Northeast Fisheries Science Center Technical Memorandum 334

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US DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Science Center
Woods Hole, Massachusetts

July 2025

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This document may be cited as:

Precoda K and Lyssikatos M. 2025. Allocating Observer Sea Days to New England and Mid-Atlantic Gillnet Fisheries to Monitor Incidental Bycatch of Marine Mammals, 2025-2026. US Dept Commer Northeast Fish Sci Cent Tech Memo 334. 20 p

TABLE OF CONTENTS

INTRODUCTION

The New England and Mid-Atlantic regions of the northwestern Atlantic are home to more than 30 stocks of marine mammals (Figure 1; Hayes et al. 2023). Annual estimates of marine mammal mortality attributed to commercial fishing operations in these regions have been documented since the late 1980s (Blaylock 1995; Hayes et al. 2023).

The 1994 amendments to the Marine Mammal Protection Act (MMPA) require the monitoring of bycatch mortality and serious injury of marine mammals in U.S. Category I and II commercial fisheries. Under section 118 of the MMPA, fisheries that have frequent or occasional incidental mortality and serious injury of marine mammals are defined as Category I and II fisheries, respectively. The New England and Mid-Atlantic gillnet fisheries are both listed as Category I fisheries (List of Fisheries for 2024).

Guidelines have been developed with a goal of obtaining estimates of marine mammal bycatch that are unbiased and have a coefficient of variation less than or equal to 0.30 (or 30%; Wade and Angliss 1997, NMFS 2016). In 2004 the NOAA National Marine Fisheries Service (NMFS) published a report that also recommended a target level of precision on bycatch estimates should be a 20-30% coefficient of variation (NMFS 2004).

This report documents how the Protected Species Division at the Northeast Fisheries Science Center (NEFSC) allocates MMPA-funded fishery observer coverage, in sea days, to support estimation of bycatch mortality estimates of marine mammals in gillnet fisheries in New England (Maine to Connecticut) and the Mid-Atlantic (New York to Cape Hatteras, North Carolina) (Figure 1). An earlier description of the process can be found in Rossman (2007).

CONTEXT

Several marine mammal species are incidentally captured in Category I commercial gillnet fisheries operating off the northeastern United States (Hayes et al. 2023). Fisheries observers monitor bycatch of marine mammals in this region. Observer coverage is directed based on species' MMPA status (endangered, threatened, strategic, or depleted) or based on Take Reduction Plan (TRP) monitoring requirements. Under these criteria, two species are prioritized for observer coverage: harbor porpoise (*Phocoena phocoena phocoena*) and coastal bottlenose dolphin (*Tursiops truncatus truncatus*). In recent years, some observer coverage has also been directed to improve data collection for other species with high bycatch rates (namely gray seals).

In addition, marine mammal bycatch occurs in bottom trawl fisheries off the northeastern United States. However, MMPA funds are not allocated to bottom trawl fisheries for two reasons: firstly, because a relatively high level of observer coverage is funded by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (2007), and secondly, because bottom trawl fisheries are Category II fisheries (Federal Register 2023), with only occasional interactions with endangered, threatened, strategic, or depleted species or species monitored under a TRP.

In addition to observer coverage funded by the MMPA, observers are provided by the Northeast Fisheries Science Center under programs developed to support (a) fish quota monitoring under sector management (i.e., At-Sea Monitoring [ASM]) and (b) estimation of discards of federally

managed fish species by a standardized bycatch reporting methodology (SBRM) in the Northeastern United States (i.e., Northeast Fisheries Observer Program [NEFOP]; McAfee 2024, NEFSC-GARFO 2024). Observers under these programs report incidental takes of marine mammals if they occur, but this observer coverage is assigned without regard to the fisheries, times, and areas where marine mammal bycatch is most likely.

NEFOP observer coverage is directed to fishing trips selected by one of two systems: the Pre-Trip Notification System (PTNS) and the NEFOP Sea Day Schedule (SDS; NEFSC-GARFO 2024). The Northeast multispecies groundfish gillnet fleet is subject to pre-trip notification requirements, and observers are assigned to that fleet by the PTNS; other gillnet fleets that do not have pre-trip notification requirements receive observer assignments from the SDS system.

ASM coverage is aimed at monitoring compliance with Annual Catch Entitlements for the northeast multispecies (groundfish) fishery management plan. At-sea monitors are assigned to fishing trips via the PTNS. ASM coverage complements and is in addition to observer coverage under the MMPA and SBRM.

METHODS

Once species have been selected to prioritize for observation, optimal number of MMPA-funded sea days are calculated, as is commercial gillnet effort from the previous fishing year. Then a decision is made on how to allocate available sea days across two regions, New England (NE) and the Mid-Atlantic (MA). Lastly, the sea days are allocated in proportion to past fishing effort. Steps to allocate annual MMPA-funded observer coverage are as follows:

(1) An estimate of the number of sea days needed to achieve a coefficient of variation (CV) of 0.30 for a bycatch estimate (for each species that is prioritized for observer coverage, within an appropriate fishery (i.e., gillnet) and area (i.e., NE or MA)) is determined from prior-year information. This prior-year information includes the number of observed trips, the average fishing days absent per observed trip, and the CV of the previous bycatch estimate. The number of sea days expected to be accomplished under other observer/monitoring programs whose primary goal is other than observing marine mammal bycatch is subtracted from the projected number of sea days needed. The number of sea days remaining is then adjusted upward if the previous year's rate or anticipated rate of accomplishing the sea days is less than 100%.

