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2021 Observer Sea Days by Trip Selection System

US DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts
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by the Northeast Fisheries Science Center

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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 completed both technical and policy reviews for this report. These predissemination reviews are on file at the NEFSC Editorial Office.

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

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LIST OF ACRONYMS AND ABBREVIATIONS

AA = access area
ASM = At-Sea Monitoring Program
CV = coefficient of variation
EFP = Exempted Fishing Permit
FMP = fishery management plan
FMO = Fisheries Monitoring and Operations Branch
GEN = general category
HERR = Atlantic herring FMP
HER = VMS plan code for Atlantic herring
IFM = industry-funded monitoring
IFS = Industry Funded Scallop
IVR = interactive voice response
lg = large mesh
LIM = limited access category
MA = Mid-Atlantic
MAFMC = Mid-Atlantic Fishery Management Council
MMPA = Marine Mammal Protection Act
NE = New England
NEFMC = New England Fishery Management Council
NEFOP = Northeast Fisheries Observer Program
NEFSC = Northeast Fisheries Science Center
NMFS = National Marine Fisheries Service
NMS = Northeast Multispecies
NOAA = National Oceanic and Atmospheric Administration
OB = observed or observer
OBDBS = Observer Database System
OPEN = nonaccess area
PTNS = Pre-Trip Notification System
SBRM = Standardized Bycatch Reporting Methodology
sm = small mesh
US = United States
VMS = Vessel Monitoring System
VTR = Vessel Trip Report
xlg = extra large mesh

EXECUTIVE SUMMARY

The Northeast Fisheries Science Center's Fisheries Monitoring and Operations Branch (FMO) currently manages 4 observer programs and 3 systems to select commercial fishing trips in the Greater Atlantic Region for observer coverage. The 4 observer programs are: the Northeast Fisheries Observer Program (NEFOP), the At-Sea Monitoring (ASM) program, the Industry Funded Scallop (IFS) observer program, and in July 2021, FMO will manage a fourth observer program, Industry-Funded Monitoring (IFM), following requirements of the New England Fishery Management Council's (NEFMC) Industry-Funded Monitoring Omnibus Amendment to the Atlantic herring fishery management plan (IFM HERR). The 3 selection systems are: the NEFOP Sea Day Schedule selection protocols (includes trip selection by phone, email, letter, Vessel Monitoring System [VMS] message, or in person at the dock communication [dock intercept]), the Pre-Trip Notification System (PTNS), and an automated Interactive Voice Response system (IVR).

There are 5,569 observer sea days allocated for April 2021 through March 2022 to assess the amount and type of bycatch of fish, invertebrates, sea turtles, and marine mammals in the region. There are 2 funding source categories for the observer sea days: National Marine Fisheries Service funding (Standardized Bycatch Reporting Methodology [SBRM] and the Marine Mammal Protection Act [MMPA] sampling designs) and industry funding (Atlantic sea scallop fishery management plan [FMP] IFS, Northeast Multispecies [NMS] FMP ASM, and the IFM HERR sampling designs).

There are 3,248 SBRM NEFOP sea days, of which 2,485 sea days are apportioned to the Sea Day Schedule and 763 sea days are apportioned to the PTNS. Of the 763 SBRM NEFOP PTNS sea days, 699 sea days are assigned to fleets with NMS FMP pretrip notification requirements and 64 sea days are assigned to fleets with the IFM HERR pretrip notification requirements which were implemented in April 2020. There are 1,856 IFS sea days assigned to the IVR for IFS fleets. There are 465 MMPA-funded sea days. Of the 465 MMPA days, 175 days are assigned for observer coverage with 30 of those days assigned to PTNS and 145 assigned to the Sea Day Schedule. There are 290 MMPA days that are not assigned as they will be days for analysis.

This document describes the methods used to identify and apportion the observer sea days among selection systems, presents the numbers of sea days by fleet and selection system, and outlines the expected observer coverage by fleet provided by the SBRM NEFOP PTNS sea days. The expected contributions of SBRM NEFOP PTNS sea days toward the 2 FMP-specific industry-funded monitoring total combined targets are approximate and derived based on previous Vessel Trip Report activity. The NMS FMP industry-funded monitoring target requirement is a combination of SBRM NEFOP sea days and ASM realized coverage. The IFM HERR FMP industry-funded monitoring target requirement is a combination of SBRM NEFOP sea days and IFM HERR realized coverage. The expected observer coverage values by fleet are used to inform the initial SBRM coverage rate settings within PTNS at the start of a sampling program. Once a sampling program is underway, coverage rates are monitored and adjusted as needed in order to optimize sea day accomplishments.

INTRODUCTION

The Northeast Fisheries Science Center's (NEFSC) Fisheries Monitoring and Operations Branch (FMO) currently manages 4 separate but related observer programs and 3 systems to select commercial fishing trips in the Greater Atlantic Region (Maine to North Carolina) for observer coverage. These observer programs and selection systems support 5 sampling designs used in this region (Figure 1). Contracted or approved observer service provider companies hire and deploy observers in accordance with FMO protocols.

FMO, under federal contract with an observer service provider, manages the Northeast Fisheries Observer Program (NEFOP). NEFOP observers collect a broad range of data including information on all species by disposition (retained and discarded) that are encountered during a fishing trip as well as gear characteristics data and economic information. Biological samples are also collected in this program. NEFOP observers are deployed on commercial trips fishing in the Greater Atlantic Region to meet specified annual sea day requirements, as defined by the Standardized Bycatch Reporting Methodology (SBRM) sampling design or by the Marine Mammal Protection Act (MMPA) sampling design. The MMPA design utilizes the NEFOP sampling protocols on gillnet trips that are specific to protected species, referred as NEFOP Limited[1]. The objective of the NEFOP is to monitor bycatch of all species. Coverage for this observer program is set at specified sea day levels and not as a target percentage coverage. In order to select trips for NEFOP (and NEFOP Limited) coverage, FMO utilizes both the Pre-Trip Notification System (PTNS; Palmer et al. 2013) and NEFOP Sea Day Schedule selection protocols (trip selection by phone, email, letter, Vessel Monitoring System [VMS] message, or in person communication at the dock [dock intercept]).

FMO, working with approved observer service providers, also manages the At-Sea Monitoring (ASM) program. At-sea monitors collect information on all species by disposition (retained and discarded) that are encountered during a fishing trip. Biological samples are not collected in this program. At-sea monitors are deployed on groundfish sector vessels fishing on declared Northeast Multispecies (NMS) fishery management plan (FMP) trips. The main objective of this monitoring is to verify the areas fished and the kept and discarded components of catch by species and gear type to reliably estimate overall catch by sector vessels. The monitoring coverage is expressed as a set percentage coverage of trips as specified by the ASM sampling design. Selection for all ASM trips occurs through the PTNS. To facilitate deployment, vessel representatives are required to notify the observer program via the PTNS for groundfish trips a minimum of 48 hours in advance of trip sail time.

In addition, FMO, working with approved observer service providers, also manages the Industry Funded Scallop (IFS) observer program. IFS observers collect information on all species, by disposition (retained and discards) that are encountered during a fishing trip. Biological samples are also collected in this program. IFS observers are deployed on vessels fishing on declared Atlantic sea scallop FMP trips to meet sampling requirements specified by the IFS sampling design. The objective of the IFS program is to monitor the bycatch of finfish, to collect biological information to inform stock assessments, and to monitor any interactions of the scallop fishery with endangered or threatened species, such as sea turtles. This program also must meet the precision-based SBRM sampling requirements. The IFS observer program utilizes an automated

[1] On gillnet trips, sampling of discards is either "complete fish sampling" or "limited fish sampling" but not both on the same trip. The type of sampling is determined before the trip begins. See the NEFOP Operations manual for further details.

Interactive Voice Response (IVR) system to record information on a vessel's intent to fish for scallops on a trip. To facilitate deployment, vessel representatives are required to notify the observer program 72 hours in advance of fishing.

Finally, in July 2021, FMO will work with approved observer service providers to manage a fourth observer program following requirements of the New England Fishery Management Council's Industry-Funded Monitoring Omnibus Amendment (NMFS and NEFMC 2018). The amendment lays the foundation for future industry-funded monitoring (IFM) programs and describes the industry-funded monitoring requirement for the Atlantic herring (*Clupea harengus*) FMP (IFM HERR) total target of 50% of applicable herring trips. The total target is expressed as a percentage of realized effort that can be achieved by a combination of IFM HERR and SBRM NEFOP sea days. The objective of this coverage is to increase monitoring of the Atlantic herring fishery to assess the amount and type of catch and to more accurately estimate incidentally caught species with catch caps. The coverage will provide more information for management purposes. Trip selection for this program will occur with the PTNS. To facilitate deployment, vessel representatives are required to notify the observer program 48 hours in advance of a fishing trip. Vessels began PTNS notification requirements for the IFM HERR fishery on April 1, 2020.

