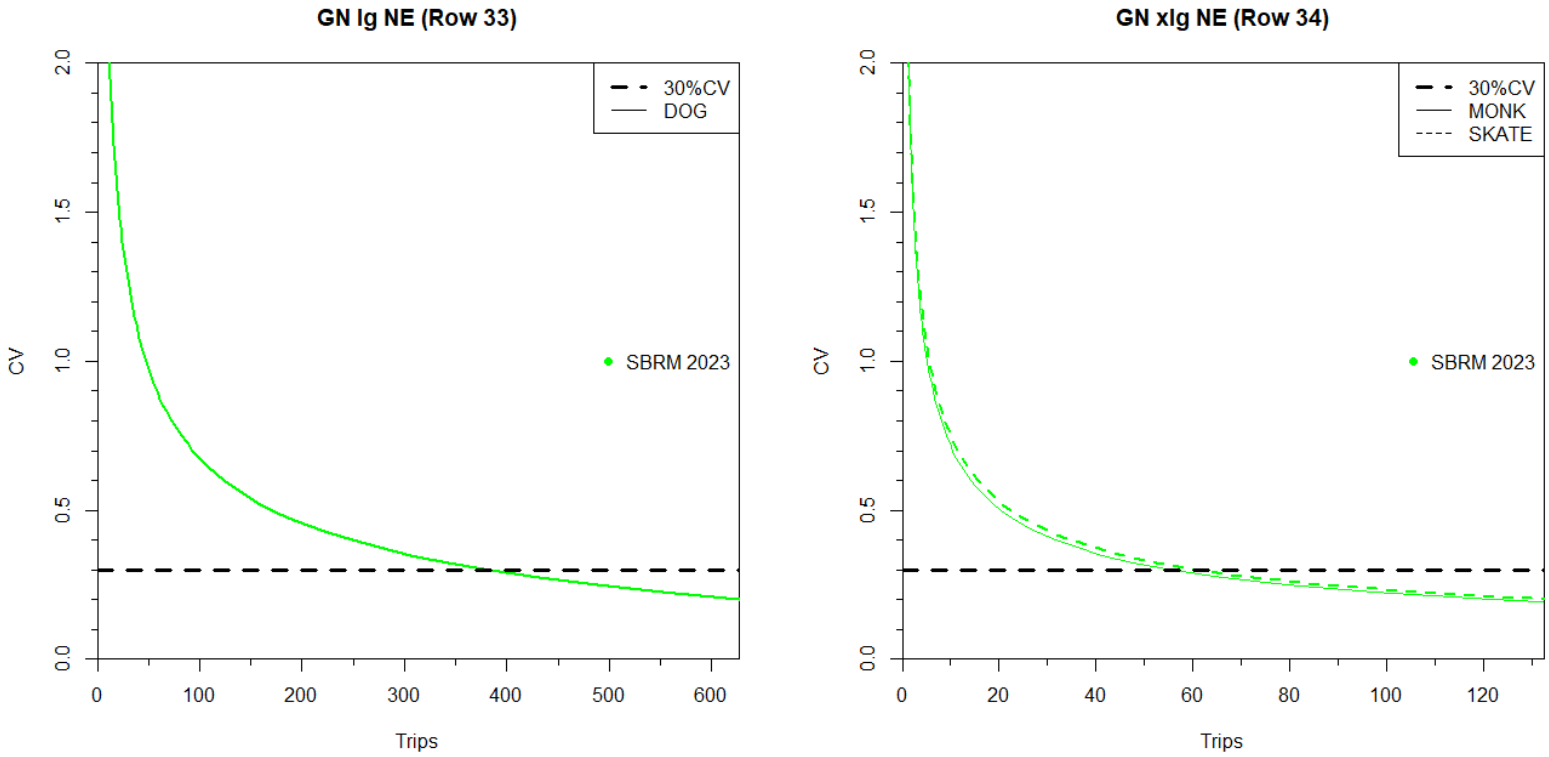


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

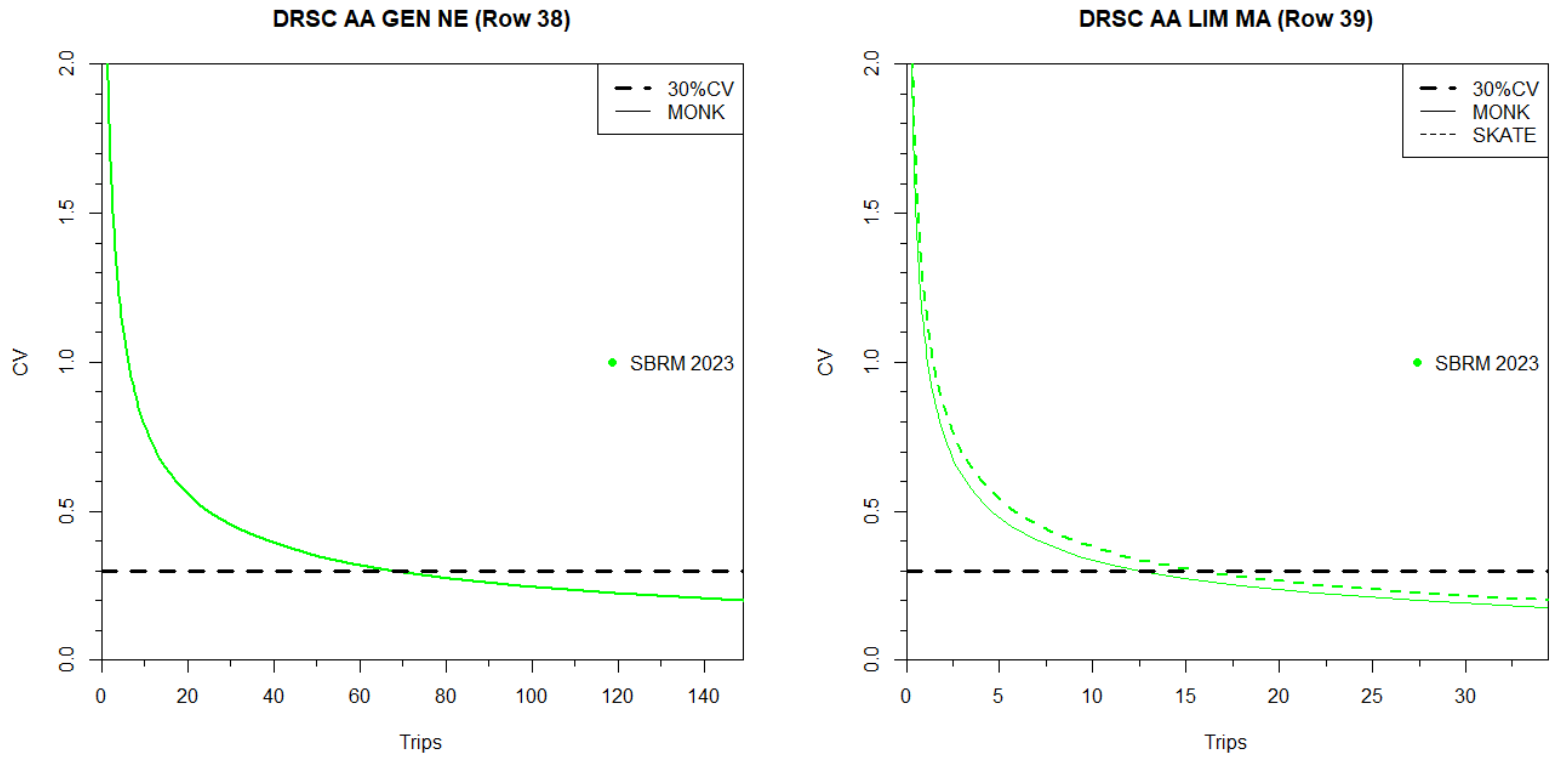


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

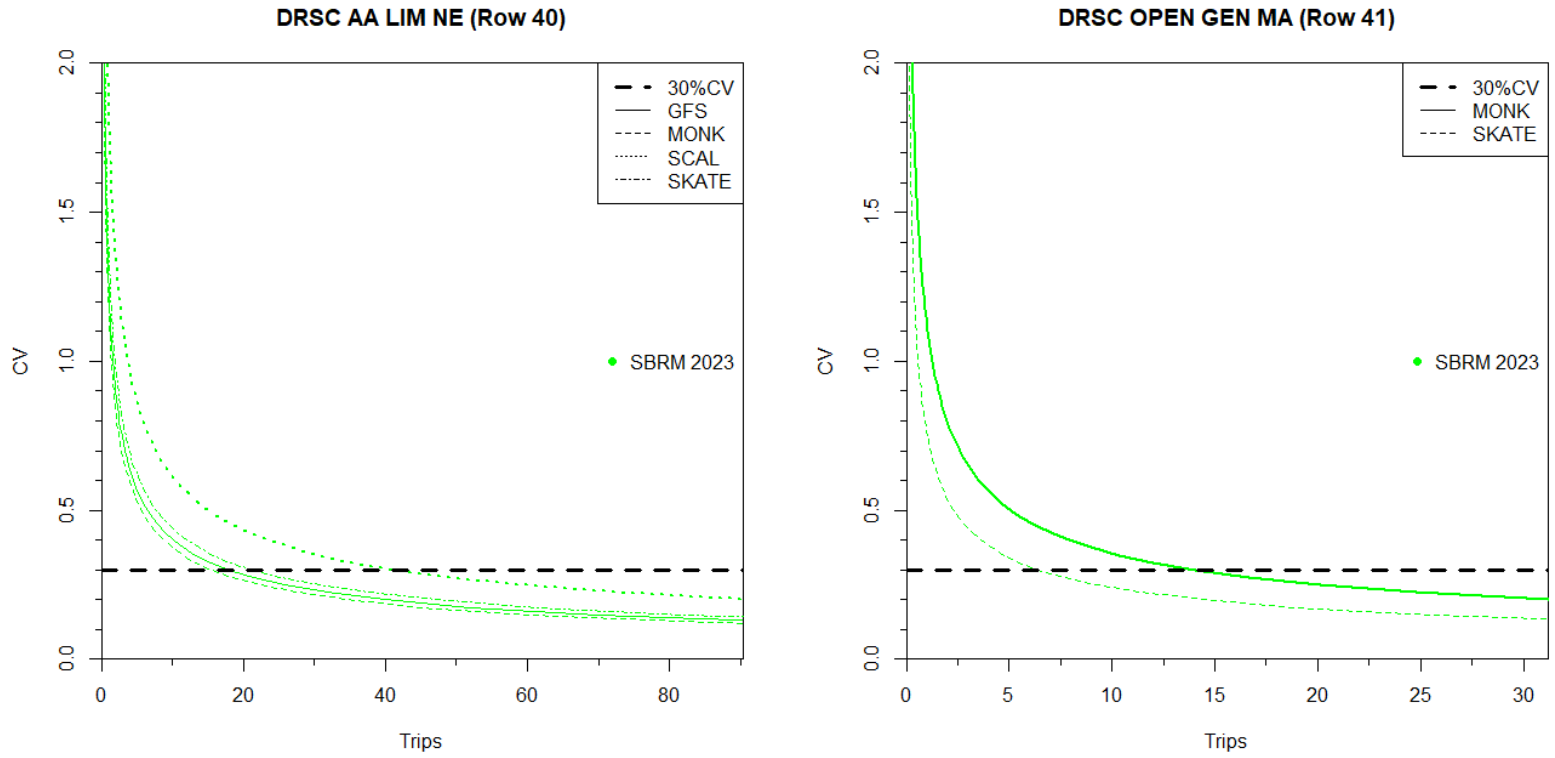


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

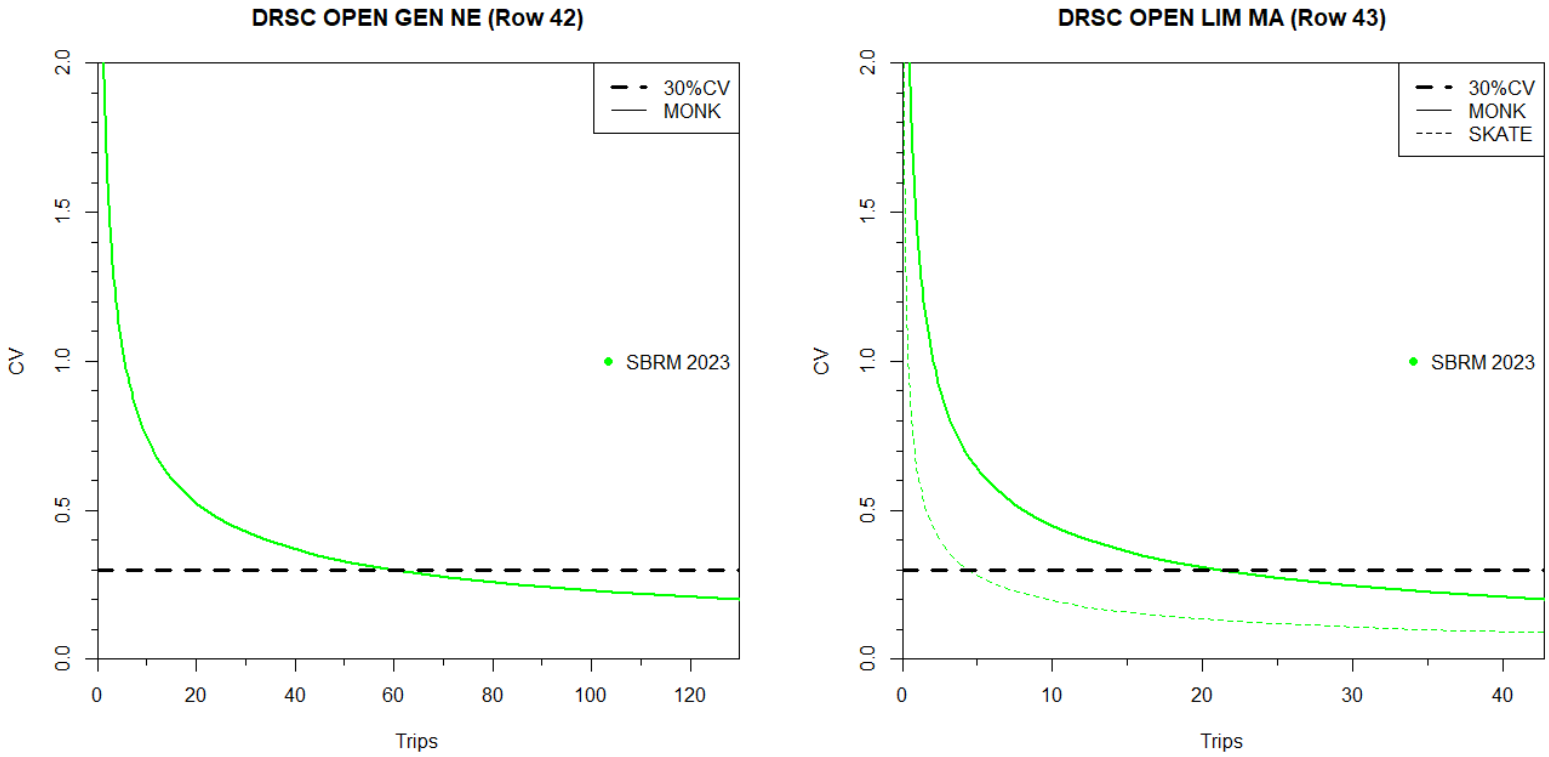


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

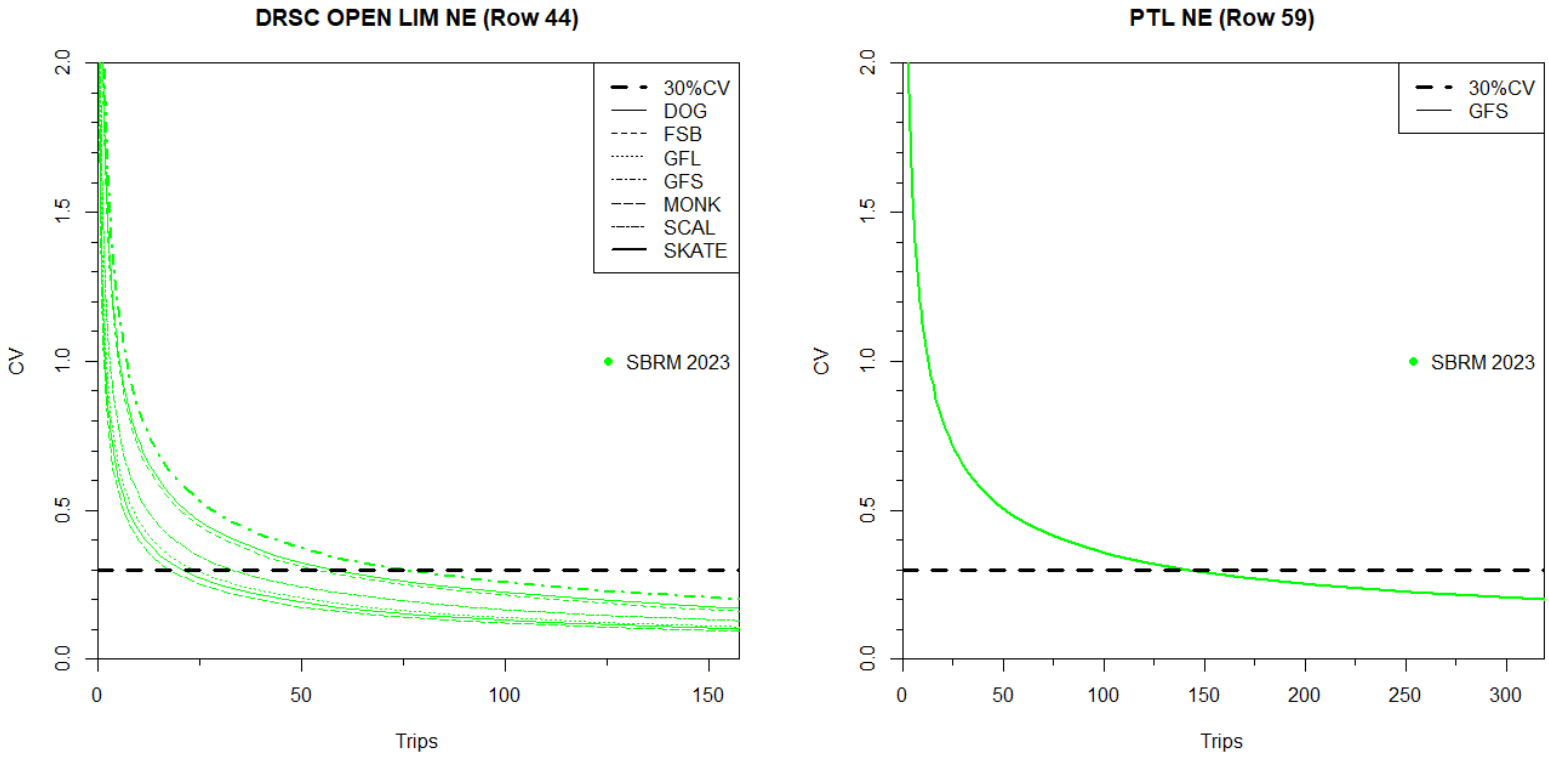


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

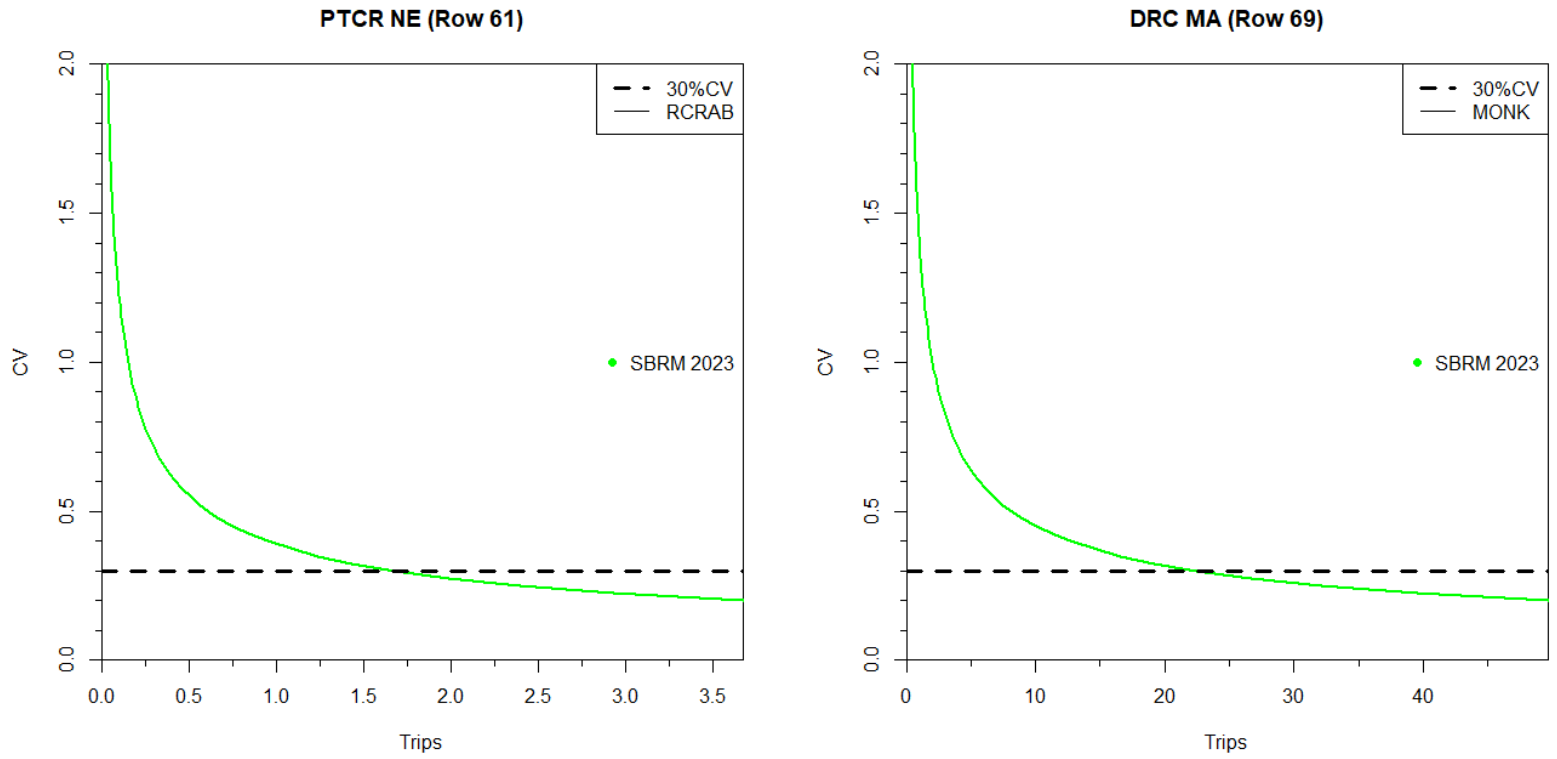


Figure 15, continued. Number of trips needed by fish/invertebrate species groups, fleet, and Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2023. Information compiled from the annual analyses (Figure 3 in McAfee and Wigley 2023). See Table 5 for species group abbreviations. CV = coefficient of variation; horizontal dashed line indicates the 30% CV. SBRM years 2021 and 2022 not shown because no discard analysis conducted in those years.