(2) In New England, the fishing effort in a previous year, represented by the number of days fished, is calculated for each stratum. Strata are defined by mesh size (large or extra large), month, and trip selection system. MMPA-funded sea days will be divided between PTNS and SDS trip selection systems according to the proportions of effort eligible for selection by the PTNS and SDS systems in the previous year. The total effort in sea days per stratum is then converted into proportions of the total New England gillnet fishing days.

(3) In the Mid-Atlantic, the number of days fished in a previous year is calculated for each stratum in each of three subregions. The three Mid-Atlantic subregions are (i) northern North Carolina (north of Cape Hatteras), (ii) Virginia, and (iii) a northern Mid-Atlantic

subregion, which includes Maryland, Delaware, New Jersey, and trips west of 72.5°W and within NOAA Fisheries Statistical Reporting Areas 612-623.[1] In North Carolina, strata are defined by county, water body (0-3 nautical miles offshore or 3-200 nautical miles offshore), mesh size (small, i.e., under 5", or large, i.e., 5" or larger), and month. In Virginia, strata are defined by county, water body (ocean or lower Chesapeake Bay), and month. In the northern Mid-Atlantic, strata are defined by mesh size (large is at least 5.5" and smaller than 8"; extra-large is 8" or larger) and month. The days fished per stratum are then converted into proportions of total Mid-Atlantic gillnet fishing days.

(4) The total number of MMPA-funded sea days that can be allocated is calculated from available funds and the cost of an observer sea day. A decision is made as to how to allocate these sea days across New England versus Mid-Atlantic regions or subregions within those two regions (for example, New England, northern Mid-Atlantic, and Virginia and northern North Carolina). Hereafter, "region" should be understood to mean either region or subregion.

(5) The number of observer sea days allocated to each region or subregion is multiplied by the proportion of past total sea days (i.e., fishing effort) in each region and rounded to integer days. Small changes to the allocation derived from this series of steps may be made manually if rounding results in fewer or more days being allocated than intended to a region.

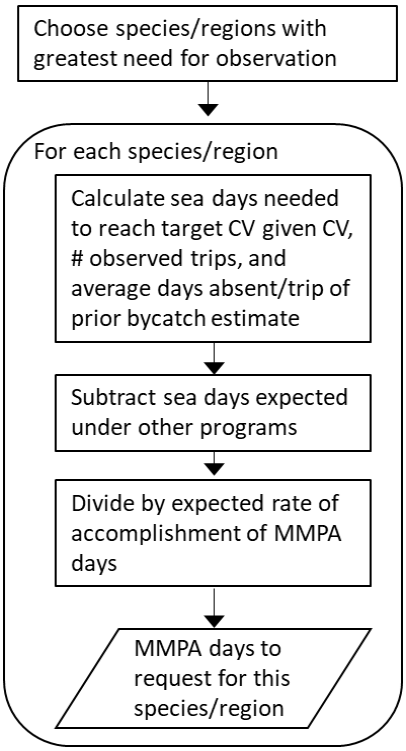
These steps are described in greater detail below.

Step (1)

The first step projects the number of sea days and sampled fishing trips required to achieve a 30% CV for the bycatch estimate for each species and region that has been identified as having the greatest need for observation (e.g., harbor porpoise in the New England region). The fishing trip is the sample unit on which a fisheries observer is deployed and fisheries bycatch data are recorded. This step is summarized in the graphic below.

A practical limitation is the general insufficiency of funds to allocate MMPA-funded observer coverage at the level required to achieve a 30% CV in each of the selected marine mammal bycatch regions.

[1] https://www.fisheries.noaa.gov/resource/map/greater-atlantic-region-statistical-areas



The bycatch analyses use stratified data, with each region potentially including multiple strata. The stratification scheme is an implicit method to optimally allocate observer sea days, as it reflects the inherent spatial and temporal variability characteristic of bycatch interactions. The stratified bycatch estimates and their associated levels of precision (Table 1) are used in the sea day projection equation below. The estimates and precision are derived from observations recorded by NEFOP and ASM staff and are reported at regular intervals (e.g., Lyssikatos 2022, Precoda 2024).