Annually, the NEFSC determines the number of sea days required to assess the amount and type of bycatch in the Greater Atlantic Region as required by the Standardized Bycatch Reporting Methodology Omnibus Amendment for all Council-led regional FMPs (NEFMC, MAFMC, NMFS 2015). Because of the COVID-19 pandemic-related data gaps in observer data in 2020, a decision was made not to update the SBRM statistical analysis with incomplete 2020 data, but to use the results of the 2020 SBRM statistical analysis and incorporate the 2021 budget information and the 2021 scallop compensation rate analysis for the observer sea day allocation for April 2021 through March 2022. The 2021 SBRM Annual Discard Report with Observer Sea Day Allocation (NEFSC and GARFO 2021) summarizes the number of sea days allocated to each fleet[2] to achieve a given level of precision of the discard estimates for 14 federally-managed fish/invertebrate species groups and 1 sea turtle species for the upcoming year and the funding sources to support the observer sea days. The SBRM sampling requirements are funded by National Marine Fisheries Service (NMFS) for all fleets except scallop fleets which are funded by the scallop industry (described below). The annual discard report also summarizes the number of MMPA sea days that are allocated to New England (NE) and Mid-Atlantic (MA) gillnet fisheries to achieve a given level of precision for marine mammal bycatch estimates according to Rossman (2007). Because of sampling protocol differences, the MMPA sea days do not contribute toward SBRM or industry-funded monitoring requirements.

The Greater Atlantic Regional Fisheries Office (GARFO) and the NEFSC conduct an annual observer set-aside compensation rate analysis to set initial compensation rates for IFS fleets. The number of industry funded scallop sea days available for scallop fleets is determined by taking 1% of the total acceptable biological catch/annual catch limit set for the year. The Industry Funded Scallop Observer Program allows the vessels an increase in landings to help defray the costs of carrying an observer (i.e., the compensation rate). The sale of the additional scallops allocated to each boat supplies the funding for the at-sea costs of observer coverage[3]. Based upon projected landings and expected prices, the IFS program generates funds in support of discard monitoring of the scallop fleets. A compensation rate analysis was undertaken to support

[2] The SBRM groups trips into nonoverlapping fleets with a broad stratification scheme by using 5 classification variables (geographic region based on port of departure, gear type, mesh group, access area, and trip category).

[3] IFS shoreside costs are funded by NMFS.

observer coverage of the 11 industry funded scallop fleets in the 2021 SBRM (see GARFO scallop monitoring webpage[4] and the NEFSC's SBRM webpage[5]). The IFS sampling must meet the SBRM sampling requirements for scallop fleets via the observer set-aside or other scallop industry funds. The stratification used in the compensation rate analysis is specific to the scallop FMP and differs from the SBRM. Because of differences in stratification, the industry funded scallop sea days are not allocated to individual SBRM fleets but rather to groups of SBRM fleets that correspond to the stratification used in the compensation rate analysis. The IFS sampling levels are expressed in percentages of realized trips, and the accomplished sea days are tracked to meet both SBRM and IFS requirements.

Annually, GARFO conducts an analysis to determine the NMS FMP's monitoring requirements that are presented in Summary of Analyses Conducted to Determine At-Sea Monitoring Requirements for Multispecies Sectors FY2021 (GARFO 2021). This analysis utilizes the most recent 3 years of data that are averaged to smooth assumed random interannual fluctuations of the discard variability estimate for each stock (GARFO 2021). The total monitoring coverage rate is applied to each sector and is expected to achieve the required 30% coefficient of variation of the discard estimates for each NMS FMP stock for all sectors and gears combined while minimizing costs to the extent practicable. It is derived from an aggregate analysis that uses strata based on sector, gear, and stock area (GARFO 2021). In 2020, consideration of the bias analyses conducted by the Groundfish Plan Development Team also factored into the setting the 2020 monitoring coverage rate[6]. In 2021, in addition to the coefficient of variation (CV) analysis, consideration of the bias analyses developed by the Groundfish Plan Development Team, peer reviewed by a subpanel of the New England Fishery Management Council Scientific and Statistical Committee in 2019, also factored into setting the 2021 monitoring coverage rate. The total target at-sea monitoring requirement for groundfish trips (expressed as a percentage of realized effort) can be achieved by a combination of ASM and SBRM NEFOP sea days. NOAA Fisheries announced on January 26, 2021 that the total target at-sea monitoring coverage level is 40 percent of all groundfish sector trips subject to the at-sea program[7]. This target is consistent with the requirement to monitor sector operations and to reliably estimate overall catch to the extent practicable

In summary, the basis of the sampling requirements differs among SBRM, IFS, ASM, and IFM HERR sampling designs. The IFS and IFM HERR do not have precision-based sampling requirements. The IFS and IFM HERR are based on selected levels of monitoring. The SBRM and ASM have precision-based sampling requirements but are calculated and expressed differently. The SBRM has a set number of required sea days (not driven by realized industry effort) while the ASM, IFS, and IFM HERR requirements are expressed as a percentage of realized trips. Unlike the IFS, the industry-funded portions[8] of the monitoring requirements of ASM and IFM HERR do not contribute toward the SBRM requirement; however, the SBRM sea days contribute toward each of these total industry-funded target requirements (see Northeast Multispecies monitoring webpage; see IFM Omnibus Amendment).

[4] https://www.fisheries.noaa.gov/bulletin/atlantic-sea-scallop-fishery-default-management-measures-fishing-year-2021

[5] https://www.fisheries.noaa.gov/resource/data/annual-discard-reports-northeast

[6] See the January 28, 2020 NOAA Fisheries announcement for further details.

[7] See the January 26, 2021 NOAA Fisheries Announcement for further details

[8] In the past, NMFS has reimbursed some or the entire industry-funded portion of the total combined ASM target requirement. Regardless of funding source, industry-funding monitoring does not contribute toward SBRM requirements. The differences in sampling designs (i.e., stratification) could result in disproportional sampling within an SBRM fleet that could result in sampling bias.

In 2018, the PTNS was modified to allow the system to support multiple sampling programs with different sampling designs (e.g., SBRM, NEFOP, ASM). This change now allows NMFS to deploy SBRM coverage in the groundfish fleets consistent with the SBRM requirements. In past fishing years, the NMFS has distributed the SBRM coverage evenly across the fleets that contain declared groundfish trips, with each sector receiving approximately the same SBRM NEFOP coverage rate, subject to random variations between sectors. Starting May 1, 2019, SBRM NEFOP sea days are assigned at levels consistent with the fleet-based coverage prescribed by the SBRM. This change better ensures that the levels of SBRM NEFOP coverage meet SBRM regulatory requirements. Since SBRM fleets can experience varying levels of NEFOP coverage depending on the fleet composition of sectors and random variability in SBRM coverage among vessels within a fleet, some sectors will receive more NEFOP coverage than others. Hence, sectors may require differing amounts of ASM coverage to achieve the combined target coverage level.

The allocated observer sea days are apportioned among the 3 selection systems to select fishing trips for observer[9] coverage and track observer coverage to meet the SBRM sea days and target percentages of the IFS, ASM, and IFM HERR in fleets that can be composed of fishing trips operating under multiple FMPs (Figure 1). This document describes the methods used to identify and apportion the observer sea days among 3 selection systems and presents the numbers of observer sea days by fleet and selection system. The expected SBRM NEFOP observer coverage by fleet used in PTNS is also provided. The expected observer coverage values by fleet are used to inform the initial SBRM coverage rate settings within PTNS at the start of a sampling program. Once a sampling program is underway, coverage rates are monitored and adjusted as needed in order to optimize sea day accomplishments.

IDENTIFICATION OF FISHING TRIPS

The commercial fishing trips in the Vessel Trip Report (VTR) dataset used in the SBRM annual analysis and associated with FMPs that have pretrip notification requirements are identified by using information in the VTR database, permit database, and the VMS declaration codes[10] in the Allocation Management System database. The operational criteria used to identify VTR trips with pretrip notification requirements are:

- Atlantic Sea Scallop FMP's IVR requirements
    - Trips using either scallop trawl or scallop dredge (VTR gear codes "OTC," "DRS," "DTC," "DSC," and "DTS")

- Northeast Multispecies FMP's PTNS requirements
    - Trips using bottom trawl, longline, handline, fish pot, or gillnet gear, and
        - VMS plan code of "NMS";
        - VMS plan code of "MNK" and a nonsuppressed multispecies charge[11];

[9] "Observer" in this document refers to either observer or at-sea monitor.

[10] Details on VMS declaration codes are available online at GARFO's VMS webpage, and VTR gear codes are described in the VTR instructions.

[11] When a vessel declares a monkfish trip and also holds a Northeast multispecies permit, it is also charged as a multispecies trip and is subject to At-Sea Monitoring. When that vessel's multispecies "days-at-sea" balance runs out, the multispecies charge gets suppressed, and it is a "monkfish only" trip that is not subject to At-Sea Monitoring.

        - VMS plan code of "MNK" and program code indicating a sector or common pool trip.
    - Common pool trips fishing under a Limited Access handline permit category ("HA") and Common Pool trips fishing under a small vessel exemption permit category ("C") are not subject to pretrip notification requirements; these trips are excluded.