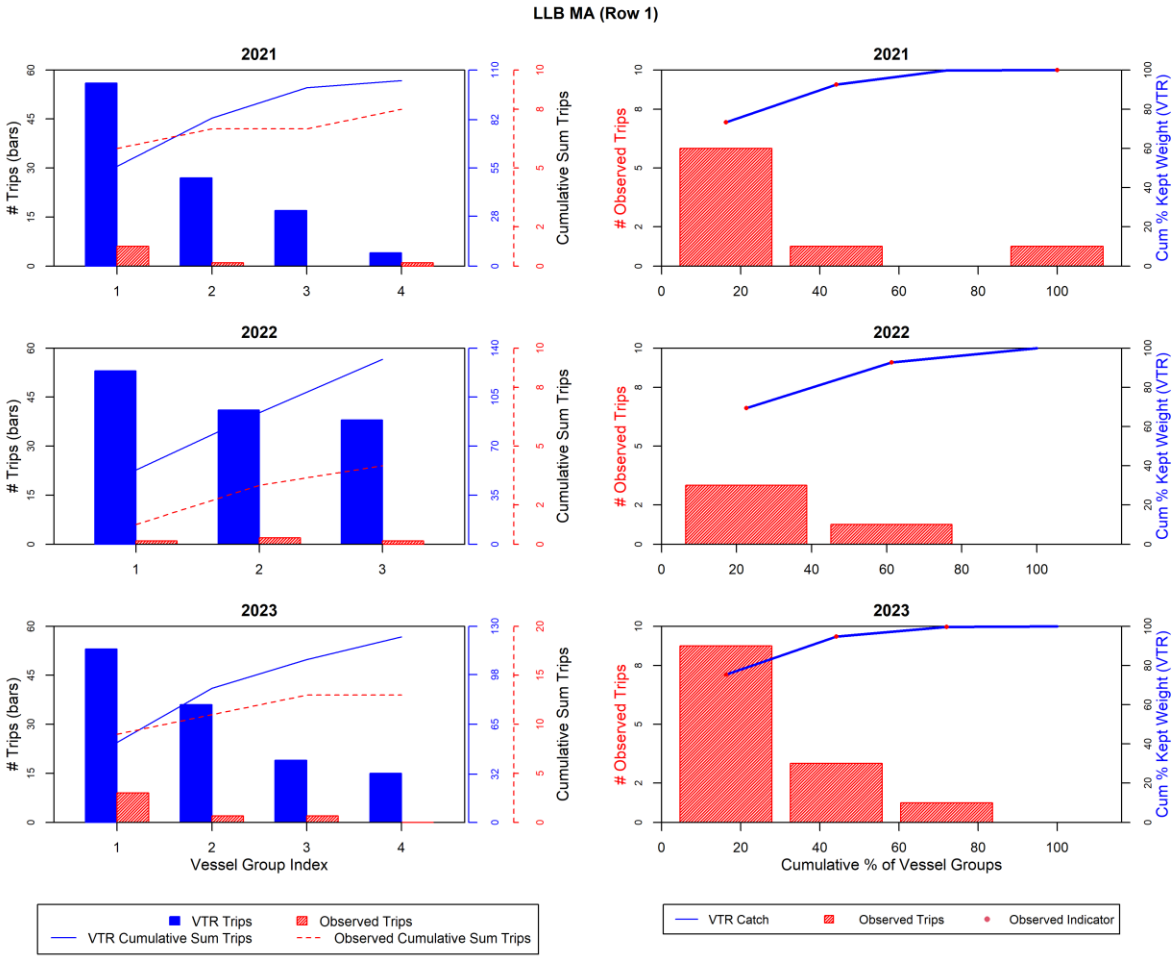
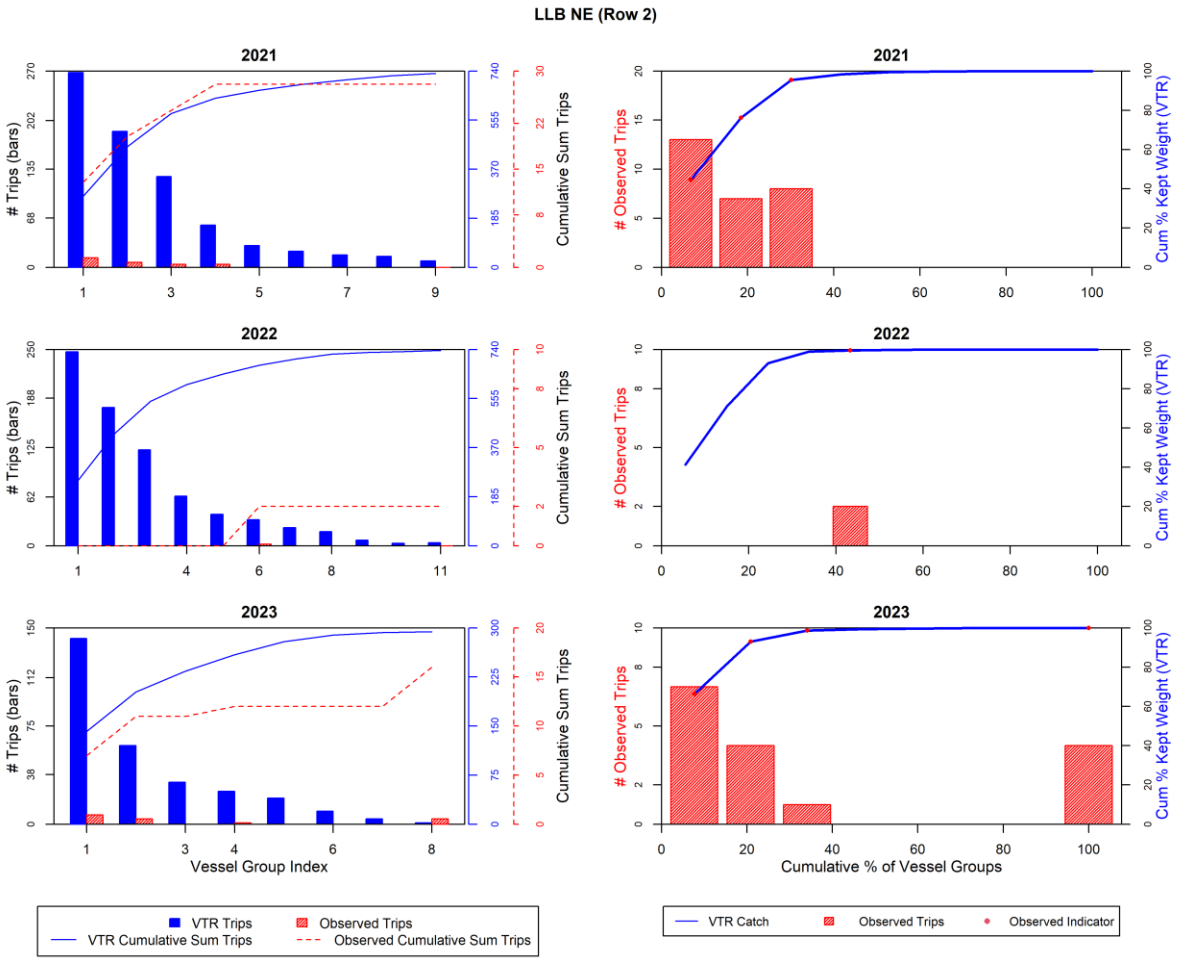


Figure 16. Number of trips (bars; left-hand plots) by vessel group and their cumulative sum by data set (Vessel Trip Report [VTR] as blue solid line and observer [Observed] as red dashed line) and the cumulative percentage of kept weight of all species on VTR trips by vessel group (right-hand plots) for 1 of 31 selected fleets, by Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). See Appendix Table 1 for fleet name abbreviations.



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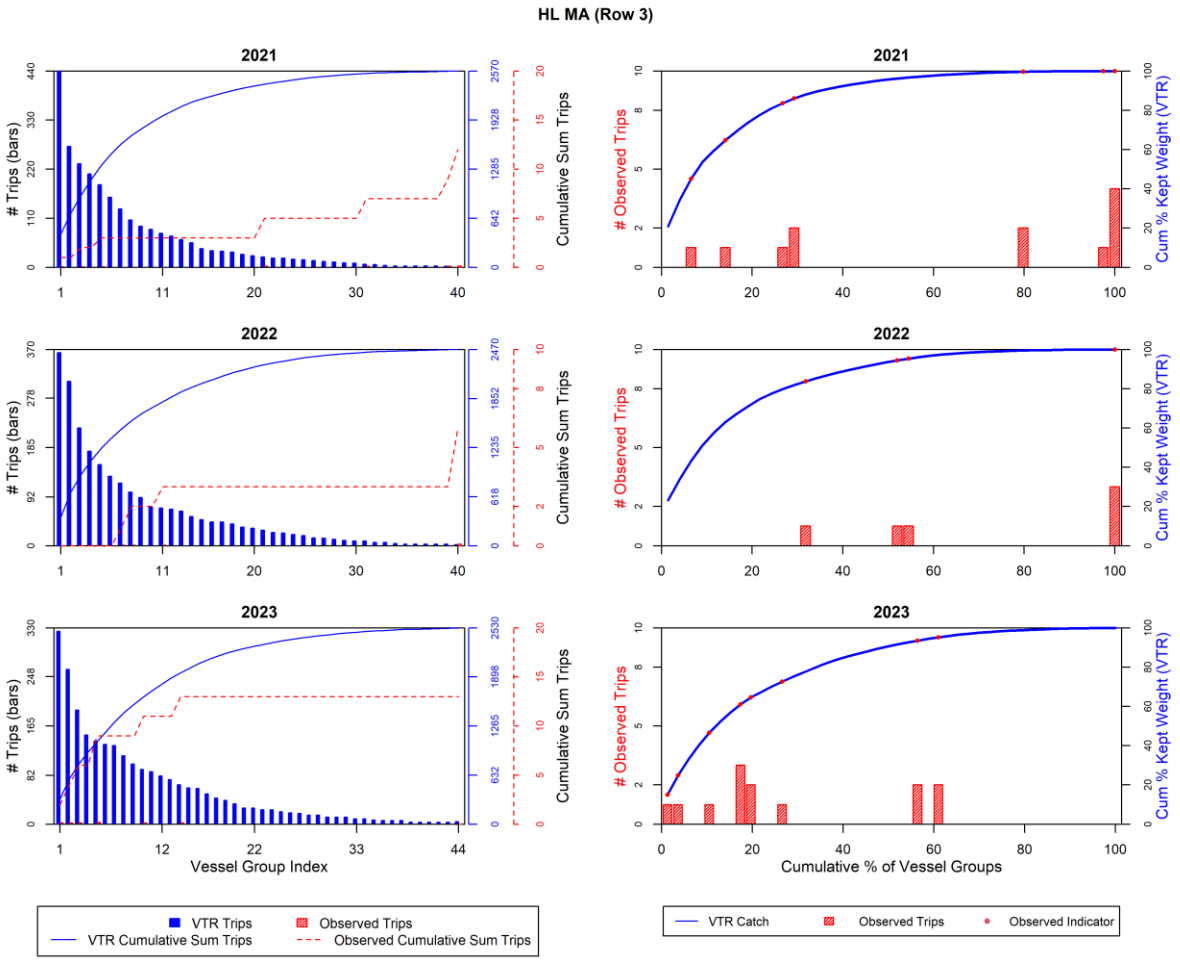

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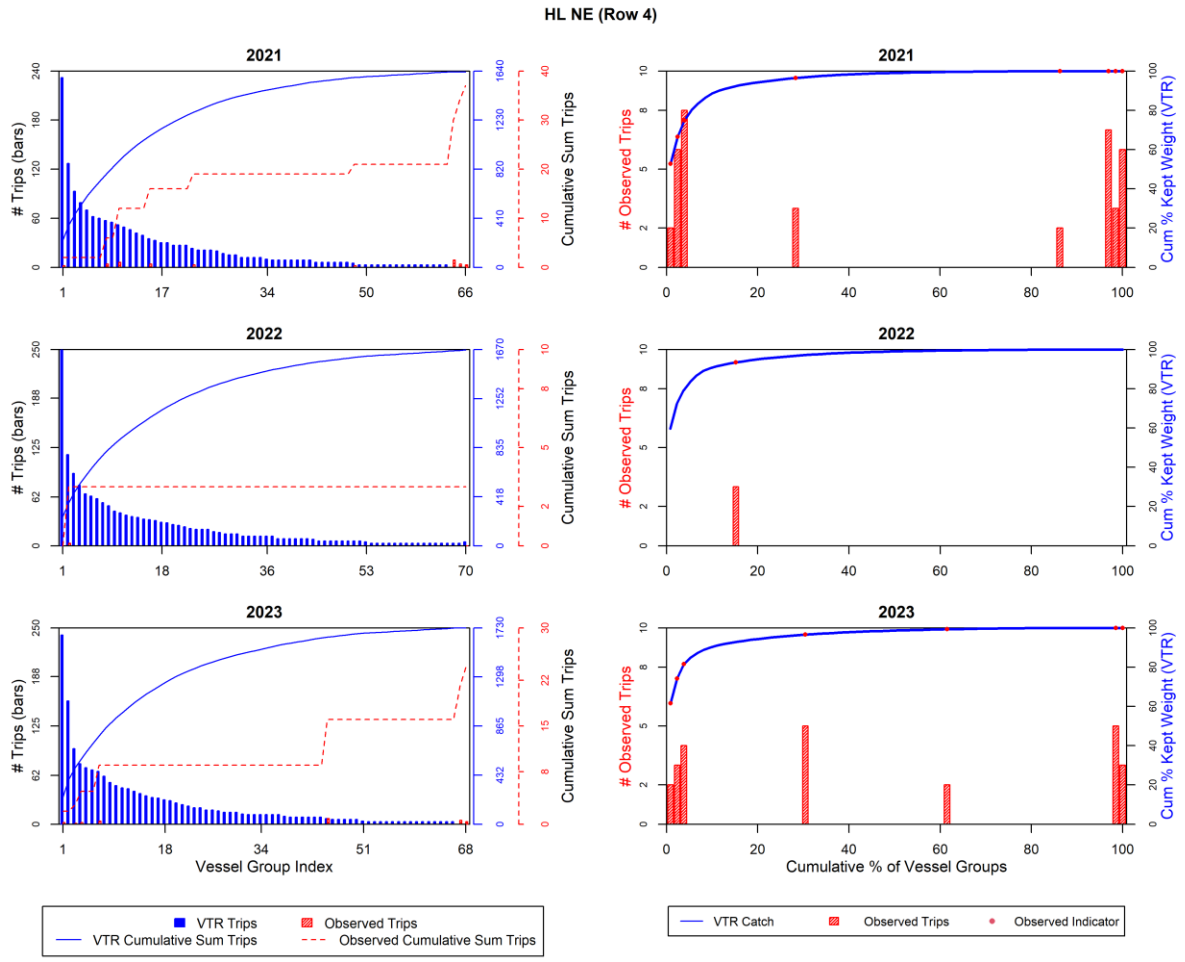

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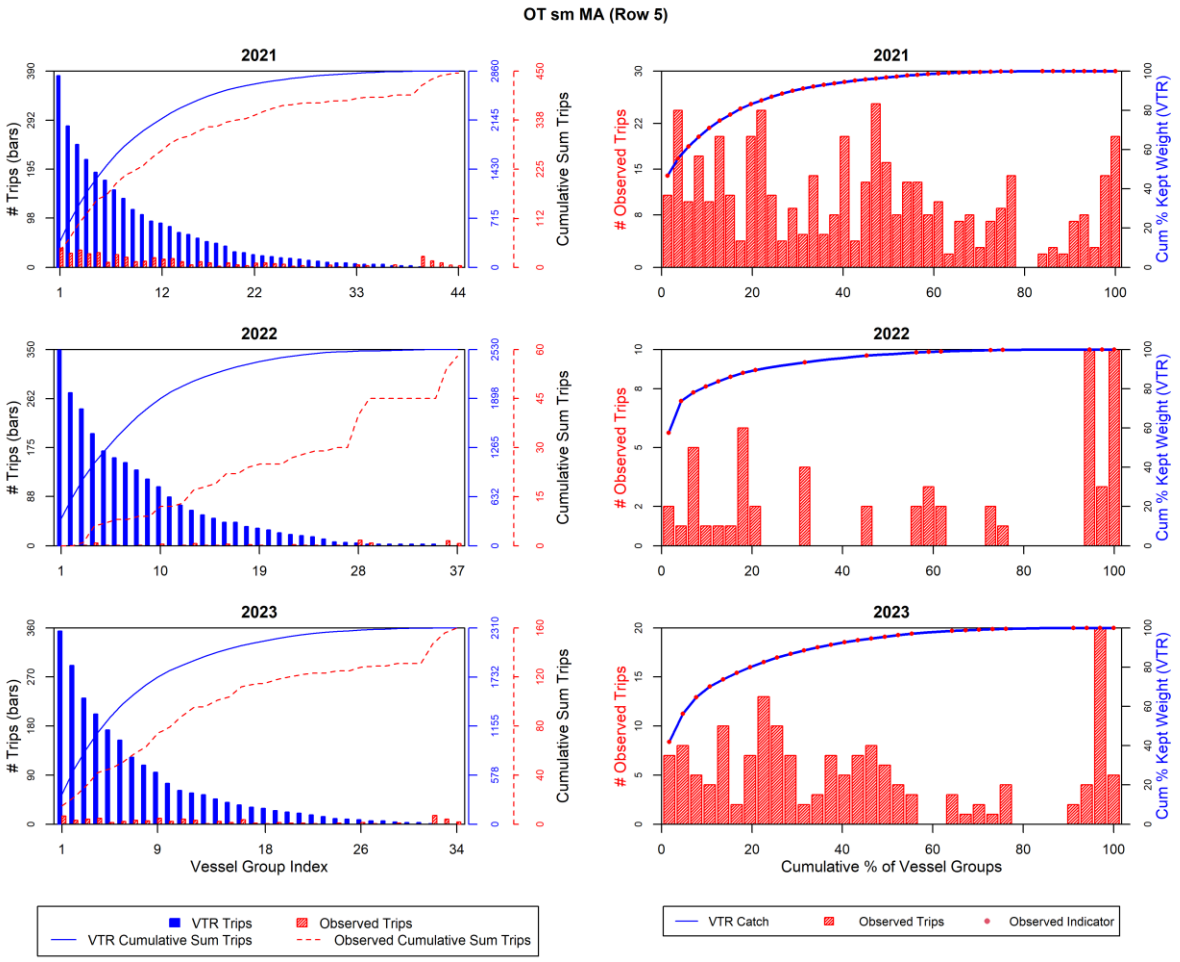

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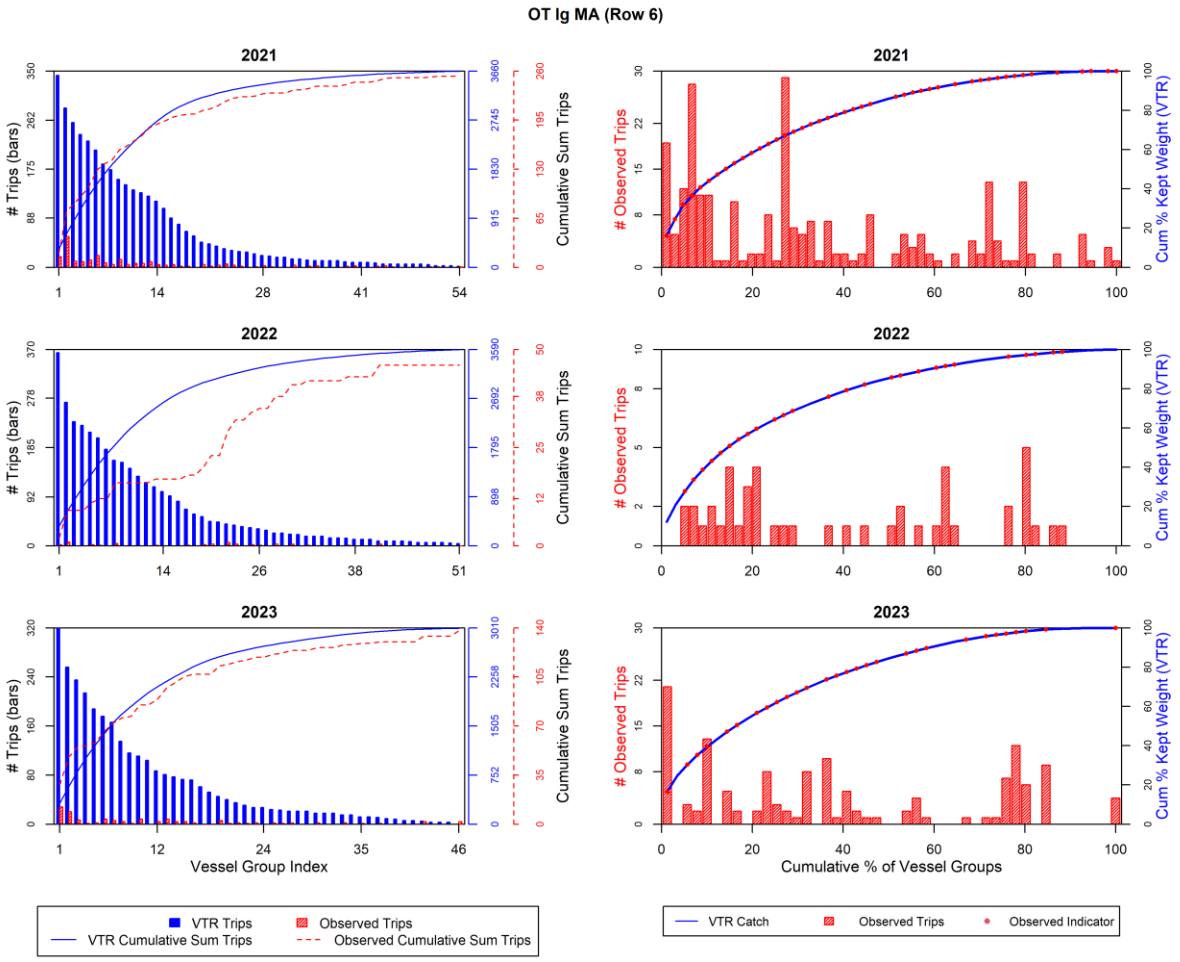

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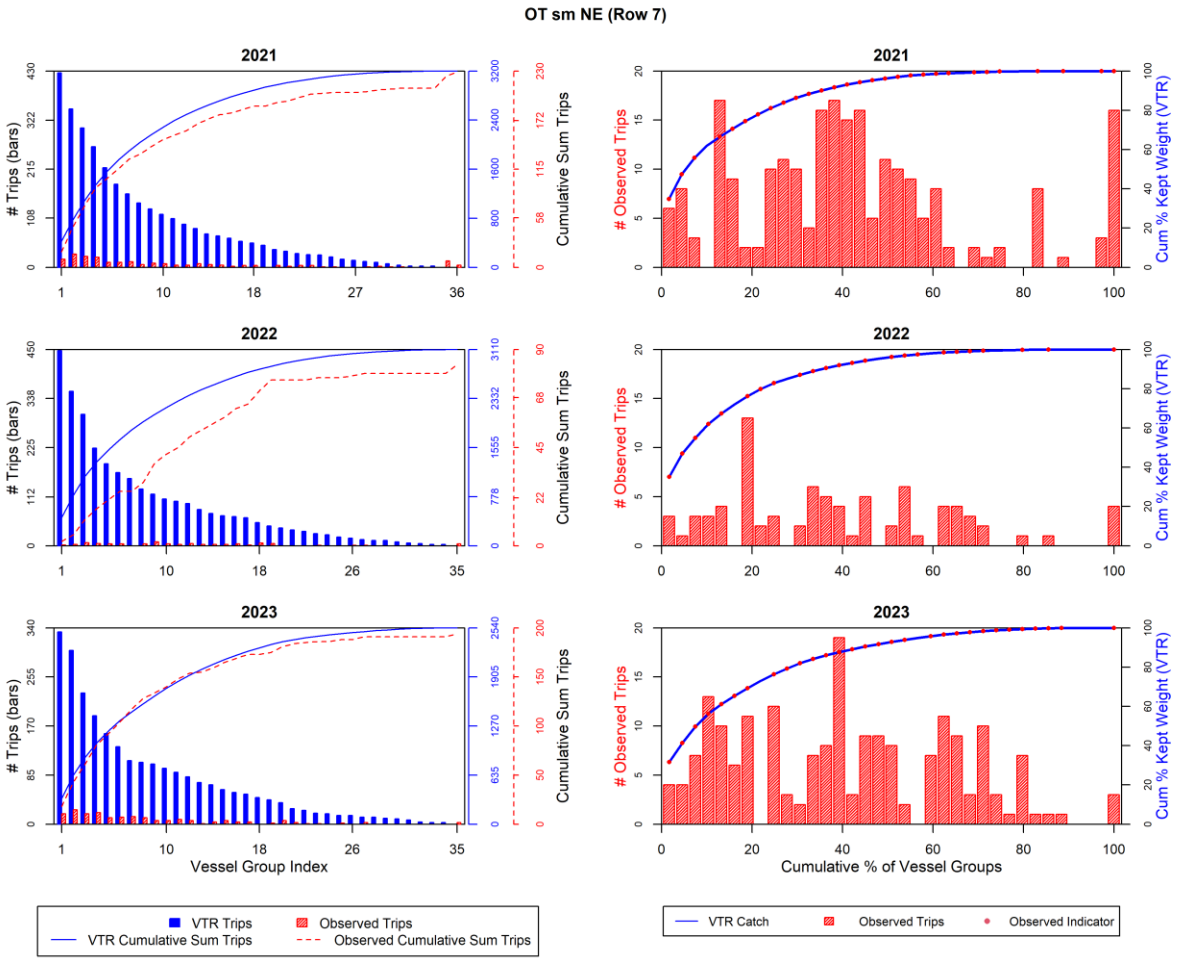

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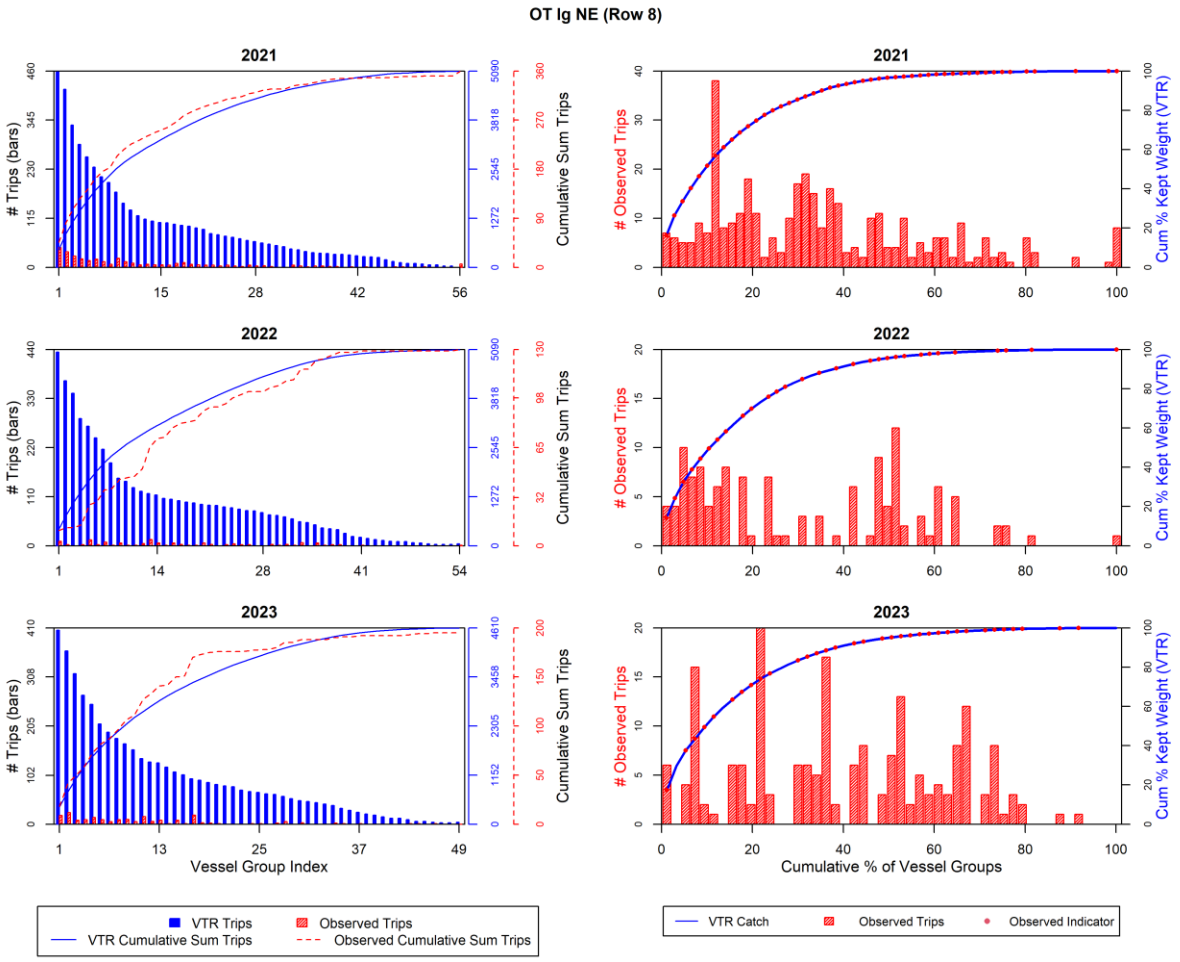

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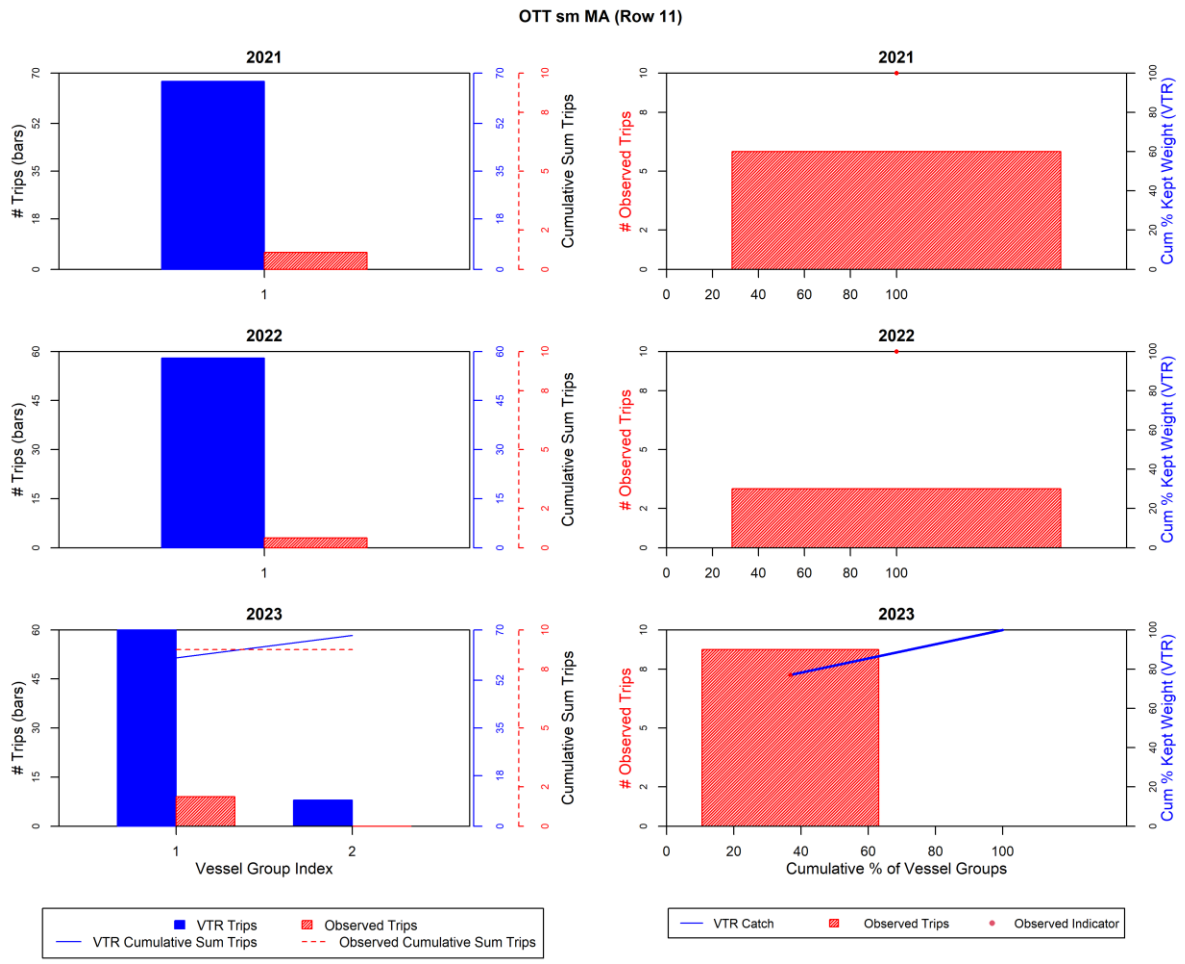

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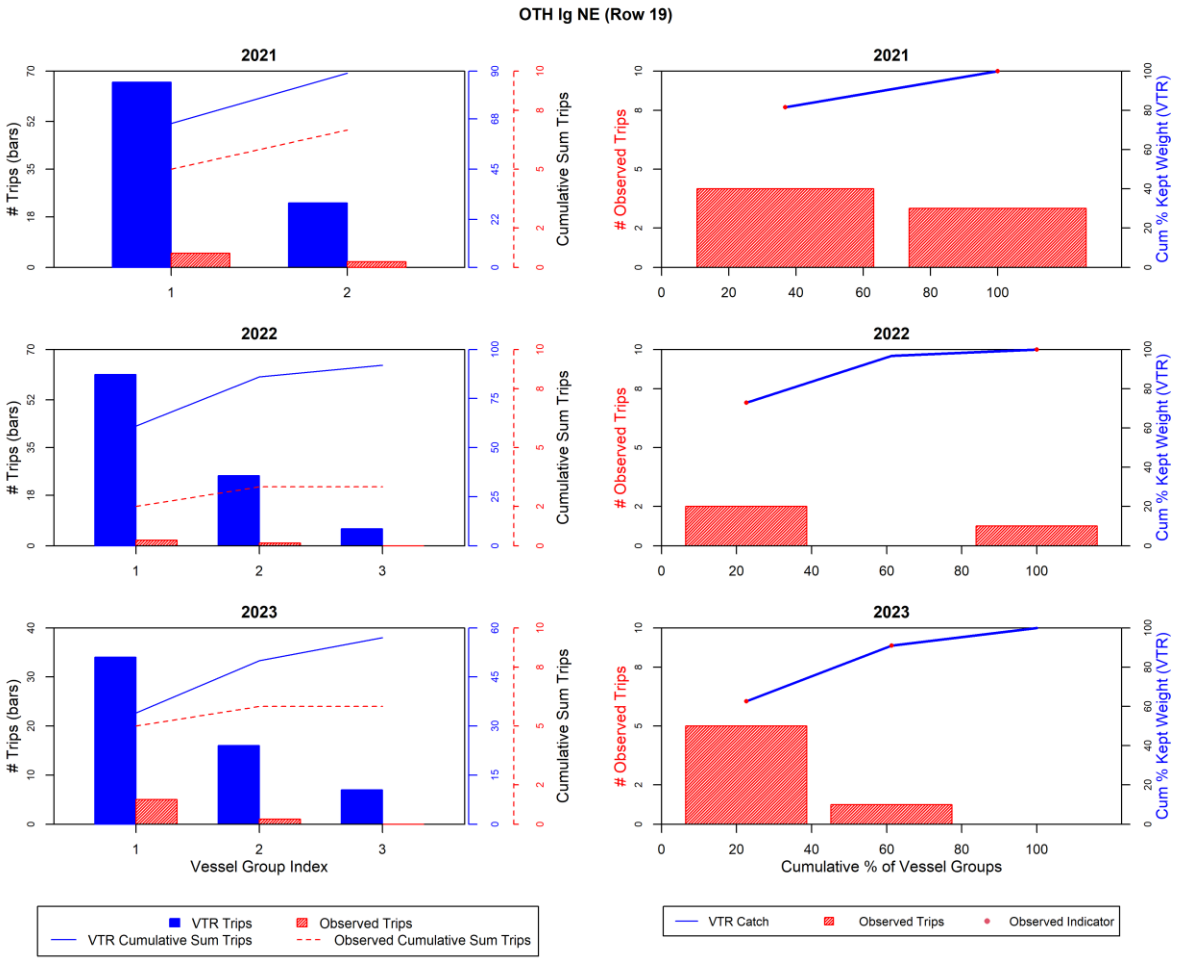

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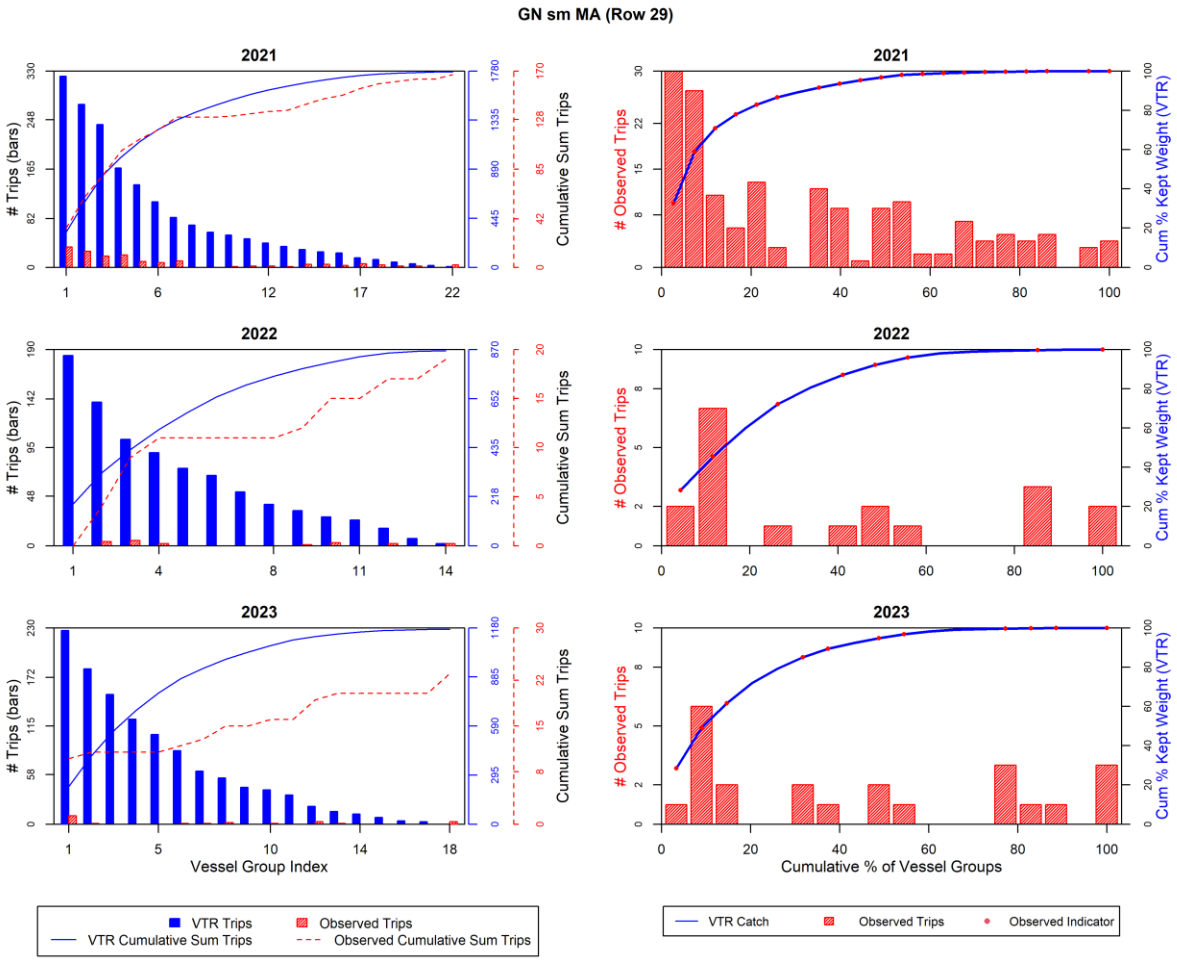