- Atlantic herring FMP's PTNS requirements
    - Vessel has a herring permit category of "A," "B," or "C" and trip has a VMS plan code of "HER" (not to be confused with the IFM HERR code) or "H" in program code
    - Vessel has a herring permit category of "E" and trip has a VMS plan code of "HER" or "H" in program code
    - Vessel has a herring permit category of "D" fished with midwater trawl gear (either VMS gear type of "M" [midwater trawl], or VTR gear code in ["OTM," "PTM"; midwater trawl and paired midwater trawl, respectively]), and VTR area code in statistical areas (460s, 510s, 520s, 540s, 560s)
    - Vessel has a herring permit category of "A," "B," "C," "D," or "E" and the trip has a VMS plan code of "HER" and a VMS program code of "CAR" (carrier), or vessel has an active Letter of Authorization (exemption type like "%HERRING CARRIER%")

For the Atlantic sea scallop FMP, all Limited Access and Limited Access General Category scallop trips are required to use the IVR. However, for the NMS FMP and the Herring FMP, trips with industry-funded monitoring requirements are a subset of trips identified above that have pretrip notification requirements. The NMS FMP does not require ASM for trips associated with the common pool nor sector trips with ASM exemptions (i.e., ASM requirements have been removed for a subset of the extra large mesh gillnet sector trips with low groundfish bycatch). The IFM HERR will require industry-funded monitoring for only declared herring trips by vessels holding permit "A" or "B" with the intent to land greater than or equal to 50 mt of herring.

PARTITIONING OBSERVER SEA DAYS AMONG SELECTION SYSTEMS

SBRM and IFS Observer Sea Days

Table 1 presents the number of observer sea days allocated in a fleet or fleet group for April 2021 through March 2022 (Column A; taken from Step 12, Table 6 in NEFSC and GARFO 2021), the associated number of observed trips (Column B), and the number of VTR days and trips (Columns C and D, respectively) from July 2018 through June 2019 (the dataset used in the 2020 and 2021 SBRM dataset; see Tables 2 and 3 in Wigley and Tholke 2020). The allocated observer sea days and trips can be translated into expected observer coverage (Columns E and F, respectively) by dividing the observer sea days (or trips) by the VTR sea days (or trips). The expected observer coverage percentages are provided for perspective only; they are not used for setting SBRM coverage in the current year. The expected observer coverage is based on the

previous year's data because future activity is not known; therefore, the expected observer percentages are conditional.

The observer sea days are apportioned to the appropriate trip selection system based on the proportion of trips within the fleet that have FMP pretrip notification requirements. When there is no pre trip notification requirement, the Sea Day Schedule is used. As mentioned above, the scallop FMP pre trip notification requirement applies to trips using scallop trawl and scallop dredge gear, a distinct set of fleets (IFS fleets) that apply only to the IFS program. Therefore, all IFS sea days in the IFS fleets are assigned to trips via the IVR system (Rows 36, 37, 40, and 42, Table 1, Column A and Table 2, Columns A and I).

The rest of the fleets (Rows 1-8, 13-35, and 44-62, Tables 1 and 2) may be composed of trips with FMP pretrip notification requirements (NMS FMP and IFM HERR). For these fleets, the following steps are taken to apportion the allocated observer sea days (Column A) among the PTNS (Table 2, Columns J and K for NMS FMP and IFM HERR, respectively) and the Sea Day Schedule (Table 2, Column L).

- Derive the fraction of VTR activity that requires pretrip notification within each fleet.
    - For each fleet, divide the number of VTR trips with the FMP-specific PTNS requirements (not shown in table) by the total VTR trips in the fleet (Column D, Table 1).

      For example, if there are 40 VTR trips and 10 of these trips are subject to NMS FMP pretrip notification requirements in a fleet, then the fraction of VTR activity subject to PTNS requirements is 0.25 (10/40 = 0.25).

    - The fraction of VTR activity subject to NMS FMP pretrip notification requirements is given in Column G (Table 2), and the fraction of VTR activity subject to the IFM HERR is given in Column H (Table 2).

- Derive the allocated observer sea days to be assigned by the selection system associated with each specific FMP with pretrip notification requirements.
    - Multiply the fraction of VTR activity subject to the FMP-specific PTNS requirements (Column G for NMS FMP; Column H for IFM HERR; Table 2) by the total number of allocated sea days within each fleet (Column A; Table 2), and round to whole days. The remaining sea days in the fleet are assigned to the Sea Day Schedule (Column L).

      *For example, if there are 32 allocated SBRM observer sea days and the fraction of VTR activity subject to NMS FMP pretrip notification is 0.25 in a fleet, then 8 (32 * 0.25) sea days, rounded to whole days, would be apportioned to the PTNS (these SBRM NEFOP sea days will contribute toward the total combined ASM target). The remaining 24 (32 - 8) sea days would be apportioned to the Sea Day Schedule.*

Table 2 presents the number of observer sea days allocated in each fleet or fleet group (Column A), the fraction of VTR activity subject to the NMS FMP pretrip notification requirement (Column G), the fraction of VTR activity subject to the IFM HERR pretrip notification requirement (Column H), and the number of SBRM NEFOP observer sea days for April 2021 through March 2022, by fleet and trip selection system (Columns I, J, K, and L). Throughout the

year, it may be necessary to make small adjustments to the sea days between the PTNS and the Sea Day Schedule to reflect current activity within a fleet. The IFS observer sea days assigned to the IVR system is given in Column I. The SBRM NEFOP observer sea days apportioned to the PTNS that will be assigned to fleets with NMS FMP pretrip notification requirements are given in Column J; the SBRM NEFOP sea days apportioned to the PTNS that will be assigned to fleets with IFM HERR pretrip notification requirements are given in Column K. The SBRM NEFOP observer sea days apportioned to the Sea Day Schedule is given in Column L[12]. A total of 1,856 sea days will be assigned to selected trips via the IVR system; 763 sea days will be assigned to selected trips via the PTNS (699 sea days in fleets with NMS FMP PTNS requirements and 64 sea days in fleets with IFM HERR pretrip notification requirements). A total of 2,485 days will be assigned to selected trips via the Sea Day Schedule (Table 2). As mentioned above, the PTNS sea days will be assigned to trips with pretrip notification requirements, a larger set than those trips with industry-funded monitoring requirements.

The numbers of sea days apportioned to the PTNS can be translated into percentages of observer coverage, referred to as "expected" observer coverage because future realized VTR effort is not known. Expected observer coverage (in terms of percentages) is calculated by using VTR effort in the previous year. However, as mentioned previously, the expected and realized observer coverage is not used to track SBRM NEFOP sea day accomplishments because percentage coverage may lead to over or under sampling of SBRM requirements. The actual amount of SBRM coverage each fleet will receive is unknown at the start of the sampling period. For each fleet that contains trips with NMS FMP pretrip notification requirements, the expected SBRM NEFOP coverage of trips with NMS pretrip notification requirements (Column M, Table 2) is derived by dividing the apportioned SBRM NEFOP PTNS sea days for NMS FMP (Column J, Table 2) by the product of the VTR activity from July 2018 through June 2019 (Column C, Table 1) and the fraction of VTR activity subject to pretrip notification requirements for NMS FMP (Column G, Table 2). All expected SBRM NEFOP PTNS values are conditional upon VTR activity. See the Appendix for step by step for 3 selected fleets.

These same steps are taken for the IFM HERR. The expected SBRM NEFOP coverage of trips with pretrip notification requirements for IFM HERR (Column N, Table 2) is derived by dividing the apportioned SBRM NEFOP PTNS sea days with pretrip notification requirements (Column K, Table 2), by the product of the VTR activity (Column C, Table 1) and the fraction of VTR activity subject to pretrip notification requirements for the IFM HERR (Column H, Table 2).

The calculations of expected coverage are made at the SBRM fleet level, not at the sector level. SBRM is not designed to specify the contribution of SBRM NEFOP sea days for FMP-specific industry-funded monitoring combined targets, which apply to only a subcomponent of SBRM fleets and a subcomponent of trips with FMP-specific pretrip notification requirements. The expected observer coverage of SBRM NEFOP PTNS by fleet represents a simplified approximation of the SBRM NEFOP sea days contribution toward the industry-funded monitoring total combined target for NMS FMP and IFM HERR. As mentioned above, for the NMS FMP and the IFM Herring FMP, trips with industry-funded monitoring requirements are a subset of those trips identified that have pretrip notification requirements. The expected coverage does not exclude common pool trips and sector trips with ASM exemptions and includes more herring trips than the herring trips by vessels holding permit "A" or "B" with the intent to land greater than or equal to

[12] If the sea days apportioned to SBRM NEFOP PTNS for NMS FMP (Column J) or SBRM NEFOP PTNS for HERR FMP (Column K) are fewer than the mean trip length for the fleet, then those sea days are reassigned to the Sea Day Schedule (Table 2, Column L). See Rows 4 and 49 for NMS FMP and Row 5 for HERR FMP for 3 occurrences.

50 mt of herring that require industry-funded monitoring. The expected observer coverage values by fleet are used to inform the initial SBRM coverage rate settings within PTNS at the start of a sampling program. Once a sampling program is underway, coverage rates are monitored and adjusted as needed in order to optimize sea day accomplishments.