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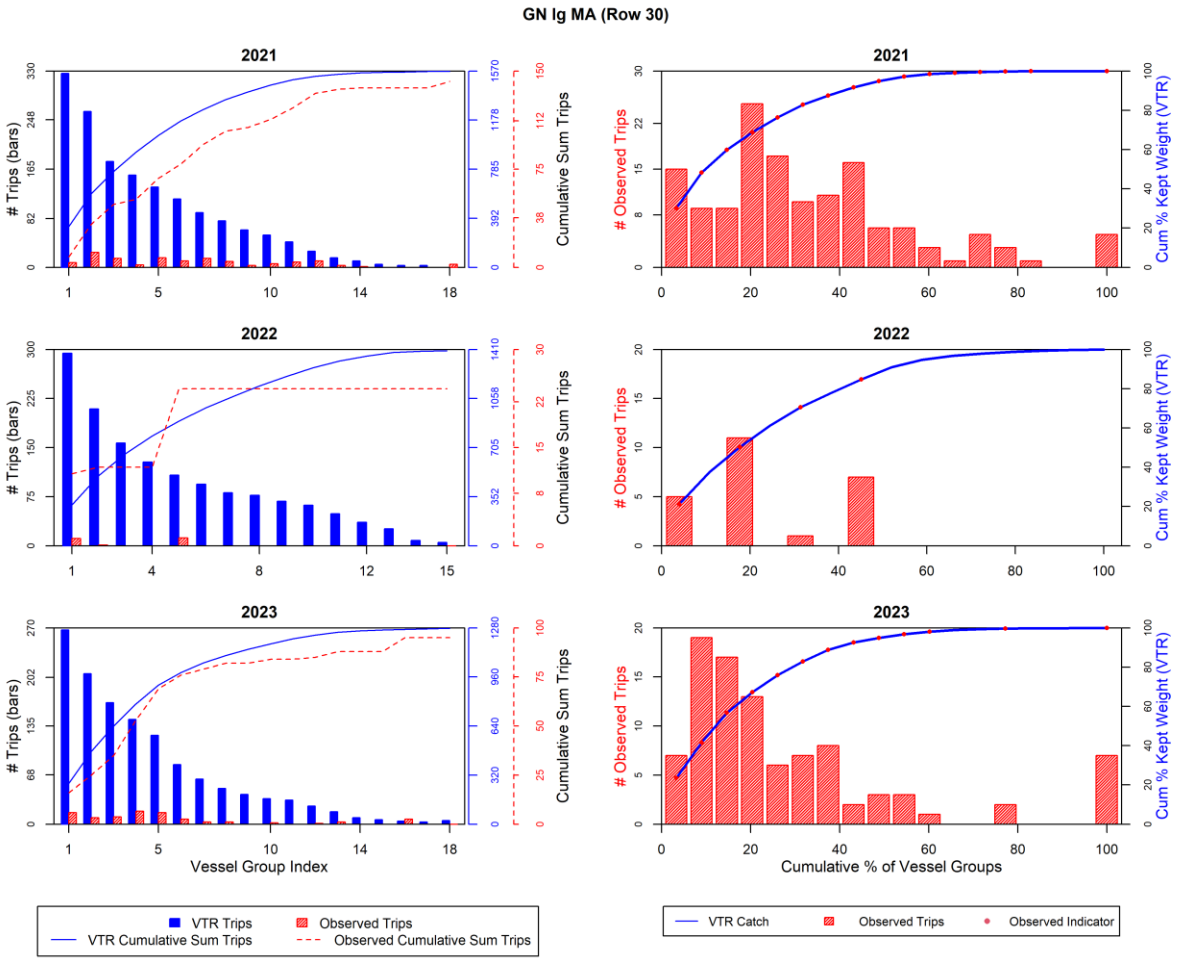

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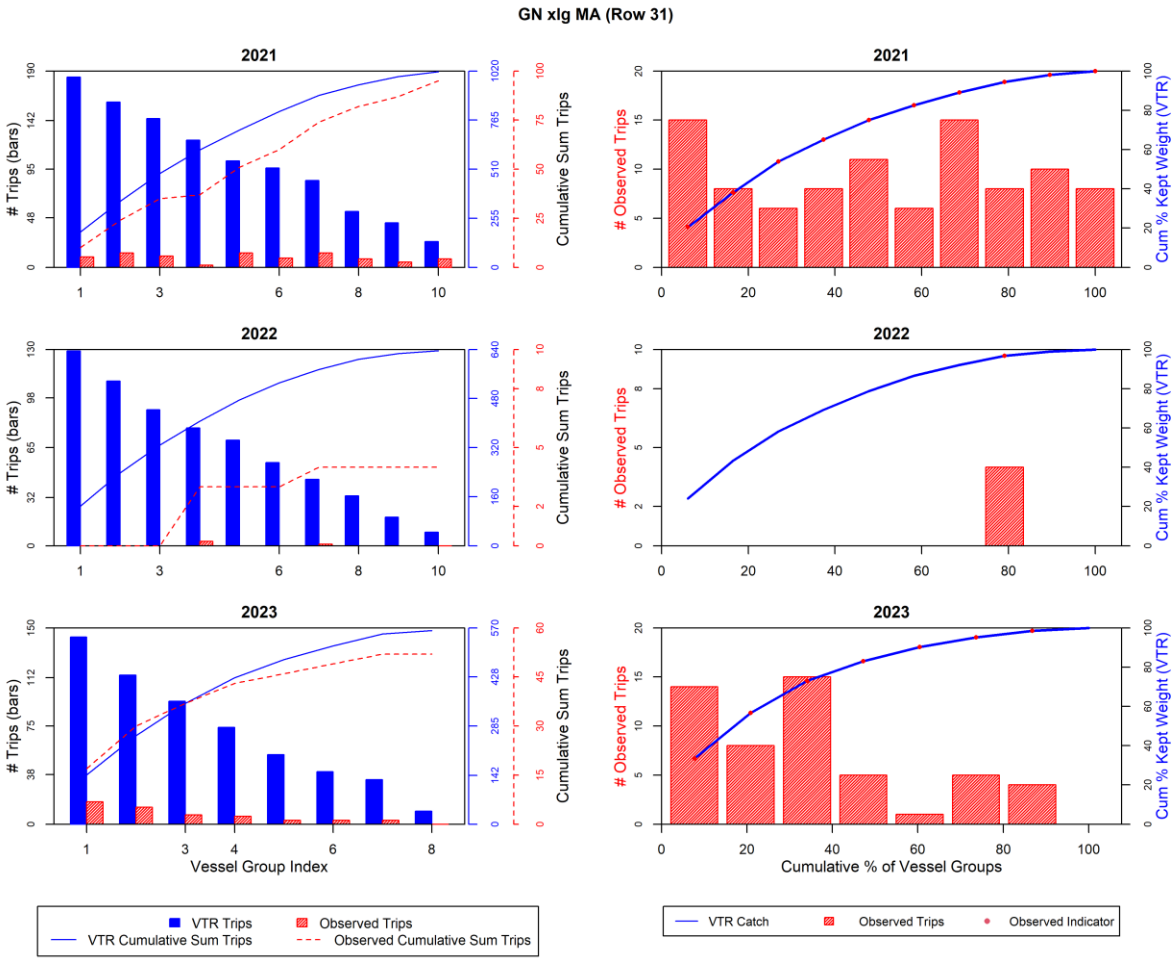

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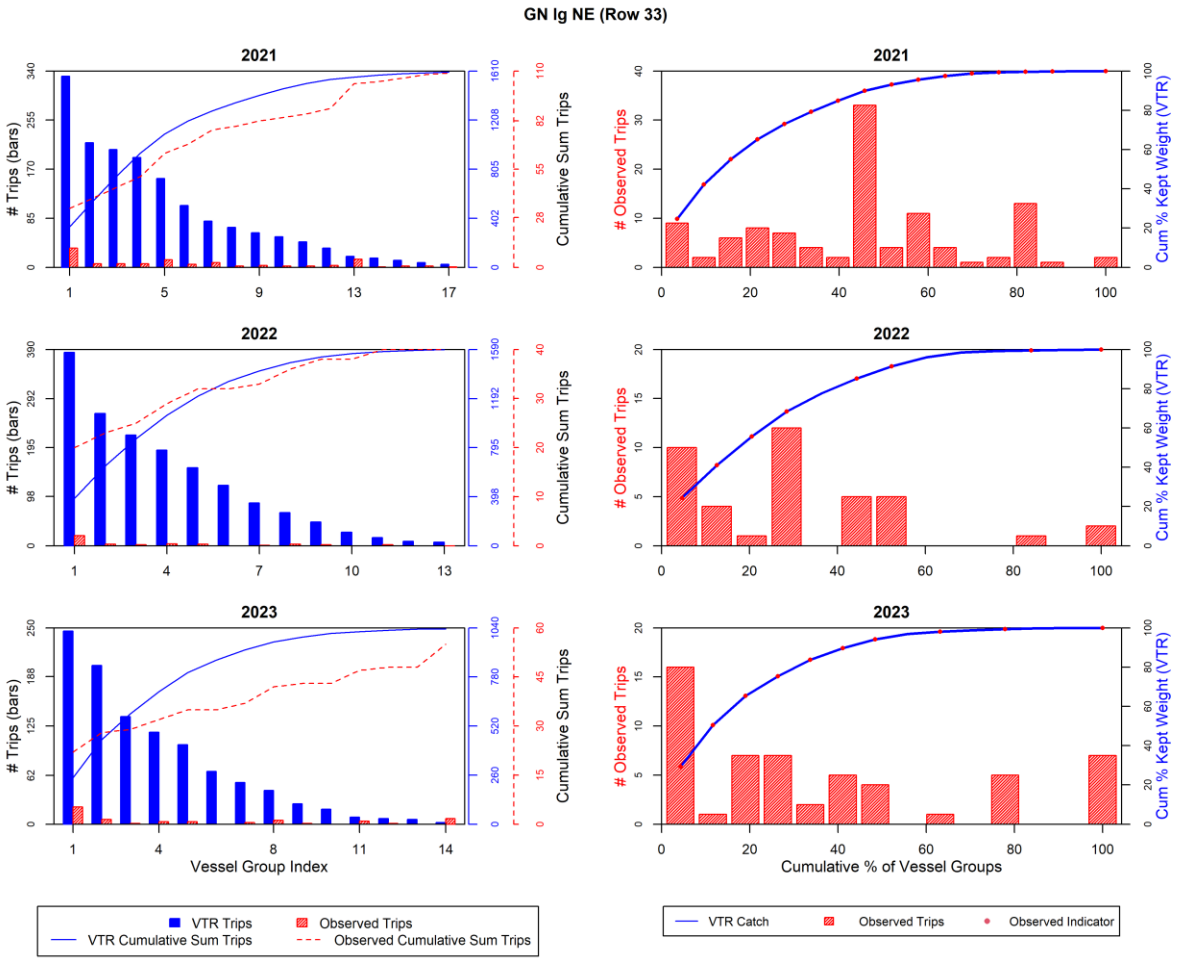

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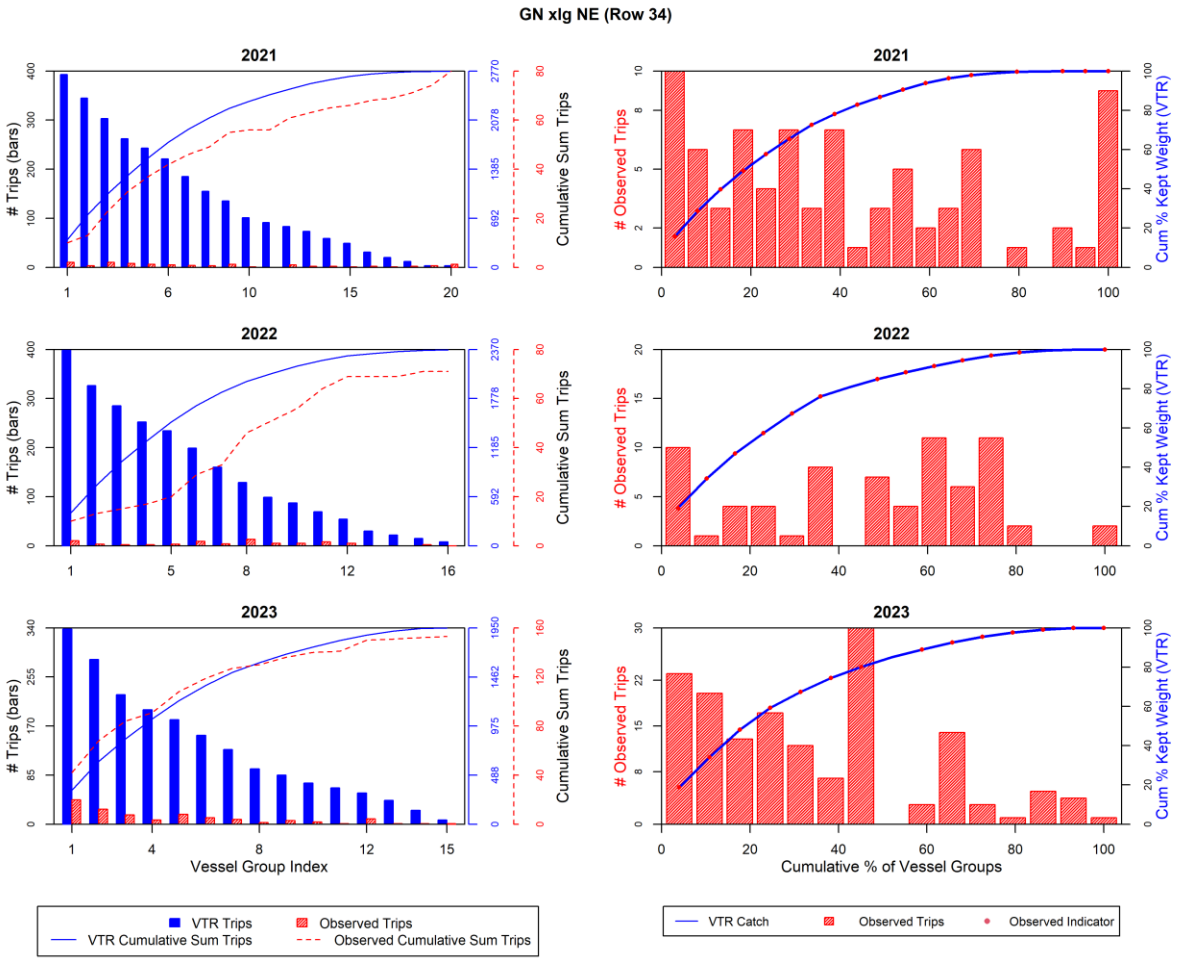

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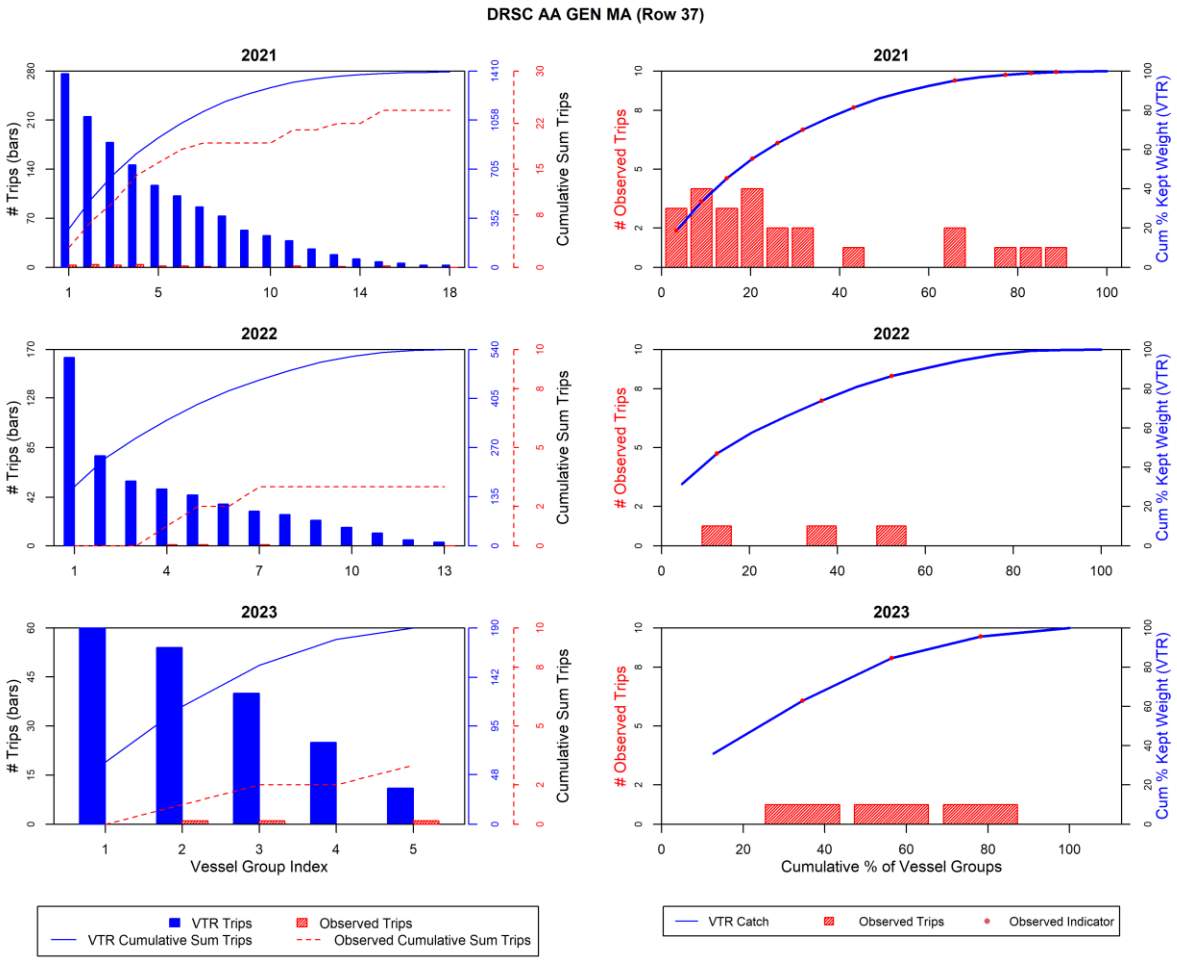

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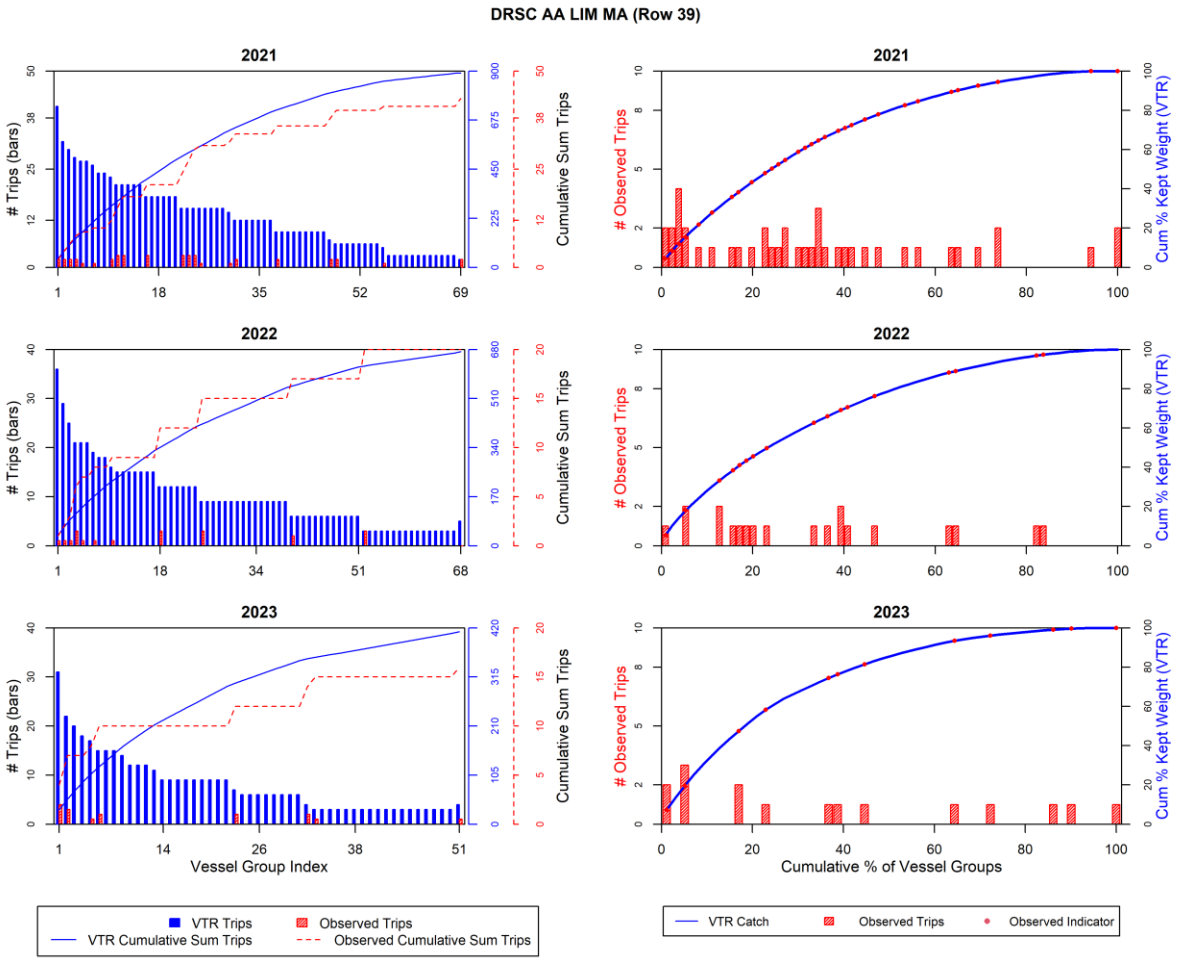

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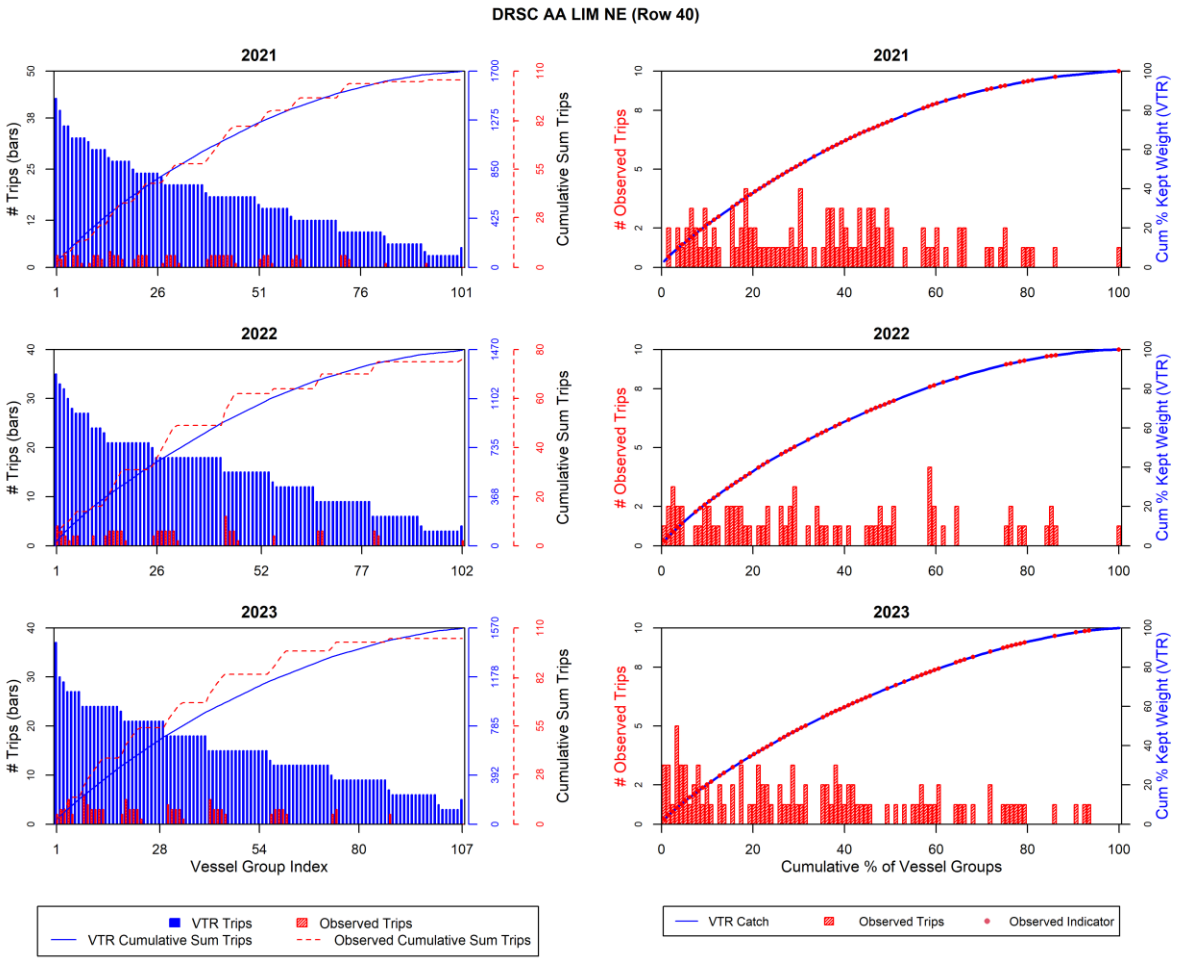

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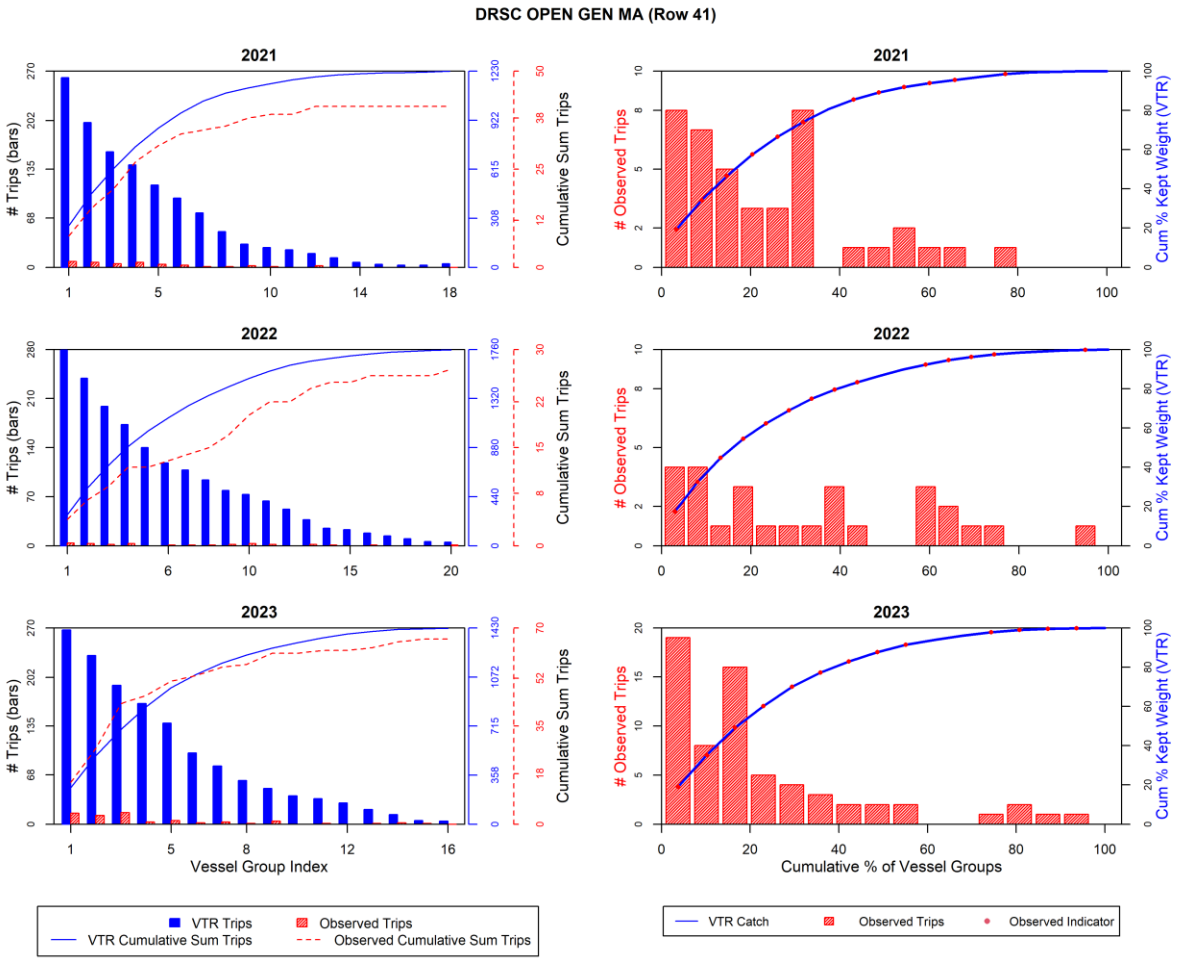

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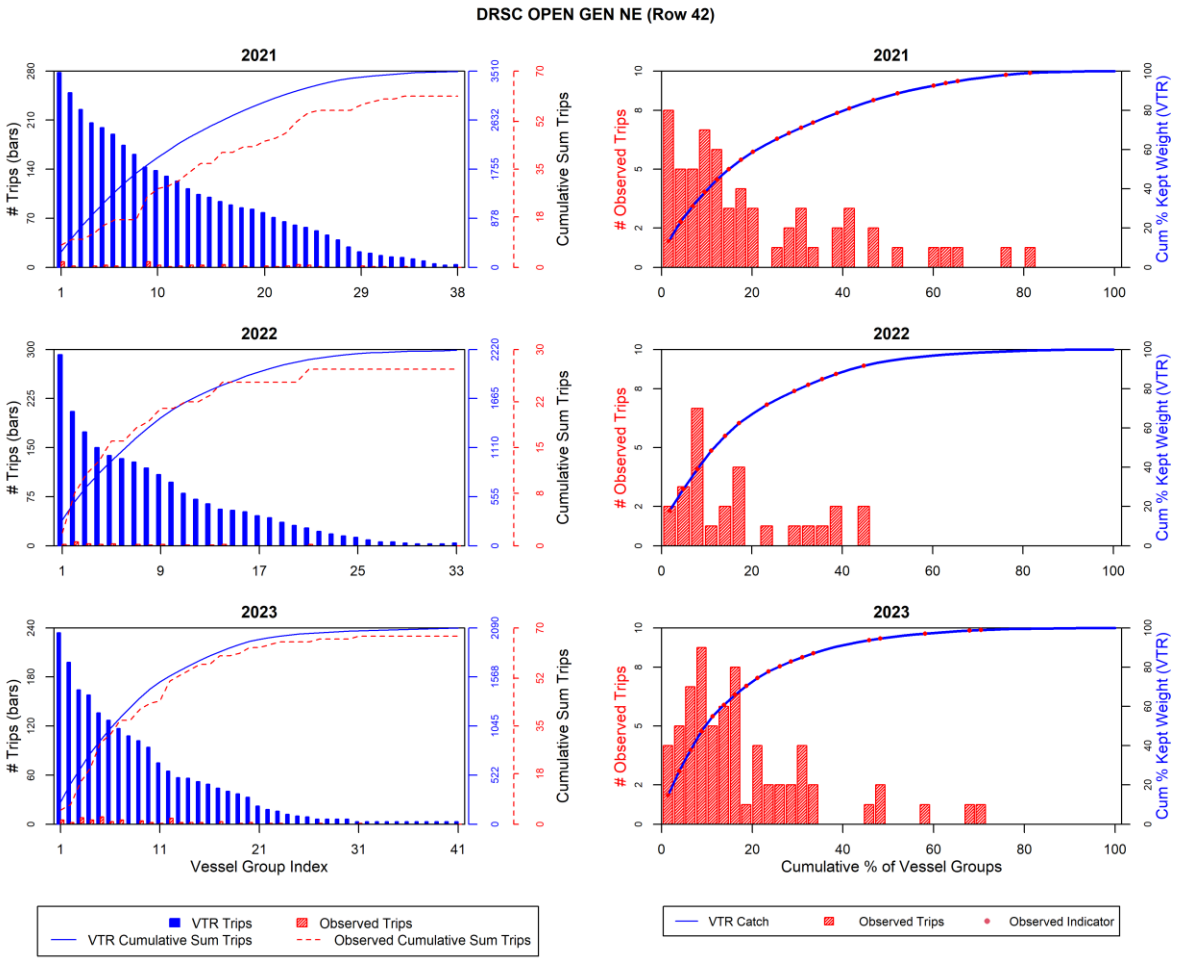

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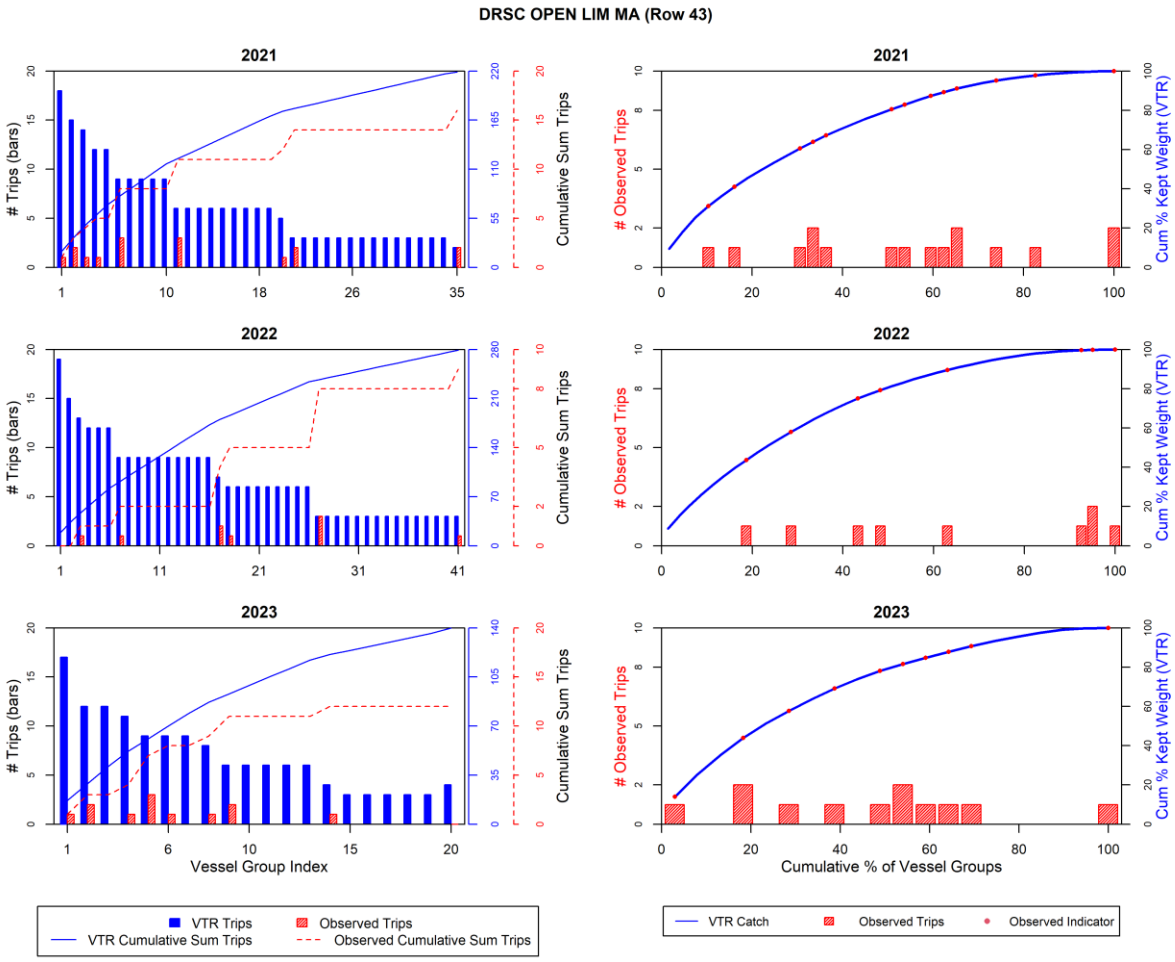

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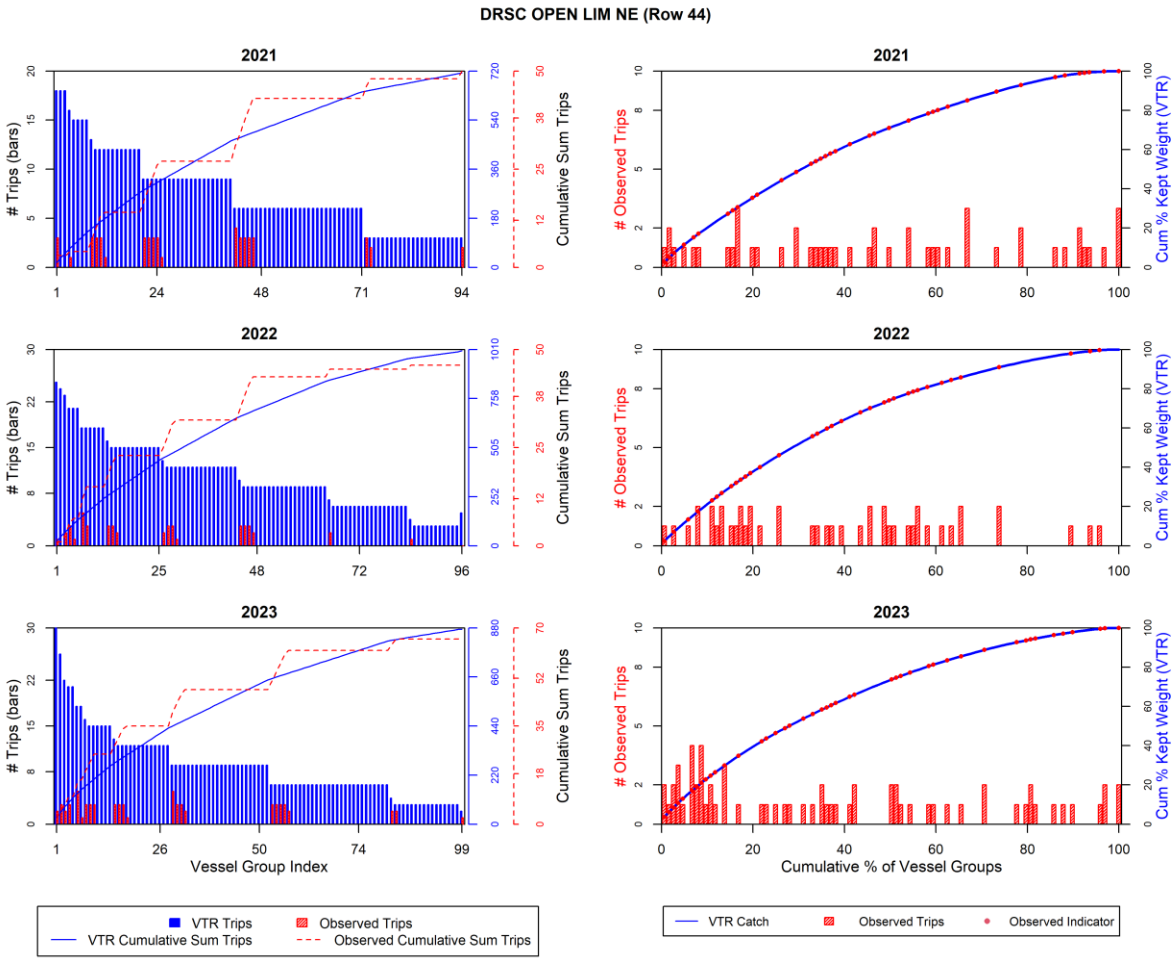

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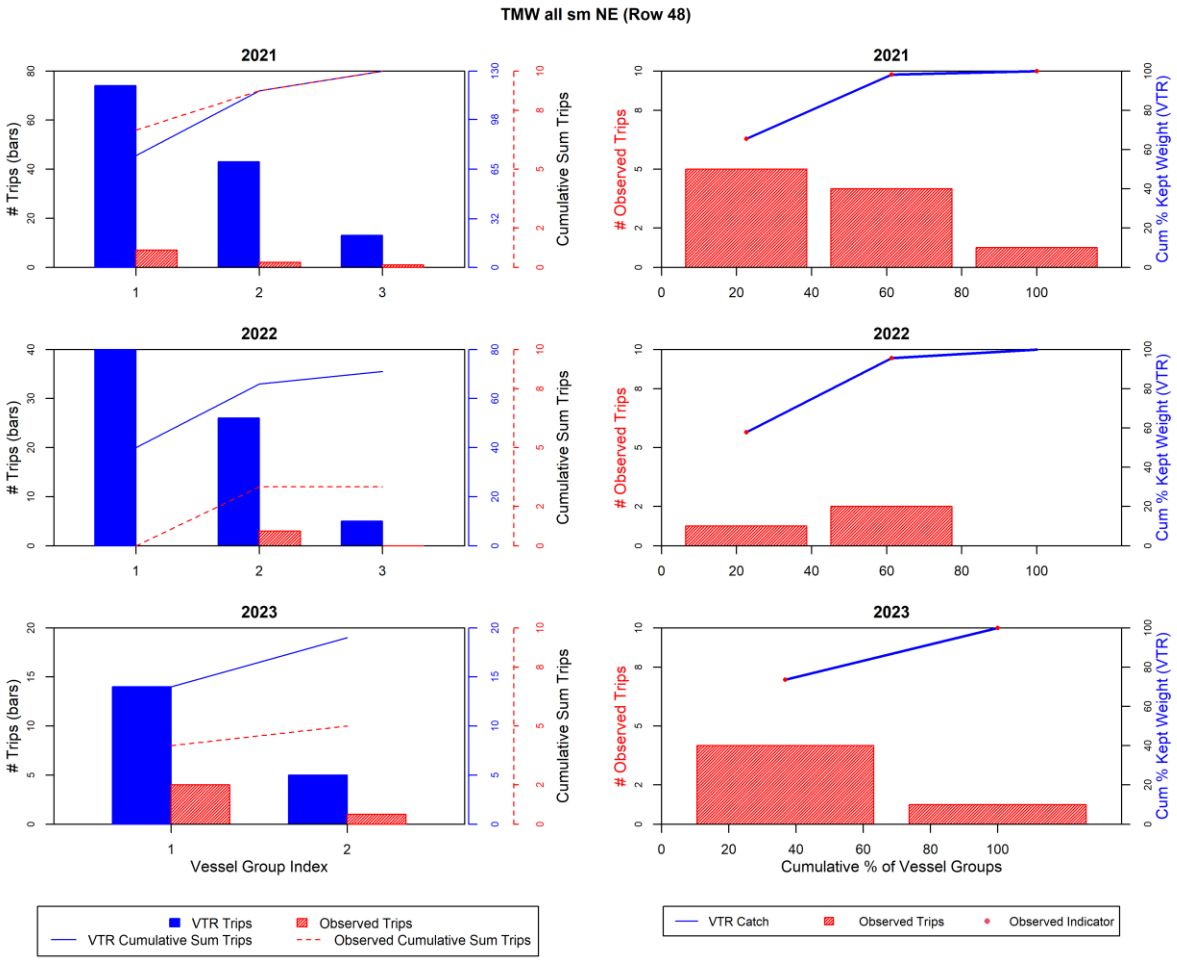