MMPA Observer Sea Days

Of the 465 MMPA days, there are 30 sea days assigned to the PTNS and 145 sea days assigned to the Sea Day Schedule. There are 290 days for analysis that are not assigned. The 30 MMPA NEFOP Limited PTNS sea days will be assigned to declared groundfish trips[13] for the 2021 SBRM year; the 145 MMPA NEFOP Limited Sea Day Schedule sea days will be assigned for the 2021 SBRM year between April 2021 and March 2022. The fraction of industry activity subject to NMS FMP pretrip notification requirements during the SBRM year is used to apportion the MMPA NEFOP Limited PTNS sea days among the gillnet fleets (stratified by mesh size groups). The expected observer coverage for a fleet is derived by dividing the apportioned MMPA NEFOP Limited PTNS sea days in the fleet by the past industry activity in the previous SBRM year. Of the 145 MMPA NEFOP Limited Sea Day Schedule sea days, 88 days are apportioned among gillnet fleets stratified by state, geographical area, and distance from shore based on previous gillnet industry activity in the Mid-Atlantic region while 57 days are apportioned among gillnet fleets stratified by mesh size group in the New England region. Table 3 presents the MMPA observer sea days allocated to the gillnet fleets by selection system for April 2021 through March 2022. The expected observer coverage for gillnet fisheries that have NMS FMP pretrip notification requirements by fleet (Table 3) are used to inform the initial MMPA coverage rate settings within PTNS at the start of a sampling program. The actual amount of MMPA coverage each fleet will receive is unknown at the start of the sampling period. All expected MMPA NEFOP Limited PTNS values are conditional upon industry activity. Once a sampling program is underway, coverage rates are monitored and adjusted as needed in order to optimize sea day accomplishments. As mentioned previously, MMPA sea days do not contribute toward SBRM or industry-funded monitoring requirements because of differences in sampling protocols.

Summary of Sea Days by Trip Selection System for 2021

There are 5,569 observer sea days allocated for April 2021 through March 2022 to assess the amount and type of bycatch of fish, invertebrates, sea turtles, and marine mammals in the region by using NMFS funds associated with the SBRM and the MMPA observer sea days, and the industry funded scallop program for IFS sea days. There are 1,856 IFS sea days to be assigned by the IVR for IFS fleets. There are 3,248 SBRM NEFOP sea days, of which 2,485 sea days are apportioned to the Sea Day Schedule. There are 763 SBRM NEFOP sea days apportioned to the PTNS. Of the 763 sea days, 699 sea days are allocated to fleets with NMS FMP pretrip notification requirements, and 64 sea days are allocated to fleets with IFM HERR pretrip notification requirements. There are 465 MMPA sea days, of which 30 sea days are assigned to the PTNS, 145 sea days are assigned to the Sea Day Schedule, and 290 days will be in support of data analysis.

The expected contributions of SBRM NEFOP PTNS sea days toward the FMP-specific total combined targets of industry-funded monitoring are approximate and derived based on previous VTR activity. The expected observer coverage values by fleet are used to inform the

[13] PTNS deployed MMPA-funded sea days cover declared groundfish trips fishing in the New England region, regardless of port of departure.

initial coverage rate settings within PTNS at the start of the sampling programs. Once a sampling program is underway, coverage rates are monitored and adjusted as needed in order to optimize sea day accomplishments.

SELECTION SYSTEM OPERATIONAL NOTES

- In the 2020 SBRM dataset which was used for the 2021 SBRM analysis, there were 5 fleets (New England [NE] small mesh otter trawl [Row 5], Mid-Atlantic (MA) small mesh otter trawl [Row 7], MA large mesh OPEN general category [GEN] scallop trawl [Row 11], MA OPEN GEN scallop dredge fleet [Row 40], and NE lobster pot [Row 53]) that contained a few trips that met the groundfish trip criteria; however, these fleets are not considered groundfish fleets (i.e., gear types are not specified in NMS FMP). For these fleets, the fraction of VTR activity subject to the NMS FMP pretrip notification requirement is set to zero. The SBRM sea day requirement for these fleets will be met through coverage deployed through the Sea Day Schedule. There were 2 fleets (NE large mesh Ruhle trawl [Row 19] and NE conch pot [Row 51]) that contained 1 trip in each fleet that met the IFM herring trip criteria; however, these fleets are not considered herring fleets. For these fleets, the fraction of VTR activity subject to the IFM HERR pretrip notification requirement is set to zero.

- SBRM NEFOP sea days may be translated into expected observer coverage rate by dividing the number of observer sea days by the VTR activity. If the future VTR activity increases or decreases, this change would not alter the SBRM sampling requirements. However, it will change the expected observer coverage rate. Because future VTR activity is not known, the previous year's VTR activity is used as an estimate of future activity. The expected SBRM NEFOP PTNS observer coverage by fleet (Table 2) is used as a starting point (initial seed) for PTNS and will be adjusted throughout the year to achieve the SBRM required number of sea days. The realized observer coverage (the SBRM NEFOP observer sea days divided by realized activity) may differ from the expected observer coverage while still meeting the sampling requirements because the VTR activity changed.

- Throughout the year, it may be necessary to make small adjustments to the sea days between the PTNS and the Sea Day Schedule if VTR activity subject to pretrip notification requirement changes in relative magnitude from what was projected in this document. Large shifts in sea days between selection systems are not desirable. It is not possible to quantify a trigger for each potential scenario; however, the best operational guidance is to monitor the current industry activity on a monthly time interval and make small scale shifts if necessary to meet SBRM required sea days for a given fleet. Shifts in sea days between SBRM NEFOP PTNS and ASM PTNS will not occur.

- With the New England Fishery Management Council's Industry-Funded Monitoring Omnibus Amendment to 6 FMPs, there is potential for additional FMP industry-funded monitoring requirements in the future. Any future IFM targets should be independent of SBRM requirements (not a combination of realized IFM percentage and SBRM sea day sampling requirements) because the interaction effects among monitoring programs are highly complex, unpredictable, and challenging to operationally support.

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Table 1. The 2021 allocated observer sea days for April 2021 through March 2022, the Vessel Trip Report (VTR) activity (in days and trips) from July 2018 through June 2019 (taken from Wigley and Tholke 2020), and the expected observer coverage if VTR activity remains the same. The expected values are conditional upon industry activity. Purple shaded rows indicate industry funded scallop fleets. See Appendix Table 1 for fleet abbreviations.

	Fleet					A	B	C	D	E = A/C
2020 Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	**Sea Days Allocated for April 2021 - March 2022 (TOTAL)**	Trips for April 2021 - March 2022 (TOTAL)	2020 SBRM Vessel Trip Report (DAYS)	2020 SBRM Vessel Trip Report (TRIPS)	Expected % Coverage (DAYS)
1	Longline, Bottom	OPEN	all	MA	all	84	12	889	140	9.4%
2	Longline, Bottom	OPEN	all	NE	all	17	16	942	889	1.8%
3	Hand Line	OPEN	all	MA	all	14	12	3,231	3,060	0.4%
4	Hand Line	OPEN	all	NE	all	13	12	2,351	2,175	0.6%
5	Otter Trawl	OPEN	all	MA	sm	643	296	8,335	3,833	7.7%
6	Otter Trawl	OPEN	all	MA	lg	364	148	6,777	2,763	5.4%
7	Otter Trawl	OPEN	all	NE	sm	557	219	10,008	3,943	5.6%
8	Otter Trawl	OPEN	all	NE	lg	474	177	13,045	4,866	3.6%
9	Otter Trawl, Scallop	AA	GEN	MA	sm			18	9	
10	Otter Trawl, Scallop	AA	GEN	MA	lg			209	100	
11	Otter Trawl, Scallop	OPEN	GEN	MA	lg			28	17	
12	Otter Trawl, Scallop	OPEN	GEN	NE	lg			12	5	
13	Otter Trawl, Twin	OPEN	all	MA	sm	51	12	223	50	22.9%
14	Otter Trawl, Twin	OPEN	all	MA	lg	6	6	49	45	12.2%
15	Otter Trawl, Twin	OPEN	all	NE	sm	22	3	75	10	29.3%
16	Otter Trawl, Ruhle	OPEN	all	MA	sm	0	0	36	5	0.0%
17	Otter Trawl, Ruhle	OPEN	all	MA	lg	15	3	41	6	36.6%
18	Otter Trawl, Ruhle	OPEN	all	NE	sm	0	0	42	12	0.0%
19	Otter Trawl, Ruhle	OPEN	all	NE	lg	9	3	30	7	30.0%
20	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	102	12	473	57	21.6%
21	Otter Trawl, Shrimp	OPEN	all	MA	sm	0	0	2,328	446	0.0%
22	Otter Trawl, Shrimp	OPEN	all	NE	sm	0	0	44	26	0.0%
23	Otter Trawl, Other	OPEN	all	MA	sm	0	0	38	7	0.0%
24	Otter Trawl, Other	OPEN	all	NE	sm	0	0	360	81	0.0%
25	Otter Trawl, Other	OPEN	all	NE	lg	0	0	123	20	0.0%
26	Floating Trap	OPEN	all	MA	all	0	0	14	14	0.0%
27	Floating Trap	OPEN	all	NE	all	0	0	113	80	0.0%
28	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	sm	13	12	2,002	1,918	0.6%
29	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	lg	149	141	1,731	1,634	8.6%
30	Gillnet, Sink, Anchor, Drift	OPEN	all	MA	xlg	160	139	1,439	1,251	11.1%
31	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	sm	3	3	31	31	9.7%
32	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	lg	19	15	2,558	1,980	0.7%
33	Gillnet, Sink, Anchor, Drift	OPEN	all	NE	xlg	209	148	4,529	3,203	4.6%
34	Purse Seine	OPEN	all	MA	all	0	0	305	305	0.0%
35	Purse Seine	OPEN	all	NE	all	14	9	813	487	1.7%

Table 1, continued. The 2021 allocated observer sea days for April 2021 through March 2022, the Vessel Trip Report (VTR) activity (in days and trips) from July 2018 through June 2019 (taken from Wigley and Tholke 2020), and the expected observer coverage if VTR activity remains the same. The expected values are conditional upon industry activity. Purple shaded rows indicate industry funded scallop fleets. See Appendix Table 1 for fleet abbreviations.