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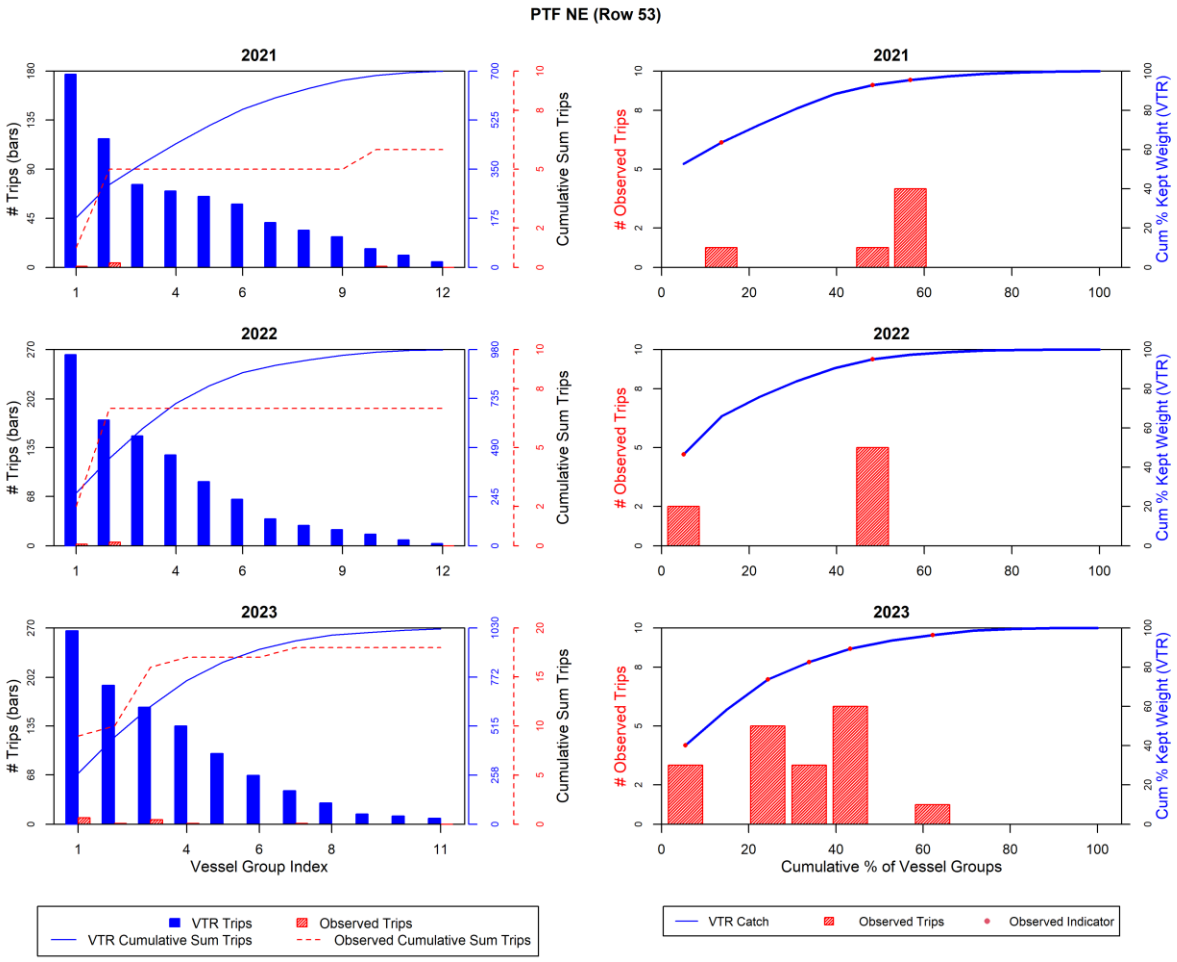

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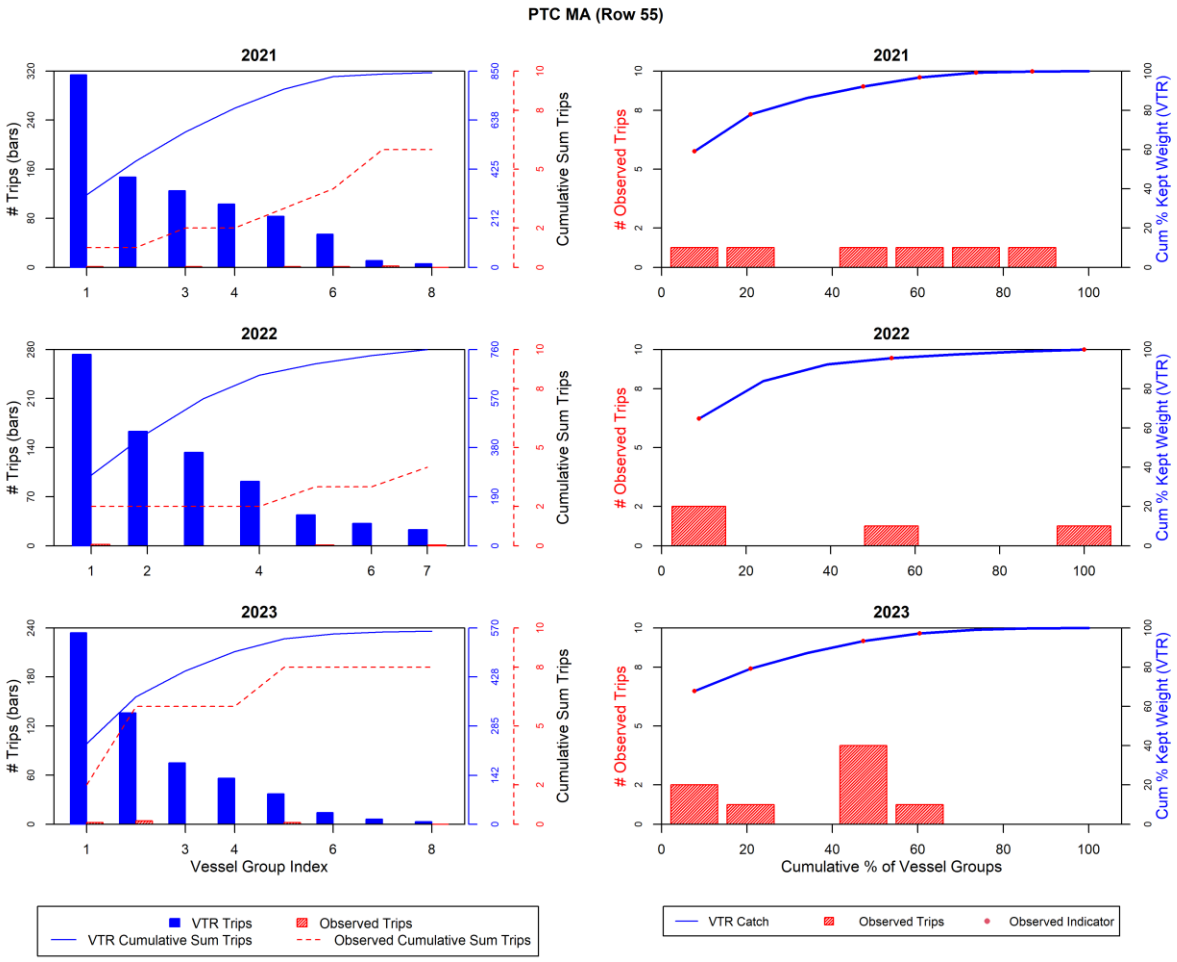

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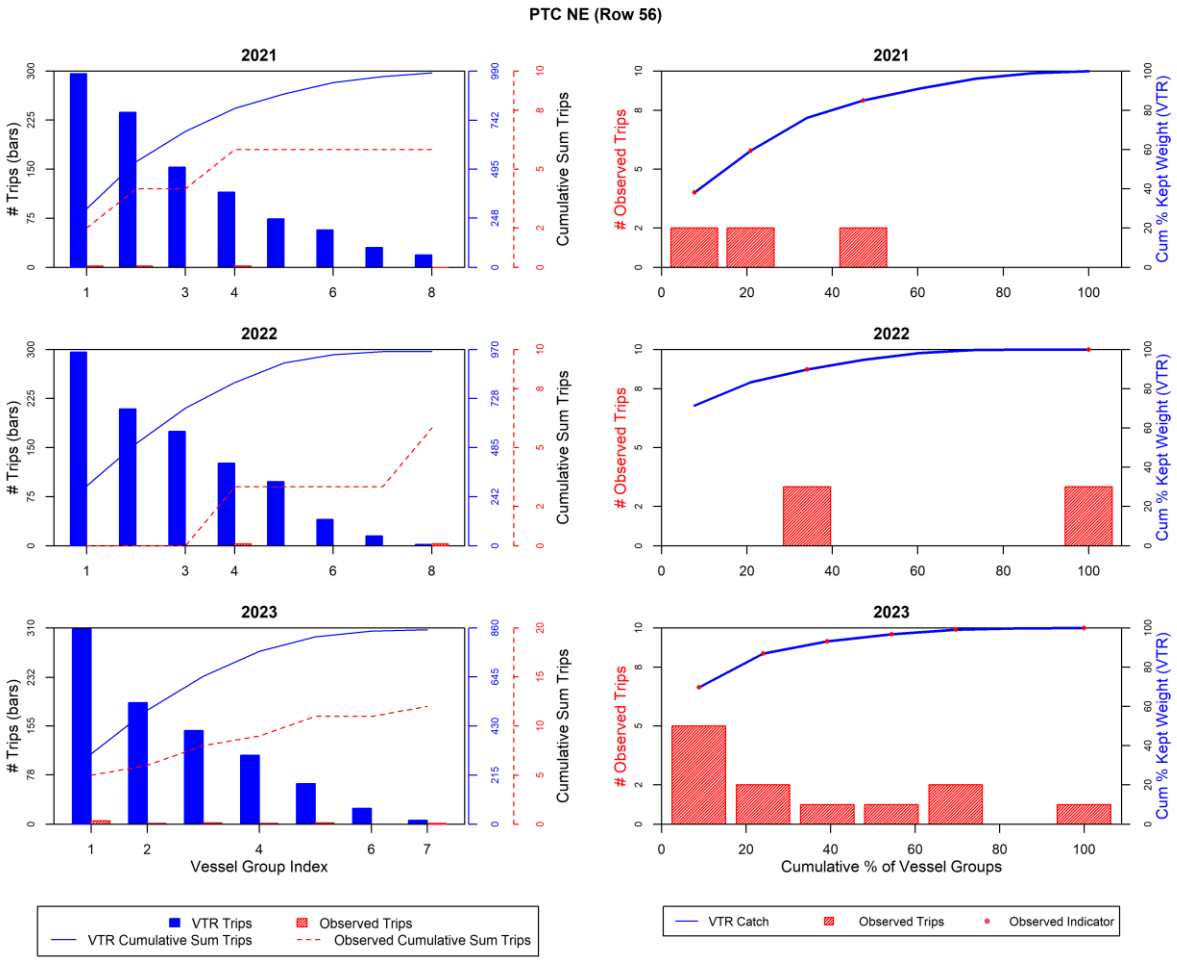

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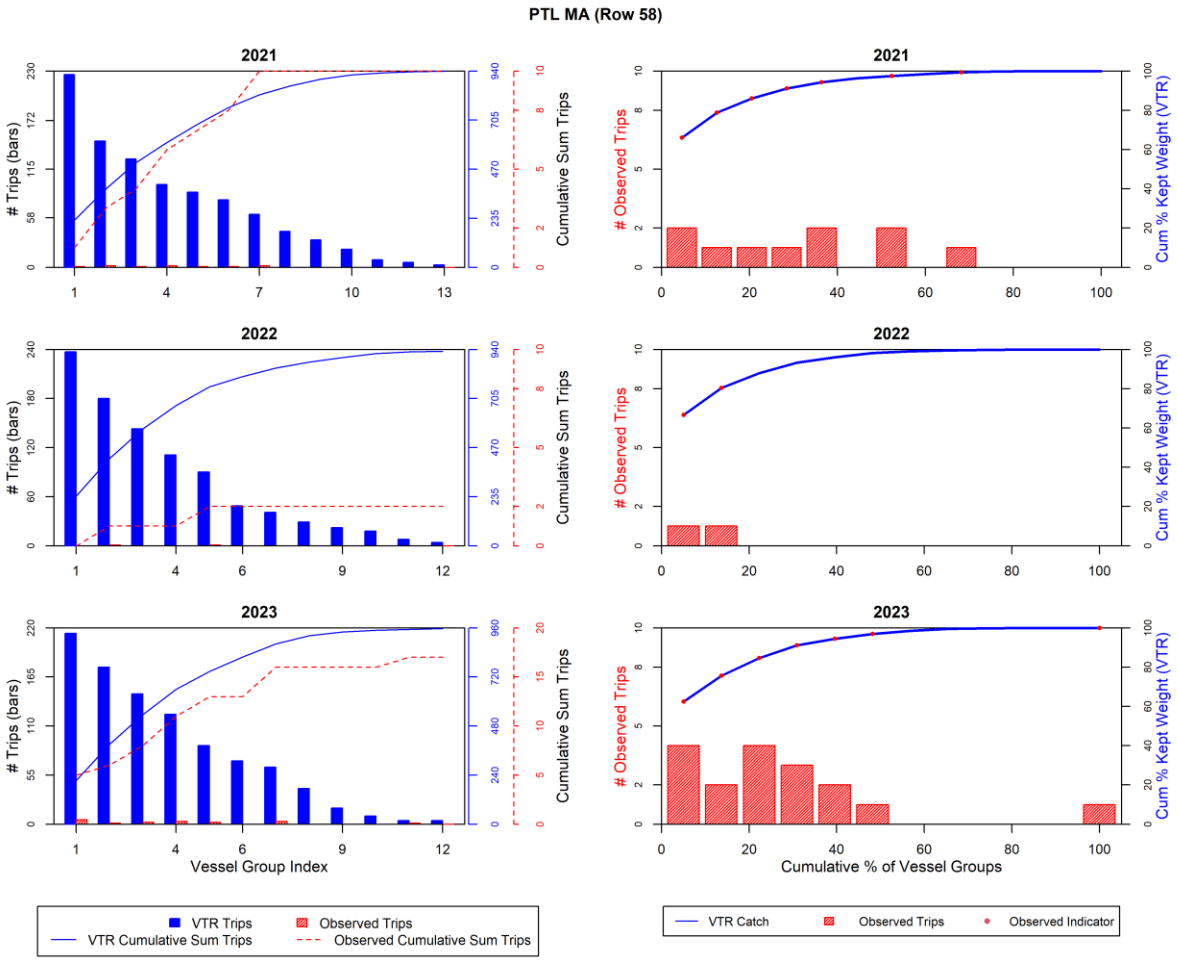

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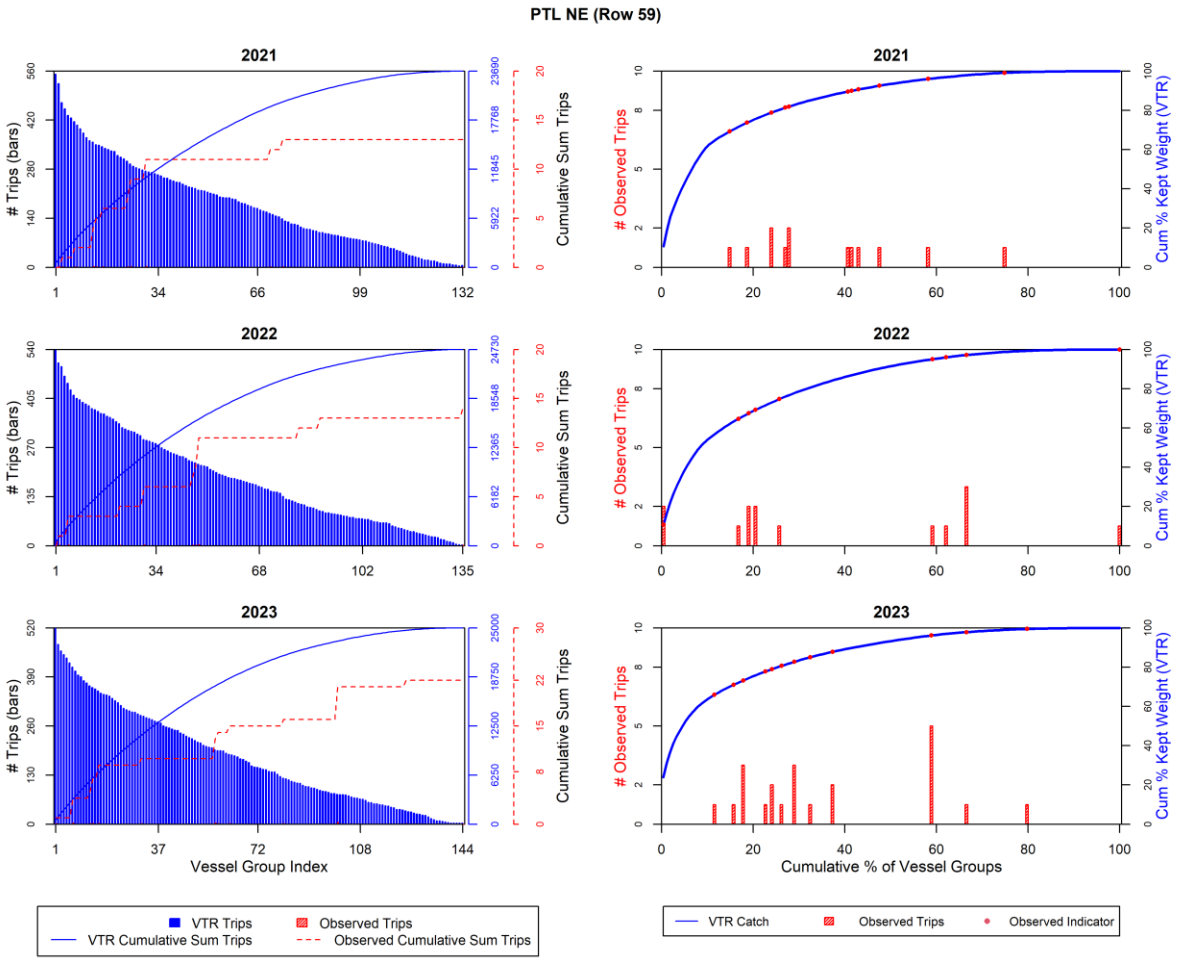