	Fleet					A	B	C	D	E = A/C	F = B/D
2020 Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	**Sea Days Allocated for April 2021 - March 2022 (TOTAL)**	Trips for April 2021 - March 2022 (TOTAL)	2020 SBRM Vessel Trip Report (DAYS)	2020 SBRM Vessel Trip Report (TRIPS)	Expected % Coverage (DAYS)	Expected % Coverage (TRIPS)
36	Dredge, Scallop	AA	GEN	MA	all	257	69	2,182	1,320	3.6%	3.2%
37	Dredge, Scallop	AA	GEN	NE	all	938	143	2,537	1,281	5.0%	4.1%
38	Dredge, Scallop	AA	LIM	MA	all			4,646	694		
39	Dredge, Scallop	AA	LIM	NE	all			16,150	2,212		
40	Dredge, Scallop	OPEN	GEN	MA	all	54	33	1,908	1,152	0.9%	0.8%
41	Dredge, Scallop	OPEN	GEN	NE	all			4,097	3,101		
42	Dredge, Scallop	OPEN	LIM	MA	all	607	69	2,085	272	7.5%	7.4%
43	Dredge, Scallop	OPEN	LIM	NE	all			6,019	664		
44	Danish Seine	OPEN	all	MA	all	0	0	26	26	0.0%	0.0%
45	Trawl, Midwater	all	all	NE	sm	31	9	505	153	6.1%	5.9%
46	Trawl, Midwater	OPEN	all	MA	sm	13	3	76	18	17.1%	16.7%
47	Pots and Traps, Other	OPEN	all	NE	all	0	0	365	357	0.0%	0.0%
48	Pots and Traps, Fish	OPEN	all	MA	all	13	12	735	711	1.8%	1.7%
49	Pots and Traps, Fish	OPEN	all	NE	all	15	12	928	906	1.6%	1.3%
50	Pots and Traps, Conch	OPEN	all	MA	all	13	12	1,069	1,051	1.2%	1.1%
51	Pots and Traps, Conch	OPEN	all	NE	all	12	12	1,180	1,175	1.0%	1.0%
52	Pots and Traps, Lobster	OPEN	all	MA	all	20	12	1,661	1,078	1.2%	1.1%
53	Pots and Traps, Lobster	OPEN	all	NE	all	17	13	34,614	26,526	0.0%	0.0%
54	Pots and Traps, Crab	OPEN	all	MA	all	22	6	51	14	43.1%	42.9%
55	Pots and Traps, Crab	OPEN	all	NE	all	79	12	666	107	11.9%	11.2%
56	Beam Trawl	OPEN	all	MA	sm	0	0	49	16	0.0%	0.0%
57	Beam Trawl	OPEN	all	NE	lg	0	0	30	14	0.0%	0.0%
58	Dredge, Other	OPEN	all	MA	all	0	0	310	274	0.0%	0.0%
59	Dredge, Other	OPEN	all	NE	all	0	0	7	7	0.0%	0.0%
60	Dredge, Urchin	OPEN	all	NE	all	0	0	10	10	0.0%	0.0%
61	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	33	17	3,668	1,948	0.9%	0.9%
62	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	42	29	2,573	1,760	1.6%	1.6%
	MMPA coverage					175	See Table 3 for Marine Mammal Protection Act (MMPA) sea days				
	MMPA analysis					290					
	TOTAL					5,569					

Table 2. The 2021 allocated observer sea days for April 2021 through March 2022, the fraction of industry activity from July 2018 through June 2019 that had Northeast Multispecies (NMS) fishery management plan (FMP) pretrip notification requirements (taken from NEFSC 2020), and the fraction of activity that would have Atlantic herring FMP pretrip notification herring (HERR) requirements (taken from NEFSC 2020), the allocated observer sea days by fleet and trip selection system, and the expected observer coverage if industry activity remains the same. The expected values are conditional upon industry activity. IFS = Industry Funded Scallop; PTNS = Pre-Trip Notification System; NEFOP = Northeast Fisheries Observer Program; SBRM = Standardized Bycatch Reporting Methodology; IVR = Interactive Voice Response. Column A is taken from Table 1. Purple shaded identifies industry funded scallop; green shading identifies PTNS for NMS FMP; pink shading identifies PTNS for HERR FMP. See Appendix Table 1 for fleet abbreviations.

							A	G	H	I	J = A*G	K= A*H	L = A-(J+K)	M = J/(C*G)	N = K/(C*H)
	Fleet									Allocated observer sea days for April 2021 to March 2022by TRIP SELECTION SYSTEM				Expected coverage (%) bySBRM NEFOP PTNS	
2020 Row	Gear Type		Access Area	Trip Cat.	Region	Mesh	**Sea Days Allocated for April 2021 - March 2022 (TOTAL)**	2020 Fraction of activity subject to NMS FMP PTNS Reqmts	2020 Fraction of activity subject to HERR FMP PTNS Reqmts	2021 IFS Sea Days **IVR**	2021 SBRM Sea Days **NEFOP PTNS for NMS FMP**	2021 SBRM Sea Days **NEFOP PTNS for HERR FMP**	2021 SBRM Sea Days **NEFOP Sea Day Schedule**	2021 SBRM Sea Day % **NEFOP PTNS for NMS FMP**	2021 SBRM Sea Day % **NEFOP PTNS for HERR FMP**
1	Longline, Bottom		OPEN	all	MA	all	84	0.000	0.000	0	0	0	84	0.0%	0.0%
2	Longline, Bottom		OPEN	all	NE	all	17	0.180	0.000	0	3	0	14	1.8%	0.0%
3	Hand Line		OPEN	all	MA	all	14	0.000	0.000	0	0	0	14	0.0%	0.0%
4	Hand Line		OPEN	all	NE	all	13	0.098	0.000	0	0	0	13	0.0%	0.0%
5	Otter Trawl		OPEN	all	MA	sm	643	0.000	0.001	0	0	0	643	0.0%	0.0%
6	Otter Trawl		OPEN	all	MA	lg	364	0.099	0.000	0	36	0	328	5.4%	0.0%
7	Otter Trawl		OPEN	all	NE	sm	557	0.000	0.032	0	0	18	539	0.0%	5.6%
8	Otter Trawl		OPEN	all	NE	lg	474	0.742	0.000	0	352	0	122	3.6%	0.0%
9	Otter Trawl, Scallop		AA	GEN	MA	sm	0	0.000	0.000	0					
10	Otter Trawl, Scallop		AA	GEN	MA	lg	0	0.000	0.000	0					
11	Otter Trawl, Scallop		OPEN	GEN	MA	lg	0	0.000	0.000	0					
12	Otter Trawl, Scallop		OPEN	GEN	NE	lg	0	0.000	0.000	0					
13	Otter Trawl, Twin		OPEN	all	MA	sm	51	0.000	0.000	0	0	0	51	0.0%	0.0%
14	Otter Trawl, Twin		OPEN	all	MA	lg	6	0.956	0.000	0	6	0	0	12.8%	0.0%
15	Otter Trawl, Twin		OPEN	all	NE	sm	22	0.000	0.000	0	0	0	22	0.0%	0.0%
16	Otter Trawl, Ruhle		OPEN	all	MA	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
17	Otter Trawl, Ruhle		OPEN	all	MA	lg	15	1.000	0.000	0	15	0	0	36.6%	0.0%
18	Otter Trawl, Ruhle		OPEN	all	NE	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
19	Otter Trawl, Ruhle		OPEN	all	NE	lg	9	0.714	0.000	0	9	0	0	42.0%	0.0%
20	Otter Trawl, Haddock Separator		OPEN	all	NE	lg	102	1.000	0.000	0	102	0	0	21.6%	0.0%
21	Otter Trawl, Shrimp		OPEN	all	MA	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
22	Otter Trawl, Shrimp		OPEN	all	NE	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
23	Otter Trawl, Other		OPEN	all	MA	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
24	Otter Trawl, Other		OPEN	all	NE	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
25	Otter Trawl, Other		OPEN	all	NE	lg	0	0.000	0.000	0	0	0	0	0.0%	0.0%
26	Floating Trap		OPEN	all	MA	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
27	Floating Trap		OPEN	all	NE	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
28	Gillnet, Sink, Anchor, Drift		OPEN	all	MA	sm	13	0.000	0.000	0	0	0	13	0.0%	0.0%
29	Gillnet, Sink, Anchor, Drift		OPEN	all	MA	lg	149	0.000	0.000	0	0	0	149	0.0%	0.0%
30	Gillnet, Sink, Anchor, Drift		OPEN	all	MA	xlg	160	0.098	0.000	0	16	0	144	11.3%	0.0%
31	Gillnet, Sink, Anchor, Drift		OPEN	all	NE	sm	3	0.000	0.000	0	0	0	3	0.0%	0.0%
32	Gillnet, Sink, Anchor, Drift		OPEN	all	NE	lg	19	0.742	0.000	0	14	0	5	0.7%	0.0%
33	Gillnet, Sink, Anchor, Drift		OPEN	all	NE	xlg	209	0.701	0.000	0	146	0	63	4.6%	0.0%
34	Purse Seine		OPEN	all	MA	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
35	Purse Seine		OPEN	all	NE	all	14	0.000	0.534	0	0	7	7	0.0%	1.6%