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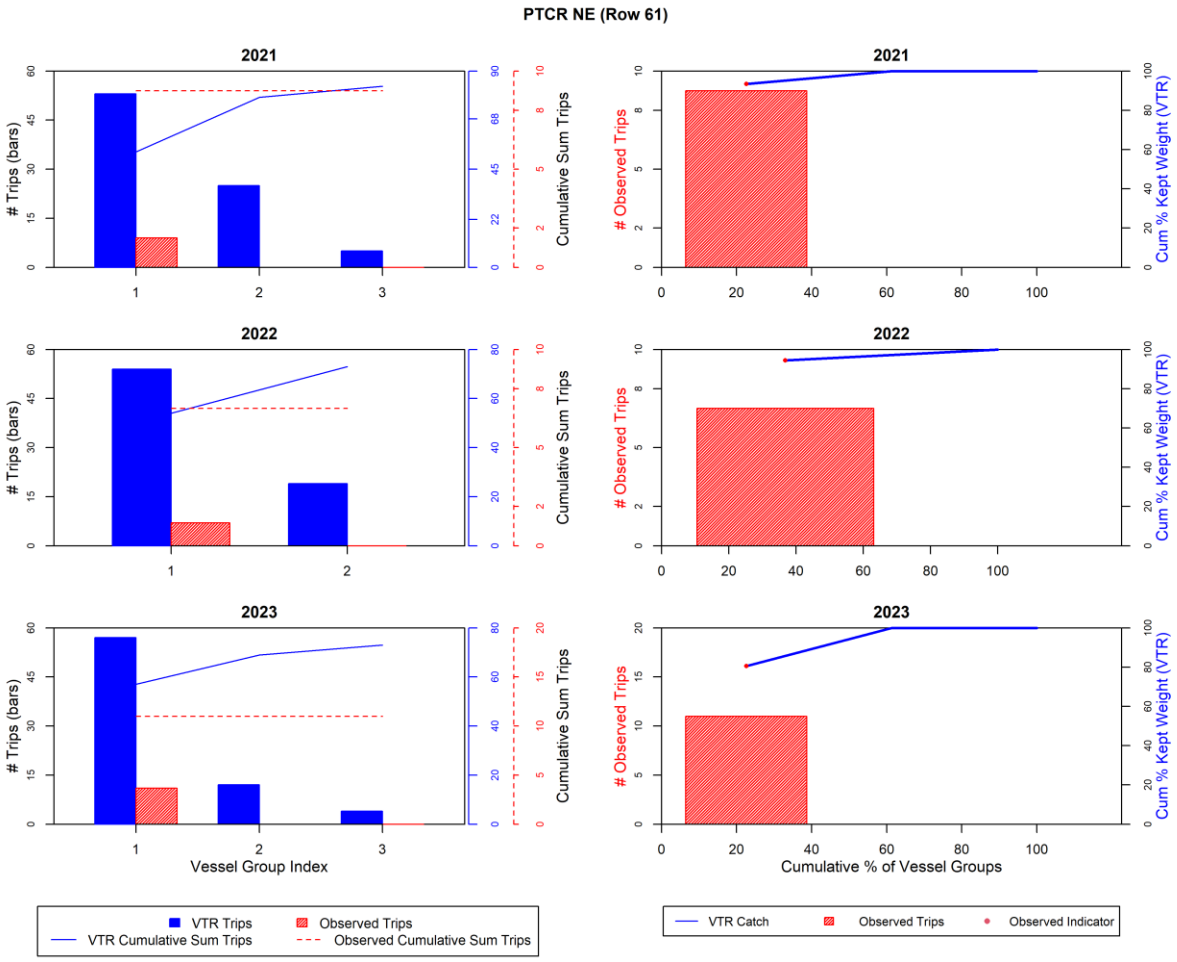

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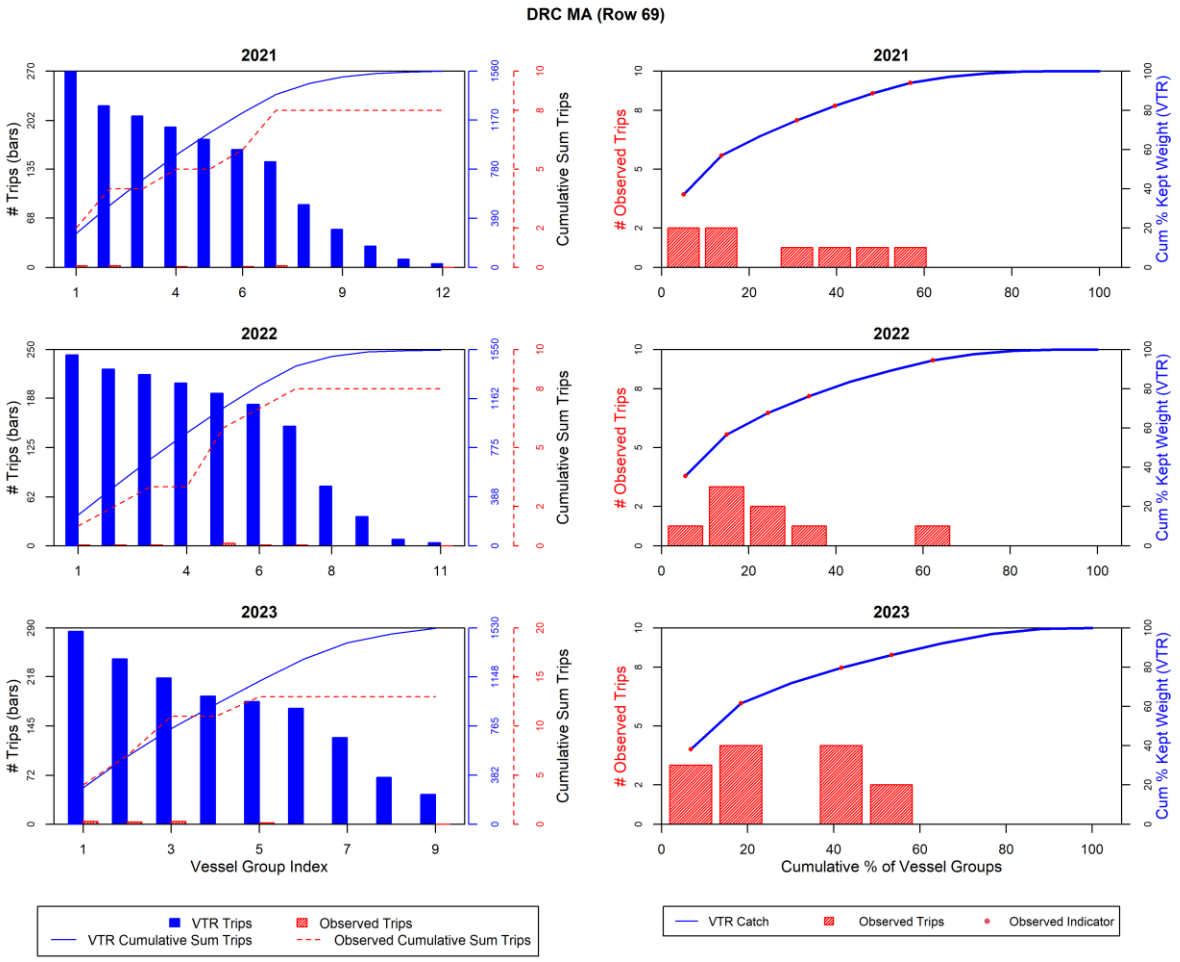
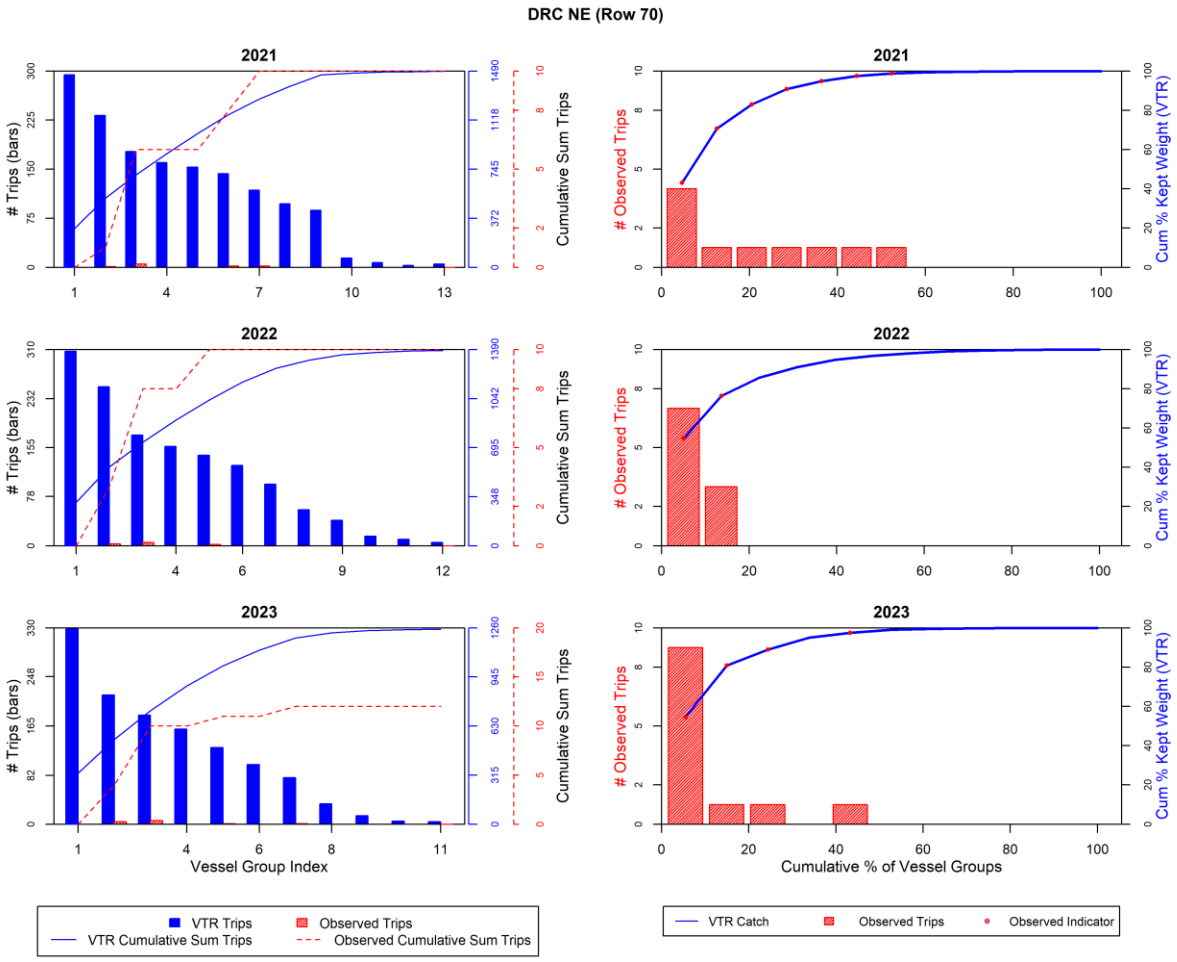


Figure 16, continued. Number of trips (bars; left-hand plots) by vessel group and their cumulative sum by data set (Vessel Trip Report [VTR] as blue solid line and observer [Observed] as red dashed line) and the cumulative percentage of kept weight of all species on VTR trips by vessel group (right-hand plots) for 1 of 31 selected fleets, by Standardized Bycatch Reporting Methodology (SBRM) year for SBRM 2021 (July 2019 through June 2020 data), SBRM 2022 (July 2020 through June 2021 data), and SBRM 2023 (July 2021 through June 2022 data). See Appendix Table 1 for fleet name abbreviations.



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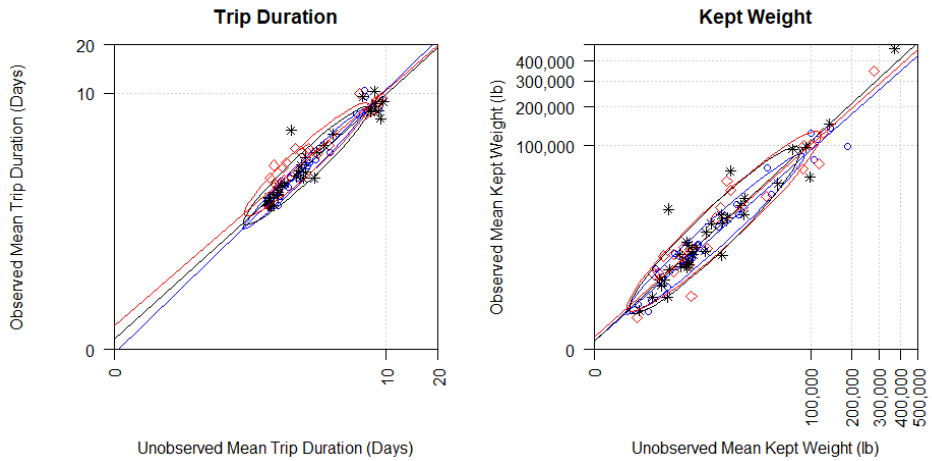

Figure 17. Comparison of mean trip duration (days; left) and mean kept weight of all species (live weight, lb; right) for unobserved and observed Vessel Trip Report trips for Standardized Bycatch Reporting Methodology (SBRM) 2021 (July 2019 through June 2020 data; blue circle), SBRM 2022 (July 2020 through June 2021 data; red diamond), and SBRM 2023 (July 2021 through June 2022 data; black star). A fourth root transformation was used. Each symbol represents the mean of an individual stratum (SBRM year and fleet); ellipse represents the 68% confidence interval for each SBRM year.

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APPENDIX TABLES

Appendix Table 1. List of fleets, fleet name abbreviations, and row numbers used in the 2021, 2022, and 2023 annual Standardized Bycatch Reporting Methodology (SBRM) analyses and the row numbers used in this report (2023 3-year Review). See Table 4 for fleet stratification abbreviations.

Fleet Gear Type	Access	Trip	Region	Mesh	Fleet Name Abbreviation	Row Number			
						SBRM 2021	SBRM 2022	SBRM 2023	2023 3-year Review
Longline, Bottom	OPEN	all	MA	all	LLB MA	1	1	1	1
Longline, Bottom	OPEN	all	NE	all	LLB NE	2	2	2	2
Hand Line	OPEN	all	MA	all	HL MA	3	3	3	3
Hand Line	OPEN	all	NE	all	HL NE	4	4	4	4
Otter Trawl	OPEN	all	MA	sm	OT sm MA	5	5	5	5
Otter Trawl	OPEN	all	MA	lg	OT lg MA	6	6	6	6
Otter Trawl	OPEN	all	NE	sm	OT sm NE	7	7	7	7
Otter Trawl	OPEN	all	NE	lg	OT lg NE	8	8	8	8
Otter Trawl, Scallop	AA	GEN	MA	lg	OTSC AA GEN lg MA	9	10		9
Otter Trawl, Scallop	OPEN	GEN	MA	lg	OTSC OPEN GEN lg MA	10	11	12	10
Otter Trawl, Twin	OPEN	all	MA	sm	OTT sm MA	11	12	13	11
Otter Trawl, Twin	OPEN	all	MA	lg	OTT lg MA	12	13	14	12
Otter Trawl, Twin	OPEN	all	NE	sm	OTT sm NE	13	14	15	13
Otter Trawl, Ruhle	OPEN	all	MA	sm	OTR sm MA	14	15	16	14
Otter Trawl, Ruhle	OPEN	all	MA	lg	OTR lg MA		16	17	15
Otter Trawl, Ruhle	OPEN	all	NE	sm	OTR sm NE	15	17	18	16
Otter Trawl, Ruhle	OPEN	all	NE	lg	OTR lg NE			19	17
Otter Trawl, Haddock Separator	OPEN	all	NE	sm	OTH sm NE		18	20	18
Otter Trawl, Haddock Separator	OPEN	all	NE	lg	OTH lg NE	16	19	21	19
Otter Trawl, Shrimp	OPEN	all	MA	sm	OTSH sm MA	17	20	22	20
Otter Trawl, Shrimp	OPEN	all	NE	sm	OTSH sm NE	18			21
Otter Trawl, Other	OPEN	all	MA	sm	OTO sm MA	19	21	23	22
Otter Trawl, Other	OPEN	all	MA	lg	OTO lg MA		22	24	23
Otter Trawl, Other	OPEN	all	NE	sm	OTO sm NE	20	23	25	24
Otter Trawl, Other	OPEN	all	NE	lg	OTO lg NE	21	24	26	25
Haul Seine, Beach	OPEN	all	NE	all	HSB NE			27	26
Floating Trap	OPEN	all	MA	all	FT MA	22		28	27
Floating Trap	OPEN	all	NE	all	FT NE	23	25	29	28
Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	GN sm MA	24	26	30	29
Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	GN lg MA	25	27	31	30
Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	GN xlg MA	26	28	32	31
Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	GN sm NE	27	29	33	32
Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	GN lg NE	28	30	34	33
Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	GN xlg NE	29	31	35	34
Purse Seine	OPEN	all	MA	all	PS MA	30	32	36	35

Fleet Gear Type	Access	Trip	Region	Mesh	Fleet Name Abbreviation	Row Number SBRM 2021	SBRM 2022	SBRM 2023	2023 3-year Review
Purse Seine	OPEN	all	NE	all	PS NE	31	33	37	36
Dredge, Scallop	AA	GEN	MA	all	DRSC AA GEN MA	32	34	38	37
Dredge, Scallop	AA	GEN	NE	all	DRSC AA GEN NE	33	35	39	38
Dredge, Scallop	AA	LIM	MA	all	DRSC AA LIM MA	34	36	40	39
Dredge, Scallop	AA	LIM	NE	all	DRSC AA LIM NE	35	37	41	40
Dredge, Scallop	OPEN	GEN	MA	all	DRSC OPEN GEN MA	36	38	42	41
Dredge, Scallop	OPEN	GEN	NE	all	DRSC OPEN GEN NE	37	39	43	42
Dredge, Scallop	OPEN	LIM	MA	all	DRSC OPEN LIM MA	38	40	44	43
Dredge, Scallop	OPEN	LIM	NE	all	DRSC OPEN LIM NE	39	41	45	44
Otter Trawl, LgMesh Belly Panel	OPEN	all	MA	lg	OTLMB lg MA			9	45
Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	sm	OTLMB sm NE		9	10	46
Otter Trawl, LgMesh Belly Panel	OPEN	all	NE	lg	OTLMB lg NE			11	47
Trawl, Midwater	all	all	NE	sm	TMW all sm NE	40	42	46	48
Trawl, Midwater	OPEN	all	MA	sm	TMW OPEN sm MA	41	43		49
Pots and Traps, Other	OPEN	all	MA	all	PTO MA		44		50
Pots and Traps, Other	OPEN	all	NE	all	PTO NE	42	45	47	51
Pots and Traps, Fish	OPEN	all	MA	all	PTF MA	43	46	48	52
Pots and Traps, Fish	OPEN	all	NE	all	PTF NE	44	47	49	53
Pots and Traps, Eel	OPEN	all	NE	all	PTE NE			50	54
Pots and Traps, Conch	OPEN	all	MA	all	PTC MA	45	48	51	55
Pots and Traps, Conch	OPEN	all	NE	all	PTC NE	46	49	52	56
Pots and Traps, Hagfish	OPEN	all	NE	all	PTH NE	47	50		57
Pots and Traps, Lobster	OPEN	all	MA	all	PTL MA	48	51	53	58
Pots and Traps, Lobster	OPEN	all	NE	all	PTL NE	49	52	54	59
Pots and Traps, Crab	OPEN	all	MA	all	PTCR MA	50	53		60
Pots and Traps, Crab	OPEN	all	NE	all	PTCR NE	51	54	55	61
Beam Trawl	OPEN	all	MA	sm	BT sm MA	52	55	56	62
Beam Trawl	OPEN	all	NE	sm	BT sm NE			57	63
Beam Trawl	OPEN	all	NE	lg	BT lg NE			58	64
Scottish Seine	OPEN	all	MA	sm	SS sm MA			59	65
Dredge, Other	OPEN	all	MA	all	DRO MA	53	56	60	66
Dredge, Other	OPEN	all	NE	all	DRO NE	54	57	61	67
Dredge, Mussel	OPEN	all	NE	all	DRM NE		58	62	68
Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	DRC MA	55	59	63	69
Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	DRC NE	56	60	64	70

Appendix Table 2. Individual species (in alphabetical order) encountered on observed trips from July 2019 through June 2022. Individual species listed reflects the unique species codes of living and nonliving matter used by observers. Common and scientific names are taken directly from the Observer Database System. Some species have not been identified to the species level, such as starfish, sponge, and sea cucumbers. There are some cases when species cannot be positively identified and are recorded as a species group not known (e.g., "flounder, NK"). Only non-confidential records are shown.