Table 2, continued. The 2021 allocated observer sea days for April 2021 through March 2022, the fraction of industry activity from July 2018 through June 2019 that had Northeast Multispecies (NMS) fishery management plan (FMP) pre trip notification requirements (taken from NEFSC 2020) and the fraction of activity that would have Atlantic herring FMP pretrip notification herring (HERR) requirements (taken from NEFSC 2020), the allocated observer sea days by fleet and trip selection system, and the expected observer coverage if industry activity remains the same. The expected values are conditional upon industry activity. IFS = Industry Funded scallop; PTNS = Pre-Trip Notification System; NEFOP = Northeast Fisheries Observer Program; SBRM = Standardized Bycatch Reporting Methodology; IVR = Interactive Voice Response. Column A is taken from Table 1. Purple shading identifies industry funded scallop; green shading identifies PTNS for NMS FMP; pink shading identifies PTNS for HERR FMP. See Appendix Table 1 for fleet abbreviations.

						A	G	H	I	J = A*G	K = A*H	L = A-(J+K)	M = J/(C*G)	N = K/(C*H)
	Fleet								Allocated observer sea days for April 2021 to March 2022by TRIP SELECTION SYSTEM				Expected coverage (%) bySBRM NEFOP PTNS	
2020 Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	**Sea Days Allocated for April 2021 - March 2022 (TOTAL)**	2020 Fraction of activity subject to NMS FMP PTNS Reqmts	2020 Fraction of activity subject to HERR FMP PTNS Reqmts	2021 IFS Sea Days **IVR**	2021 SBRM Sea Days **NEFOP PTNS for NMS FMP**	2021 SBRM Sea Days **NEFOP PTNS for HERR FMP**	2021 SBRM Sea Days **NEFOP Sea Day Schedule**	2021 SBRM Sea Day % **NEFOP PTNS for NMS FMP**	2021 SBRM Sea Day % **NEFOP PTNS for HERR FMP**
36	Dredge, Scallop	AA	GEN	MA	all	257	0.000	0.000	257					
37	Dredge, Scallop	AA	GEN	NE	all	938	0.000	0.000	938					
38	Dredge, Scallop	AA	LIM	MA	all		0.000	0.000						
39	Dredge, Scallop	AA	LIM	NE	all		0.000	0.000						
40	Dredge, Scallop	OPEN	GEN	MA	all	54	0.000	0.000	54					
41	Dredge, Scallop	OPEN	GEN	NE	all		0.000	0.000						
42	Dredge, Scallop	OPEN	LIM	MA	all	607	0.000	0.000	607					
43	Dredge, Scallop	OPEN	LIM	NE	all		0.000	0.000						
44	Danish Seine	OPEN	all	MA	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
45	Trawl, Midwater	all	all	NE	sm	31	0.000	0.837	0	0	26	5	0.0%	6.2%
46	Trawl, Midwater	OPEN	all	MA	sm	13	0.000	0.889	0	0	13	0	0.0%	19.2%
47	Pots and Traps, Other	OPEN	all	NE	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
48	Pots and Traps, Fish	OPEN	all	MA	all	13	0.000	0.000	0	0	0	13	0.0%	0.0%
49	Pots and Traps, Fish	OPEN	all	NE	all	15	0.001	0.000	0	0	0	15	0.0%	0.0%
50	Pots and Traps, Conch	OPEN	all	MA	all	13	0.000	0.000	0	0	0	13	0.0%	0.0%
51	Pots and Traps, Conch	OPEN	all	NE	all	12	0.000	0.000	0	0	0	12	0.0%	0.0%
52	Pots and Traps, Lobster	OPEN	all	MA	all	20	0.000	0.000	0	0	0	20	0.0%	0.0%
53	Pots and Traps, Lobster	OPEN	all	NE	all	17	0.000	0.000	0	0	0	17	0.0%	0.0%
54	Pots and Traps, Crab	OPEN	all	MA	all	22	0.000	0.000	0	0	0	22	0.0%	0.0%
55	Pots and Traps, Crab	OPEN	all	NE	all	79	0.000	0.000	0	0	0	79	0.0%	0.0%
56	Beam Trawl	OPEN	all	MA	sm	0	0.000	0.000	0	0	0	0	0.0%	0.0%
57	Beam Trawl	OPEN	all	NE	lg	0	0.000	0.000	0	0	0	0	0.0%	0.0%
58	Dredge, Other	OPEN	all	MA	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
59	Dredge, Other	OPEN	all	NE	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
60	Dredge, Urchin	OPEN	all	NE	all	0	0.000	0.000	0	0	0	0	0.0%	0.0%
61	Dredge, Ocean Quahog/Surfclam	OPEN	all	MA	all	33	0.000	0.000	0	0	0	33	0.0%	0.0%
62	Dredge, Ocean Quahog/Surfclam	OPEN	all	NE	all	42	0.000	0.000	0	0	0	42	0.0%	0.0%
	MMPA coverage					175	See Table 3 for Marine Mammal Protection Act (MMPA) sea days							
	MMPA analysis					290								
	TOTAL					5,569			1,856	699	64	2,485		

Table 3. The Marine Mammal Protection Act allocated observer sea days from 2021 for gillnet fleets by selection system. Sea days apportioned to the Pre Trip Notification System (PTNS) will be assigned for April 2021 through May 2021 and September 2021 through March 2022; sea days apportioned to the Sea Day Schedule will be assigned for April 2021 through March 2022. The expected observer coverage, if industry activity remains the same, is given for PTNS allocated sea days. The expected values are conditional upon industry activity. See Appendix Table 2 for mesh size abbreviations.

Selection Source	Gear	Mesh Size	State	Geographical Area	Trip Characteristics	Sea days	Expected coverage
PTNS	Gillnet	LG				4	4%
PTNS	Gillnet	XLG				26	4%
Sea Day Schedule	Gillnet	LG				21	
Sea Day Schedule	Gillnet	XLG				36	
Sea Day Schedule	Gillnet	Any	VA	Accomack County	Bay	2	
Sea Day Schedule	Gillnet	Any	VA	Accomack County	Ocean 3-200nm	7	
Sea Day Schedule	Gillnet	Any	VA	City of Hampton	Bay	5	
Sea Day Schedule	Gillnet	Any	VA	City of Hampton	Ocean 3-200nm	1	
Sea Day Schedule	Gillnet	Any	VA	Mathews County	Bay	2	
Sea Day Schedule	Gillnet	Any	VA	Northampton County	Bay	2	
Sea Day Schedule	Gillnet	Any	VA	Northampton County	Ocean 3-200nm	1	
Sea Day Schedule	Gillnet	Any	VA	City of Poquoson	Bay	1	
Sea Day Schedule	Gillnet	Any	VA	City of Poquoson	Ocean 0-3nm	2	
Sea Day Schedule	Gillnet	Any	VA	City of Virginia Beach	Bay	3	
Sea Day Schedule	Gillnet	Any	VA	City of Virginia Beach	Ocean 3-200nm	1	
Sea Day Schedule	Gillnet	Any	VA	York County	Ocean 3-200nm	1	
Sea Day Schedule	Gillnet	LG	NC	Dare County	Ocean 3-200nm	0	
Sea Day Schedule	Gillnet	LG	NC	Dare County	Ocean 0-3nm	3	
Sea Day Schedule	Gillnet	LG	NC	Hyde County	Ocean 0-3nm	0	
Sea Day Schedule	Gillnet	SM	NC	Currituck County	Ocean 0-3nm	0	
Sea Day Schedule	Gillnet	SM	NC	Dare County	Ocean 3-200nm	3	
Sea Day Schedule	Gillnet	SM	NC	Dare County	Ocean 0-3nm	6	
Sea Day Schedule	Gillnet	SM	NC	Hyde County	Ocean 3-200nm	0	
Sea Day Schedule	Gillnet	SM	NC	Hyde County	Ocean 0-3nm	2	
Sea Day Schedule	Gillnet	LM	NC	Carteret County	Ocean 0-3nm	3	
Sea Day Schedule	Gillnet	LM	NC	New Hanover County	Ocean 0-3nm	3	
Sea Day Schedule	Gillnet	SM	NC	Brunswick County	Ocean 0-3nm	4	
Sea Day Schedule	Gillnet	SM	NC	Carteret County	Ocean 0-3nm	14	
Sea Day Schedule	Gillnet	SM	NC	New Hanover County	Ocean 0-3nm	6	
Sea Day Schedule	Gillnet	SM	NC	Onslow County	Ocean 0-3nm	9	
Sea Day Schedule	Gillnet	SM	NC	Pender County	Ocean 0-3nm	7	
					Total	**175**	