Common Name	Scientific Name
ALEWIFE	ALOSA PSEUDOHARENGUS
AMBERJACK, NK	SERIOLA
ANCHOVY, BAY	ANCHOA MITCHILLI
ANCHOVY, NK	ENGRAULIDAE
ANEMONE, NK	ANTHOZOA
ARGENTINE, ATLANTIC	ARGENTINA SILUS
ATLANTIC SOFT POUT	MELANOSTIGMA ATLANTICUM
BARRACUDA, NK	SPHYRAENIDAE
BARRELFISH	HYPEROGLYPHE PERCIFORMIS
BASS, STRIPED	MORONE SAXATILIS
BEARDFISH	POLYMIXIA LOWEI
BIRD, NK	AVES
BLUEFISH	POMATOMUS SALTATRIX
BOARFISH, DEEPBODY	ANTIGONIA CAPROS
BONE, NK	BONES
BONITO, ATLANTIC	SARDA SARDA
BULLET MACKEREL	AUXIS ROCHEI
BUTTERFISH	PEPRILUS TRIACANTHUS
CLAM, NK	BIVALVIA
CLAM, RAZOR	ENSIS DIRECTUS
CLAM, SURF	SPISULA SOLIDISSIMA
CLAPPER, CLAM	
CLAPPER, NK	
CLAPPER, OCEAN QUAHOG	
CLAPPER, SCALLOP	
COBIA	RACHYCENTRON CANADUM
COD, ATLANTIC	GADUS MORHUA
CORAL, SOFT, NK	ALCYONACEA

Common Name	Scientific Name
CRAB, BLUE	CALLINECTES SAPIDUS
CRAB, CANCER, NK	CANCER
CRAB, CANCER, NK (MARKET CLAWS)	CANCER
CRAB, DEEPSEA, RED	CHACEON QUINQUEDENS
CRAB, HERMIT, NK	PAGUROIDEA
CRAB, HORSESHOE	LIMULUS POLYPHEMUS
CRAB, JONAH	CANCER BOREALIS
CRAB, JONAH (MARKET CLAWS)	CANCER BOREALIS
CRAB, LADY	OVALIPES OCELLATUS
CRAB, NORTHERN STONE	LITHODES MAJA
CRAB, ROCK	CANCER IRRORATUS
CRAB, SNOW	CHIONOECETES OPILIO
CRAB, SPIDER, NK	MAJIDAE
CRAB, SPIDER, PORTLY	LIBINIA EMARGINATA
CRAB, TRUE, NK	BRACHYURA
CRABS, LOBSTER, SHRIMP, NK	DECAPODA
CROAKER, ATLANTIC	MICROPOGONIAS UNDULATUS
CRUSTACEAN, NK	CRUSTACEA
CUNNER (YELLOW PERCH)	TAUTOGOLABRUS ADSPERSUS
CUSK	BROSME BROSME
CUSK-EEL, NK	OPHIDIIDAE
CUTLASSFISH, ATL	TRICHIURUS LEPTURUS
DEBRIS, FISHING GEAR	FISHING GEAR DEBRIS
DEBRIS, GLASS	GLASS DEBRIS
DEBRIS, METAL	METAL DEBRIS
DEBRIS, NK	UNKNOWN DEBRIS
DEBRIS, PLASTIC	PLASTIC DEBRIS
DEBRIS, ROCK	ROCK DEBRIS
DEBRIS, WOOD	WOOD DEBRIS
DOGFISH, CHAIN	SCYLIORHINUS RETIFER
DOGFISH, NK	SQUALIDAE
DOGFISH, SMOOTH	MUSTELUS CANIS

Common Name	Scientific Name
DOGFISH, SPINY	SQUALUS ACANTHIAS
DOLPHIN, BOTTLENOSE	TURSIOPS TRUNCATUS
DOLPHIN, COMMON (OLD SADDLEBACK)	DELPHINUS DELPHIS (COMMON)
DOLPHIN, NK (MAMMAL)	DELPHINIDAE
DOLPHIN, RISSOS	GRAMPUS GRISEUS
DOLPHIN, WHITESIDED	LAGENORHYNCHUS ACUTUS
DOLPHINFISH (MAHI MAHI)	CORYPHAENA
DORY, BUCKLER (JOHN)	ZENOPSIS CONCHIFERA
DRUM, BANDED	LARIMUS FASCIATUS
DRUM, BLACK	POGONIAS CROMIS
DRUM, RED	SCIAENOPS OCELLATUS
ECHINODERM, NK	ECHINODERMATA
EEL, AMERICAN	ANGUILLA ROSTRATA
EEL, CONGER	CONGER OCEANICUS
EEL, NK	ANGUILLIFORMES
EEL, SLENDER SNIPE	NEMICHTHYS SCOLOPACEUS
EGGS, ELASMOBRANCH, NK	
EGGS, NK	
FILEFISH, NK	BALISTIDAE
FISH EGGS, NK	
FISH, NK	GNATHOSTOMATA
FLOUNDER, AMERICAN PLAICE	HIPPOGLOSSOIDES PLATESSOIDES
FLOUNDER, FOURSPOT	PARALICHTHYS OBLONGUS
FLOUNDER, GULFSTREAM	CITHARICHTHYS ARCTIFRONS
FLOUNDER, LEFTEYE, NK	BOTHIDAE
FLOUNDER, NK	PLEURONECTIFORMES
FLOUNDER, SUMMER (FLUKE)	PARALICHTHYS DENTATUS
FLOUNDER, WINDOWPANE (SAND DAB)	SCOPHTHALMUS AQUOSUS
FLOUNDER, WINTER (BLACKBACK)	PSEUDOPLEURONECTES AMERICANUS
FLOUNDER, WITCH (GREY SOLE)	GLYPTOCEPHALUS CYNOGLOSSUS
FLOUNDER, YELLOWTAIL	LIMANDA FERRUGINEA
GANNET, NORTHERN	SULA BASSANUS

Common Name	Scientific Name
GAPER, RED EYE	CHAUNAX STIGMAEUS
GRENADIER, COMMON (MARLINSPIKE)	NEZUMIA BAIRDII
GRENADIER, NK	MACROURIDAE
GROUNDFISH, NK	GADIFORMES
GROUPER, NK	SERRANIDAE
GULL, GREAT BLK-BACK	LARUS MARINUS
GULL, HERRING	LARUS ARGENTATUS
GULL, NK	LARIDAE
GUNNEL, ROCK	PHOLIS GUNNELLUS
HADDOCK	MELANOGRAMMUS AEGLEFINUS
HAGFISH, ATLANTIC	MYXINE GLUTINOSA
HAKE, LONGFIN	PHYCIS CHESTERI
HAKE, MIX RED/WHITE/SPOTD/SOUTHERN	UROPHYCIS
HAKE, MIX SILVER/OFFSHORE	MERLUCCIUS
HAKE, NK	GADIFORMES
HAKE, OFFSHORE (WHITING, BLACK)	MERLUCCIUS ALBIDUS
HAKE, RED (LING)	UROPHYCIS CHUSS
HAKE, SILVER (WHITING)	MERLUCCIUS BILINEARIS
HAKE, SPOTTED	UROPHYCIS REGIA
HAKE, WHITE	UROPHYCIS TENUIS
HALIBUT, ATLANTIC	HIPPOGLOSSUS HIPPOGLOSSUS
HALIBUT, GREENLAND	REINHARDTIUS HIPPOGLOSSOIDES
HARVESTFISH	PEPRILUS ALEPIDOTUS
HERRING, ATLANTIC	CLUPEA HARENGUS
HERRING, ATLANTIC THREAD	OPISTHONEMA OGLINUM
HERRING, BLUEBACK	ALOSA AESTIVALIS
HERRING, NK	CLUPEIDAE
HERRING, RIVER	ALOSA
HOGCHOCKER	TRINECTES MACULATUS
INVERTEBRATE, NK	ANIMALIA
JACK, CREVALLE	CARANX HIPPOS
JACK, NK	CARANGIDAE

Common Name	Scientific Name
JELLYFISH, NK	SCYPHOZOA
KINGFISH, GULF	MENTICIRRHUS LITTORALIS
KINGFISH, NK	MENTICIRRHUS
KINGFISH, NORTHERN	MENTICIRRHUS SAXATILIS
KINGFISH, SOUTHERN	MENTICIRRHUS AMERICANUS
LAMPREY, NK	PETROMYZONTIDAE
LANTERNFISH, NK	MYCTOPHIDAE
LIZARDFISH	SYNODONTIDAE
LOBSTER, AMERICAN	HOMARUS AMERICANUS
LOOKDOWN	SELENE VOMER
LOON, COMMON	GAVIA IMMER
LOON, RED-THROATED	GAVIA STELLATA
LUMPFISH	CYCLOPTERUS LUMPUS
MACKEREL, ATLANTIC	SCOMBER SCOMBRUS
MACKEREL, ATLANTIC CHUB	SCOMBER COLIAS
MACKEREL, FRIGATE	AUXIS THAZARD
MACKEREL, KING	SCOMBEROMORUS CAVALLA
MACKEREL, NK	SCOMBER
MACKEREL, SNAKE, NK	GEMPYLIDAE
MACKEREL, SPANISH	SCOMBEROMORUS MACULATUS
MENHADEN, ATLANTIC	BREVOORTIA TYRANNUS
MOLA, NK	MOLIDAE
MOLA, OCEAN SUNFISH	MOLA MOLA
MOLLUSCA EGGS, NK	
MOLLUSK, NK	MOLLUSCA
MONKFISH (GOOSEFISH)	LOPHIUS AMERICANUS
MOONFISH, ATLANTIC	SELENE SETAPINNIS
MURRE, THIN-BILLED	URIA AALGE
MUSSEL, NK	MYTILUS EDULIS
OCEAN POUT	ZOARCES AMERICANUS
OCTOPUS, NK	OCTOPODIDAE
OYSTER, COMMON	CRASSOSTREA VIRGINICA

Common Name	Scientific Name
PIGFISH	ORTHOPRISTIS CHRYSOPTERA
PINFISH	LAGODON RHOMBOIDES
PIPEFISH/SEAHORSE, NK	SYNGNATHIDAE
POLLOCK	POLLACHIUS VIRENS
POMPANO, FLORIDA	TRACHINOTUS CAROLINUS
PORPOISE, HARBOR	PHOCOENA PHOCOENA
PUFFER, NK (BURRFISH)	SPHOEROIDES
PUFFER, NORTHERN	SPHOEROIDES MACULATUS
QUAHOG, HARD SHELL CLAM	MERCENARIA MERCENARIA
QUAHOG, OCEAN (BLACK CLAM)	ARCTICA ISLANDICA
RAVEN, SEA	HEMITRIPTERUS AMERICANUS
RAY, BULLNOSE	MYLIOBATIS FREMINVILLEI
RAY, BUTTERFLY, SMOOTH	GYMNURA MICRURA
RAY, BUTTERFLY, SPINY	GYMNURA ALTAVELA
RAY, COWNOSE	RHINOPTERA BONASUS
RAY, NK	RAJIFORMES
RAY, TORPEDO	TORPEDO NOBILIANA
REDFISH, ACADIAN	SEBASTES FASCIATUS
REMORA, NK	ECHENEIDAE
RIBBONFISH, NK	TRACHIPTERIDAE
ROCKLING, FOURBEARD	ENCHELYOPUS CIMBRIUS
ROSEFISH, BLACK BELLY	HELICOLENUS DACTYLOPTERUS
ROUGHY, BIG	GEPHYROBERYX DARWINI
ROUGHY, NK	TRACHICHTHYIDAE
RUNNER, BLUE	CARANX CRYSOS
SAND DOLLAR	ECHINARACHNIUS PARMA
SAND LANCE, NK	AMMODYTES
SAURY, ATLANTIC	SCOMBERESOX SAURUS
SCAD, BIGEYE	SELAR CRUMENOPHTHALMUS
SCAD, ROUGH	TRACHURUS LATHAMI
SCALLOP, BAY	ARGOPECTEN IRRADIANS
SCALLOP, ICELANDIC	CHLAMYS ISLANDICA

Common Name	Scientific Name
SCALLOP, NK	PECTINIDAE
SCALLOP, SEA	PLACOPECTEN MAGELLANICUS
SCORPIONFISH, NK	SCORPAENIDAE
SCULPIN, LONGHORN	MYOXOCEPHALUS OCTODECIMSPINOSUS
SCULPIN, NK	COTTIDAE
SCUP	STENOTOMUS CHRYSOPS
SEA BASS, BLACK	CENTROPRISTIS STRIATA
SEA BASS, NK	CENTROPRISTIS
SEA CUCUMBER, NK	HOLOTHUROIDEA
SEA PEN, NK	PENNATULACEA
SEA ROBIN, ARMORED	PERISTEDION MINIATUM
SEA ROBIN, NK	TRIGLIDAE
SEA ROBIN, NORTHERN	PRIONOTUS CAROLINUS
SEA ROBIN, STRIPED	PRIONOTUS EVOLANS
SEA SQUIRT, NK	ASCIDIACEA
SEA URCHIN, NK	STRONGYLOCENTROTUS
SEAL, GRAY	HALICHOERUS GRYPUS
SEAL, HARBOR	PHOCA VITULINA CONCOLOR
SEAL, NK	PHOCIDAE
SEATROUT, SPOTTED	CYNOSCION NEBULOSUS
SEAWEED, NK	PHAEOPHYTA
SHAD, AMERICAN	ALOSA SAPIDISSIMA
SHAD, HICKORY	ALOSA MEDIOCRIS
SHARK, ATL ANGEL	SQUATINA DUMERIL
SHARK, ATL SHARPNOSE	RHIZOPRIONODON TERRAENOVAE
SHARK, BASKING	CETORHINUS MAXIMUS
SHARK, BLACK TIP	CARCHARHINUS LIMBATUS
SHARK, BLUE (BLUE DOG)	PRIONACE GLAUCA
SHARK, CARCHARHINID, NK	CARCHARHINUS
SHARK, DUSKY	CARCHARHINUS OBSCURUS
SHARK, HAMMERHEAD, NK	SPHYRNIDAE
SHARK, HAMMERHEAD, SCALLOPED	SPHYRNA LEWINI

Common Name	Scientific Name
SHARK, MAKO, SHORTFIN	ISURUS OXYRINCHUS
SHARK, NK	CHONDRICHTHYES
SHARK, PELAGIC	LAMNIFORMES
SHARK, PORBEAGLE (MACKEREL SHARK)	LAMNA NASUS
SHARK, SAND TIGER	CARCHARIAS TAURUS
SHARK, SANDBAR (BROWN SHARK)	CARCHARHINUS PLUMBEUS
SHARK, SILKY	CARCHARHINUS FALCIFORMIS
SHARK, SPINNER	CARCHARHINUS BREVIPINNA
SHARK, THRESHER	ALOPIAS VULPINUS
SHARK, TIGER	GALEOCERDO CUVIER
SHARK, WHITE	CARCHARODON CARCHARIAS
SHEARWATER, GREATER	PUFFINUS GRAVIS
SHEARWATER, SOOTY	PUFFINUS GRISEUS
SHEEPSHEAD	ARCHOSARGUS PROBATOCEPHALUS
SHELL, NK	SHELL
SHELL, SCALLOP	
SHRIMP, MANTIS	STOMATOPODA
SHRIMP, NK	CARIDEA
SHRIMP, PANDALID (NORTHERN)	PANDALUS BOREALIS
SHRIMP, PENAEID (SOUTHERN)	PENAEIDAE
SILVERSIDE, ATLANTIC	MENIDIA MENIDIA
SKATE, BARNDOOR	DIPTURUS LAEVIS
SKATE, CLEARNOSE	RAJA EGLANTERIA
SKATE, LITTLE	LEUCORAJA ERINACEA
SKATE, LITTLE/WINTER, NK	LEUCORAJA
SKATE, NK	RAJIDAE
SKATE, ROSETTE	LEUCORAJA GARMANI
SKATE, SMOOTH	MALACORAJA SENTA
SKATE, THORNY	RAJA RADIATA
SKATE, WINTER (BIG)	RAJA OCELLATA
SNAIL, MOONSHELL, NK	NATICIDAE
SNAIL, NK	GASTROPODA

Common Name	Scientific Name
SNAKEBLENNY	LUMPENUS LUMPRETAEFORMIS
SNAPPER, NK	LUTJANIDAE
SNIPEFISH, LONGSPINE	MACRORAMPHOSUS SCOLOPAX
SNIPEFISH, NK	SYNGNATHOIDEI
SPADEFISH	EPHIPPIDIDAE
SPONGE, NK	PORIFERA
SPOT	LEIOSTOMUS XANTHURUS
SQUID EGGS, ATL LONG-FIN	LOLIGO PEALEII
SQUID, ATL LONG-FIN	LOLIGO PEALEII
SQUID, NK	LOLIGINIDAE
SQUID, SHORT-FIN	ILLEX ILLECEBROSUS
STARFISH, BRITTLE, NK	OPHIUROIDEA
STARFISH, SEASTAR, NK	ASTEROIDEA
STARGAZER, NK	URANOSCOPIDAE
STARGAZER, NORTHERN	ASTROSCOPUS GUTTATUS
STINGRAY, BLUNTNOSE	DASYATIS SAY
STINGRAY, NK	DASYATIDAE
STINGRAY, ROUGHTAIL	DASYATIS CENTROURA
STURGEON, ATLANTIC	ACIPENSER OXYRINCHUS
STURGEON, NK	ACIPENSERIDAE
SWORDFISH	XIPHIAS GLADIUS
TAUTOG (BLACKFISH)	TAUTOGA ONITIS
TILEFISH, BLUELINE	CAULOLATILUS MICROPS
TILEFISH, GOLDEN	LOPHOLATILUS CHAMAELEONTICEPS
TILEFISH, NK	MALACANTHIDAE
TOADFISH, OYSTER	OPSANUS TAU
TRIGGERFISH, NK (LEATHERJACKET)	BALISTIDAE
TUNA, BIG EYE	THUNNUS OBESUS
TUNA, BLUEFIN	THUNNUS THYNNUS
TUNA, LITTLE (FALSE ALBACORE)	EUTHYNNUS ALLETTERATUS
TUNA, NK	THUNNUS
TUNA, YELLOWFIN	THUNNUS ALBACARES

Common Name	Scientific Name
TURTLE, LOGGERHEAD	CARETTA CARETTA
UNKOWN LIVING MATTER	
WEAKFISH (SQUETEAGUE SEA TROUT)	CYNOSCION REGALIS
WHALE, PILOT, NK	GLOBICEPHALA
WHELK, CHANNELED (SMOOTH)	BUSYCOTYPUS CANALICULATUS
WHELK, KNOBBED	BUSYCON CARICA
WHELK, MELONGENIDAE, NK	MELONGENIDAE
WHELK, TRUE UNC	BUCCINIDAE
WOLFFISH, ATLANTIC	ANARHICHAS LUPUS
WORM, POLYCHAETA, NK	POLYCHAETA
WRYMOUTH	CRYTACANTHODES MACULATUS

Appendix Table 3. Discard reason categories used and the associated discard fish dispositions. Fish disposition descriptions taken directly from the Observer Database System.

Discard Reason Category	FISH DISPOSITION Code	FISH DISPOSITION Description
No Market	001	NO MARKET, REASON NOT SPECIFIED
	002	NO MARKET, TOO SMALL
	003	NO MARKET, TOO LARGE
	005	NO MARKET, WONT KEEP UNTIL TRIP END
	006	NO MARKET, BUT RETAINED BY VESSEL FOR ALTERNATE PROGRAM
	007	NO MARKET, BUT RETAINED FOR OBSERVER FOR SCIENTIFIC PURPOSES
	008	NO MARKET, BROUGHT ONBOARD ONLY FOR THE PURPOSE OF OBSERVER SAMPLING
Regulation (Size)	012	REGULATIONS PROHIBIT RETENTION, TOO SMALL
	013	REGULATIONS PROHIBIT RETENTION, TOO LARGE
Regulation (Quota)	004	NO MARKET, QUOTA FILLED
	014	REGULATIONS PROHIBIT RETENTION, QUOTA FILLED
	015	REGULATIONS PROHIBIT RETENTION, NO QUOTA IN AREA
	025	REGULATIONS PROHIBIT ANY RETENTION
Regulation (Other)	009	DISCARDED, FEMALE
	011	REGULATIONS PROHIBIT RETENTION, REASON NOT SPECIFIED
	022	REGULATIONS PROHIBIT RETENTION, V-NOTCHED
	023	REGULATIONS PROHIBIT RETENTION, SOFT-SHELL
	024	REGULATIONS PROHIBIT RETENTION, WITH EGGS
Poor Quality	030	POOR QUALITY, GRAY MEAT/PARASITES OBSERVED
	031	POOR QUALITY, REASON NOT SPECIFIED
	032	POOR QUALITY, SAND FLEA DAMAGE
	033	POOR QUALITY, SEAL DAMAGE
	034	POOR QUALITY, SHARK DAMAGE
	035	POOR QUALITY, CETACEAN DAMAGE
	036	POOR QUALITY, HAGFISH DAMAGE
	037	POOR QUALITY, SHELL DISEASE

Note: Fish disposition codes “039” = POOR QUALITY, PREVIOUSLY DISCARDED and “090” = DISCARDED BY OBSERVER, INTENDED KEPT CATCH have been excluded from this report.

	038	POOR QUALITY, GEAR DAMAGE
Other	000	DISCARDED, UNKNOWN REASON
	040	NOT BROUGHT ON BOARD, OPERATIONAL DISCARDS
	041	NOT BROUGHT ON BOARD, REASON NOT SPECIFIED
	042	NOT BROUGHT ON BOARD, GEAR DAMAGE PREVENTED CAPTURE
	043	NOT BROUGHT ON BOARD, FELL OUT/OFF OF GEAR
	044	NOT BROUGHT ON BOARD, CONSIDERED TO HAVE NO MARKET VALUE
	045	NOT BROUGHT ON BOARD, SAFETY REASON
	046	NOT BROUGHT ON BOARD, MECHANICAL FAILURE
	047	NOT BROUGHT ON BOARD, SPINY DOG CLOGGING PUMP
	048	NOT BROUGHT ON BOARD, VESSEL CAPACITY FILLED
	049	NOT BROUGHT ON BOARD, NOT ENOUGH FISH TO PUMP ABOARD
	052	INCIDENTAL TAKE (MAMMAL, SEA TURTLE, SEA BIRD)
	053	DEBRIS
	054	EMPTY SHELLS
	062	UPGRADED
	063	RETAINING ONLY CERTAIN SIZE BETTER PRICE TRIP QUOTA IN EFFECT
	064	RETAINING ONLY CERTAIN SIZE FOR BEST PRICE BECAUSE OF PRICE DIFFERENCE
	070	NOT BROUGHT ON BOARD, QUALITY OF FISH
	071	NOT BROUGHT ON BOARD, CLOGGED PUMP OTHER
	099	DISCARDED, OTHER

Note: Fish disposition codes “039” = POOR QUALITY, PREVIOUSLY DISCARDED and “090” = DISCARDED BY OBSERVER, INTENDED KEPT CATCH have been excluded from this report.

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Society's guides, and the Society for Marine Mammalogy's guide for verifying scientific species names.

For in-text citations, use the name-date system. A special effort should be made to ensure all necessary bibliographic information is included in the list of references cited. Personal communications must include the date, full name, and full mailing address of the contact.

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