<table>
<tr><td>Funding Category</td><td colspan="5">NMFS</td><td colspan="3">INDUSTRY</td></tr>
<tr><td>Sampling Design</td><td colspan="3">SBRM</td><td colspan="2">MMPA</td><td>ASM</td><td>IFM HERR</td><td>IFS</td></tr>
<tr><td>Observer Program/ Protocols</td><td colspan="3">NEFOP</td><td colspan="2">NEFOP Limited</td><td>ASM</td><td>IFM HERR</td><td>IFS</td></tr>
<tr><td rowspan="2">Selection System</td><td rowspan="2">Sea Day Schedule
2,485 sea days</td><td colspan="2">PTNS</td><td rowspan="2">Sea Day Schedule
145 sea days</td><td rowspan="2">PTNS
30 sea days</td><td rowspan="2">PTNS</td><td rowspan="2">PTNS</td><td rowspan="2">IVR
1,856 sea days</td></tr>
<tr><td>NMS FMP
699 sea days</td><td>HERR64 sea days</td></tr>
</table>

Figure 1. Schematic of funding categories, sampling designs, observer programs, and trip selection systems used by the Northeast Fisheries Science Center's Fisheries Monitoring and Operations Branch for the 2021 observer sea days allocated for April 2021 through March 2022. ASM = At-Sea Monitoring; FMP = fishery management plan; IFM HERR = Industry Funded Monitoring for Atlantic herring FMP; IFS = Industry Funded Scallop; IVR = Interactive Voice Response; MMPA = Marine Mammal Protection Act; NMFS = National Marine Fisheries Service; NEFOP = Northeast Fisheries Observer Program; PTNS = Pre trip Notification System; SBRM = Standardized Bycatch Reporting Methodology; NMS = Northeast Multispecies. *Note: not all allocated SBRM NEFOP PTNS sea days will contribute toward the industry-funded monitoring total combined target requirements. Funding equivalent to 290 MMPA sea days will be in support of observer data analysis (NEFSC and GARFO 2021).*

Appendix Table 1. Stratification abbreviations used for Standardized Bycatch Reporting Methodology fleets in Tables 1 and 2.

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

Appendix Table 2. Stratification abbreviations used for Marine Mammal Protection Act fleets in Table 3.

Abbreviation	Definition
Sm	Small mesh (less than 5.00 in.)
Lg	Large mesh (from 5.00 to 7.99 in.)
Xlg	Extra large mesh (8.00 in.)

APPENDIX

Step by step calculations for 3 selected fleets in Tables 1 and 2

1. New England (NE) large mesh otter trawl fleet (Row 8) for April 2021 through March 2022

How many observer sea days in this fleet (Row 8) are apportioned to each selection system?

474 days — Total number of Standardized Bycatch Reporting Methodology (SBRM) Northeast Fisheries Observer Program (NEFOP) observer sea days for this fleet (Table 1, Column A, Row 8) is taken from the 2021 SBRM Annual Discard Report with Observer Sea Day Allocation (NEFSC and GARFO 2021) and is a variance-based estimate of sample size.

13,045 days — Number of Vessel Trip Report (VTR) days in this fleet (Table 1, Column C, Row 8) is taken from 2020 Discard estimation, precision, and sample size analyses for 14 federally managed species in the water off the northeastern United States (Wigley and Tholke 2020).

0.742 — Fraction of industry activity with Northeast Multispecies (NMS) fishery management plan (FMP) pretrip notification requirements in this fleet (Table 2, Column G, Row 8) is derived by dividing the number of trips subject to NMS FMP pretrip notification requirements in this fleet (not shown in this table) by the number of trips in this fleet (Table 1, Column D, Row 8).

0.000 — Fraction of industry activity with Industry Funded Monitoring (IFM) Atlantic herring (HERR) pretrip notification requirements in this fleet (Table 2, Column H, Row 8) is derived by dividing the number of trips subject to the IFM HERR pretrip notification requirements in this fleet (not shown in this table) by the number of trips in this fleet (Table 1, Column D, Row 8).

0 days — Number of Industry Funded Scallop (IFS) observer sea days for the Interactive Voice Response (IVR) system (IFS sea day for IVR, Table 2, Column I, Row 8) is taken from Table 1, Column A, Row 8. This fleet is not an IFS fleet; trips in this fleet did not use a scallop trawl or scallop dredge.

352 days — (474 * 0.742) Number of SBRM NEFOP observer sea days in this fleet apportioned to the Pre-Trip Notification System (PTNS) for trips with NMS FMP pretrip notification requirements, rounded to whole days (SBRM NEFOP PTNS for NMS FMP; Table 2, Column J, Row 8) is derived by the product of the total SBRM NEFOP observer sea days in this fleet (Table 2, Column A, Row 8) and the fraction of industry activity with NMS FMP's pretrip notification requirements in this fleet (Table 2, Column G, Row 8).

0 days — (474 * 0.000) Number of SBRM NEFOP observer sea days in this fleet apportioned to the PTNS for trips with IFM HERR pretrip notification requirements, rounded to whole days (SBRM NEFOP PTNS for IFM HERR; Table 2, Column K, Row 8) is derived by the product of the total SBRM NEFOP observer sea days in this fleet (Table 2, Column A, Row 8) and fraction of industry activity with IFM herring pretrip notification requirements in this fleet (Table 2, Column H, Row 8).

122 days — (474 – (352 + 0)) Number of SBRM NEFOP observer sea days apportioned to the NEFOP Sea Day Schedule selection protocol system for this fleet (SBRM NEFOP for NEFOP Sea Day Schedule; Table 2, Column L, Row 8) is derived by the sum of SBRM NEFOP PTNS for NMS FMP (Table 2, Column J, Row 8) and SBRM NEFOP PTNS for IFM HERR

(Table 2, Column K, Row 8) subtracted from the of total SBRM NEFOP observer sea days for this fleet (Table 2, Column A, Row 8).

What is the expected observer coverage percentage provided by SBRM NEFOP PTNS sea days in this fleet?

Future industry activity (for the fleet, the fleet's subcomponents, and total industry activity) is not known, so past activity is used (July 2018 through June 2019, taken from the SBRM analysis). The expected percentage of SBRM NEFOP observer sea days is a conditional value based on the assumption that future effort will be the same as past effort.

This expected observer coverage represents an approximate percentage of SBRM NEFOP sea days that will contribute toward the NMS FMP and IFM HERR total combined monitoring requirements. This estimate does not account for the portion of declared trips with Exempted Fishing Permits (EFP) and/or FMP monitoring exemptions.

3.6% (352 / (13,045 * 0.742)*100) The expected percentage of SBRM NEFOP PTNS observer sea days for trips with NMS FMP pretrip notification requirement in this fleet (Table 2, Column M, Row 8) is derived by dividing the SBRM NEFOP PTNS for NMS FMP observer sea days (Table 2, Column J, Row 8) by the product of the VTR effort (Table 1, Column C, Row 8) and the fraction of industry activity with NMS FMP pretrip notification requirements (Table 2, Column G, Row 8). To represent as a percentage, multiply by 100.

0% (0 / (13,045 * 0.000)*100) The expected percentage of SBRM NEFOP PTNS observer sea days for trips with IFM HERR FMP pre-trip notification requirement in this fleet in calendar quarter 1 (Table 2, Column N, Row 8) is derived by dividing the SBRM NEFOP PTNS for IFM HERR FMP observer sea days (Table 2, Column K, Row 8) by the product of the VTR effort (Table 1, Column C, Row 8) and the fraction of industry activity with IFM HERR FMP pretrip notification requirements (Table 2, Column H, Row 8). To represent as a percentage, multiply by 100.

2. NE small mesh Otter trawl fleet (Row 7) for April 2021 through March 2022

How many observer sea days in this fleet (Row 7) are apportioned to each selection system?

557days Total number of SBRM NEFOP observer sea days for this fleet (Table 1, Column A, Row 7) is taken from the 2021 SBRM Annual Discard Report with Observer Sea Day Allocation (NEFSC and GARFO 2021) and is a variance-based estimate of sample size.

10,008 days Number of VTR days in this fleet (Table 1, Column C, Row 7) is taken from 2020 Discard estimation, precision, and sample size analyses for 14 federally managed species in the water off the northeastern United States (Wigley and Tholke 2020).

0.000 Fraction of industry activity with Northeast Multispecies (NMS) fishery management plan (FMP) pretrip notification requirements in this fleet (Table 2, Column G, Row 7) is derived by dividing the number of trips subject to NMS FMP pretrip notification requirements in this fleet (not shown in this table) by the number of trips in this fleet (Table 1, Column D, Row 7).

0.032 Fraction of industry activity with Industry Funded Monitoring (IFM) Atlantic herring (HERR) pretrip notification requirements in this fleet (Table 2, Column H, Row 7) is derived by dividing the number of trips subject to the IFM HERR pre trip notification requirements in this fleet (not shown in this table) by the number of trips in this fleet (Table 1, Column D, Row 7).

0 days — Number of Industry Funded Scallop (IFS) observer sea days for the Interactive Voice Response (IVR) system (IFS sea day for IVR, Table 2, Column I, Row 7) is taken from Table 1, Column A, Row 7). This fleet is not an IFS fleet; trips in this fleet did not use a scallop trawl or scallop dredge.

0 days — (557 * 0.000) Number of SBRM NEFOP observer sea days in this fleet apportioned to the PTNS for trips with NMS FMP pretrip notification requirements, rounded to whole days (SBRM NEFOP PTNS for NMS FMP; Table 2, Column J, Row 7) is derived by the product of the total SBRM NEFOP observer sea days in this fleet (Table 2, Column A, Row 7) and the fraction of industry activity with NMS FMP pre trip notification requirements in this fleet in calendar quarter 1 (Table 2, Column G, Row 7).

18 days — (557 * 0.032) Number of SBRM NEFOP observer sea days in this fleet apportioned to the PTNS for trips with IFM HERR pretrip notification requirements, rounded to whole days (SBRM NEFOP PTNS for IFM HERR; Table 2, Column K, Row 7) is derived by the product of the total SBRM NEFOP observer sea days in this fleet (Table 2, Column A, Row 7) and the fraction of industry activity with IFM herring pretrip notification requirements in this fleet (Table 2, Column H, Row 7).

539 days — (557 – (0 + 18)) Number of SBRM NEFOP observer sea days apportioned to the NEFOP Sea Day Schedule selection protocol system for this fleet (SBRM NEFOP for NEFOP Sea Day Schedule; Table 2, Column L, Row 7) is derived by the sum of SBRM NEFOP PTNS for NMS FMP (Table 2, Column J, Row 7) and SBRM NEFOP PTNS for IFM HERR (Table 2, Column K, Row 7) subtracted from the of total SBRM NEFOP observer sea days for this fleet (Table 2, Column A, Row 7).

What is the expected observer coverage percentage provided by SBRM NEFOP PTNS sea days in this fleet?

Future industry activity (for the fleet, the fleet's subcomponents, and total industry activity) is not known, so past activity is used (July 2018 through June 2019, taken from the SBRM analysis). The expected percentage of SBRM NEFOP observer sea days is a conditional value based on the assumption that future effort will be the same as past effort.

This expected observer coverage represents an approximate percentage of SBRM NEFOP sea days that will contribute toward the NMS FMP and IFM HERR total combined monitoring requirements. This estimate does not account for the portion of declared trips with EFPs and/or FMP monitoring exemptions.

0% — (0 / (10,008 * 0.000)*100) The expected percentage of SBRM NEFOP PTNS observer sea days for trips with NMS FMP pretrip notification requirement in this fleet (Table 2, Column M, Row 7) is derived by dividing the SBRM NEFOP PTNS for NMS FMP observer sea days (Table 2, Column J, Row 7) by the product of the VTR effort (Table 1, Column C, Row 7) and the fraction of industry activity with NMS FMP pretrip notification requirements (Table 2, Column G, Row 7). To represent as a percentage, multiply by 100.

5.6% — (18 / (10,008 * 0.032)*100) The expected percentage of SBRM NEFOP PTNS observer sea days for trips with IFM HERR FMP pretrip notification requirement in this fleet (Table 2, Column N, Row 7) is derived by dividing the SBRM NEFOP PTNS for IFM HERR FMP observer sea days (Table 2, Column K, Row 7) by the product of the VTR effort (Table 1, Column C, Row 7) and the fraction of industry activity with IFM HERR FMP pretrip notification requirements (Table 2, Column H, Row 7). To represent as a percentage, multiply by 100.

3. NE small mesh midwater trawl fleet (Row 45) for April 2021 through March 2022

How many observer sea days in this fleet (Row 45) are apportioned to each selection system?

31 days — Total number of SBRM NEFOP observer sea days for this fleet (Table 1, Column A, Row 45) is taken from the 2021 SBRM Annual Discard Report with Observer Sea Day Allocation (NEFSC and GARFO 2021) and is based on minimum pilot coverage (variance-based estimate of sample size were removed by importance filter).

505 days — Number of VTR days in this fleet (Table 1, Column C, Row 45) is taken from 2020 Discard estimation, precision, and sample size analyses for 14 federally managed species in the water off the northeastern United States (Wigley and Tholke 2020).

0.000 — Fraction of industry activity with Northeast Multispecies (NMS) fishery management plan (FMP) pretrip notification requirements in this fleet (Table 2, Column G, Row 45) is derived by dividing the number of trips subject to NMS FMP pretrip notification requirements in this fleet (not shown in this table) by the number of trips in this fleet (Table 1, Column D, Row 45).

0.837 — Fraction of industry activity with Industry Funded Monitoring (IFM) Atlantic herring (HERR) pretrip notification requirements in this fleet (Table 2, Column H, Row 45) is derived by dividing the number of trips subject to the IFM HERR pretrip notification requirements in this fleet (not shown in this table) by the number of trips in this fleet (Table 1, Column D, Row 45).

0 days — Number of Industry Funded Scallop (IFS) observer sea days for the Interactive Voice Response system (IFS sea day for IVR, Table 2, Column I, Row 45) is taken from Table 1, Column A, Row 45. This fleet is not an IFS fleet; trips in this fleet did not use a scallop trawl or scallop dredge.

0 days — (31 * 0.000) Number of SBRM NEFOP observer sea days in this fleet apportioned to the PTNS for trips with NMS FMP pretrip notification requirements, rounded to whole days (SBRM NEFOP PTNS for NMS FMP; Table 2, Column J, Row 45) is derived by the product of the total SBRM NEFOP observer sea days in this fleet (Table 2, Column A, Row 45) and the fraction of industry activity with NMS FMP pretrip notification requirements in this fleet in calendar quarter 1 (Table 2, Column G, Row 45).

26 days — (31 * 0.837) Number of SBRM NEFOP observer sea days in this fleet apportioned to the PTNS for trips with IFM HERR pretrip notification requirement, rounded to whole days (SBRM NEFOP PTNS for IFM HERR; Table 2, Column K, Row 45) is derived by the product of the total SBRM NEFOP observer sea days in this fleet (Table 2, Column A, Row 45) and the fraction of industry activity with IFM herring pretrip notification requirements in this fleet (Table 2, Column H, Row 45).

5 days — (31 – (0 + 26)) Number of SBRM NEFOP observer sea days apportioned to the NEFOP Sea Day Schedule selection protocol system for this fleet (SBRM NEFOP for NEFOP Sea Day Schedule; Table 2, Column L, Row 45) is derived by the sum of SBRM NEFOP PTNS for NMS FMP (Table 2, Column J, Row 45) and SBRM NEFOP PTNS for IFM HERR (Table 2, Column K, Row 45) subtracted from the of total SBRM NEFOP observer sea days for this fleet (Table 2, Column A, Row 45).

What is the expected observer coverage percentage provided by SBRM NEFOP PTNS sea days in this fleet?

Future industry activity (for the fleet, the fleet's subcomponents, and total industry activity) is not known, so past activity is used (July 2019 through June 2020, taken from the SBRM analysis). The expected percentage of SBRM NEFOP observer sea days is a conditional value based on the assumption that future effort will be the same as past effort.

This expected observer coverage represents an approximate percentage of SBRM NEFOP sea days that will contribute toward the NMS FMP and IFM HERR total combined monitoring requirements. This estimate does not account for the portion of declared trips with Exempted Fishing Permits and/or FMP monitoring exemptions.

0% (0 / (505 * 0.000)*100) The expected percentage of SBRM NEFOP PTNS observer sea days for trips with NMS FMP pretrip notification requirement in this fleet (Table 2, Column M, Row 7) is derived by dividing the SBRM NEFOP PTNS for NMS FMP observer sea days (Table 2, Column J, Row 45) by the product of the VTR effort (Table 1, Column C, Row 7) and the fraction of industry activity with NMS FMP pretrip notification requirements (Table 2, Column G, Row 45). To represent as a percentage, multiply by 100.

6.2% (26 / (505 * 0.837)*100) The expected percentage of SBRM NEFOP PTNS observer sea days for trips with IFM HERR FMP pretrip notification requirement in this fleet (Table 2, Column N, Row 45) is derived by dividing the SBRM NEFOP PTNS for IFM HERR FMP observer sea days (Table 2, Column K, Row 45) by the product of the VTR effort (Table 1, Column C, Row 45) and the fraction of industry activity with IFM HERR FMP pretrip notification requirements (Table 2, Column H, Row 45). To represent as a percentage, multiply by 100.

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