The projected CV for a fishery (i.e., gillnet) and region is calculated as the prior observed bycatch CV multiplied by the square root of the ratio of sampled trips to projected sampled trips from that fishery and region (Fogarty and Gabriel 2002):

$$cv_{projected} = cv_{observed} \times \sqrt{\frac{n_{observed}}{n_{projected}}} = \frac{cv_{observed}}{\sqrt{n_{relative}}}$$

where $cv_{projected}$ = projected CV, $cv_{observed}$ = prior observed bycatch CV, $n_{observed}$ = number of prior sampled trips, $n_{projected}$ = number of projected sampled trips, and $n_{relative}$ = relative change in the number of sampled trips (= $n_{projected}/n_{observed}$). The projected CV is set to the desired CV (30%) to calculate $n_{projected}$. The number of sampled fishing trips required is converted to a number of sea days required by multiplying by the average duration of a trip in each region. The average trip duration is derived from observed trip length data (reported as days absent, defined as 1 plus the date of landing minus the date of sailing) recorded by the NEFOP and ASM.

Next, the number of days expected to be achieved by other sampling programs is estimated. The number of observed sea days under the SBRM program in each region is estimated as equal to

the number of SBRM sea days proposed in the previous year, and is multiplied by the previous year's rate of accomplishing SBRM sea days (Table 2). This yields an expected number of SBRM days that may be accomplished. Similarly, the anticipated number of ASM sea days for each region is estimated as the number of ASM sea days accomplished the previous year. The numbers of SBRM and ASM sea days expected to be accomplished are subtracted from the number of sea days required to achieve the target CV. The resulting number of MMPA-funded sea days needed is then multiplied by the likely rate of accomplishment of MMPA-funded sea days to calculate the number of MMPA-funded sea days to request (Table 2).

Historically, these calculations did not include summer fishing in the New England gillnet fishery because harbor porpoise bycatch is rarer during the summer months (Precoda and Orphanides 2022, Precoda 2023). However, in some years summer bycatch may occur, and harbor porpoise bycatch estimates are based on observer data from all months. In addition, gray seal bycatch is often high in the summer months. Therefore, the New England calculations now include all months of the year (as do calculations in other regions).

Step (2)

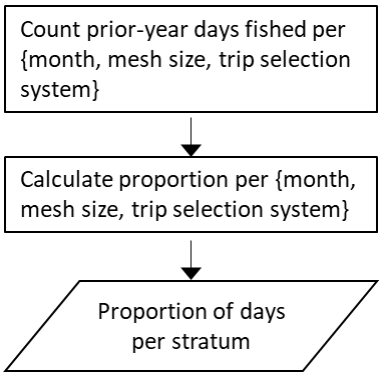
In this step, the number of prior-year fishing days reported on Vessel Trip Reports[2] (VTR) in each stratum in New England is counted, with strata defined by month, mesh size (large, i.e., mesh at least 5.5" and smaller than 8", or extra large, i.e., mesh 8" or larger[3]), and trip selection system (PTNS or SDS). The VTR database contains records of all seafood transactions from commercial fishing trips landing federally regulated species. This database is considered to represent a complete census of commercial fishing trips[4] and, therefore, is used to determine the fishing effort, in terms of number of trips, for states other than North Carolina and Virginia, including all New England states. The most recent year for which VTRs are available is used; for the fishing year beginning in 2025, this meant data from 2023. The number of fishing days per trip, or the number of days absent on each trip, is defined as 1 plus the date of landing minus the date of sailing.

The days fished per stratum are then converted into proportions of total New England gillnet fishing days.

[2] https://www.fisheries.noaa.gov/vessel-trip-reporting-greater-atlantic-region

[3] Observer sea days are not assigned to trips with mesh sizes smaller than 5.5", as these trips rarely have marine mammal bycatch.

[4] The VTR database contained slightly less than a census over a time period roughly encompassing 2023, when landings coded "other finfish" (OFF) were dropped from the database, until about January 2024, when OFF was no longer available as a valid species code.



Step (3)

In the Mid-Atlantic, the number of days fished in a previous year is calculated for each stratum in each of three subregions: northern North Carolina (north of Cape Hatteras), Virginia, and a northern Mid-Atlantic subregion. Strata in North Carolina and Virginia align with (1) temporal and spatial strata used in the analysis of coastal bottlenose dolphin bycatch, (2) regulatory mesh size categories defined by the Bottlenose Dolphin Take Reduction Plan, and (3) available commercial gillnet effort data across North Carolina and Virginia. In North Carolina, strata are defined by month, county, water body (state waters, 0-3 nautical miles offshore, or federal waters, 3-200 nautical miles offshore), and mesh size (small, with mesh smaller than 5", or large, with mesh 5" or larger). In Virginia, strata are defined by month, county or county equivalent, and water body (ocean or lower Chesapeake Bay). In the northern Mid-Atlantic, strata are defined by month and mesh size (large, with mesh at least 5.5" and smaller than 8", or extra large, with mesh 8" or larger); mesh size and month are used in the analysis of harbor porpoise bycatch in the Mid-Atlantic. The northern Mid-Atlantic includes trips from Maryland, Delaware, or New Jersey, as well as trips west of 72.5°W and within statistical areas 612-623 (NMFS 2023). Long Island Sound (statistical area 611) is excluded. The purpose of requiring the statistical area to be no greater than 623 is to exclude any trips that were missing state information and that might be more likely to be from Virginia or North Carolina than from a state farther north.

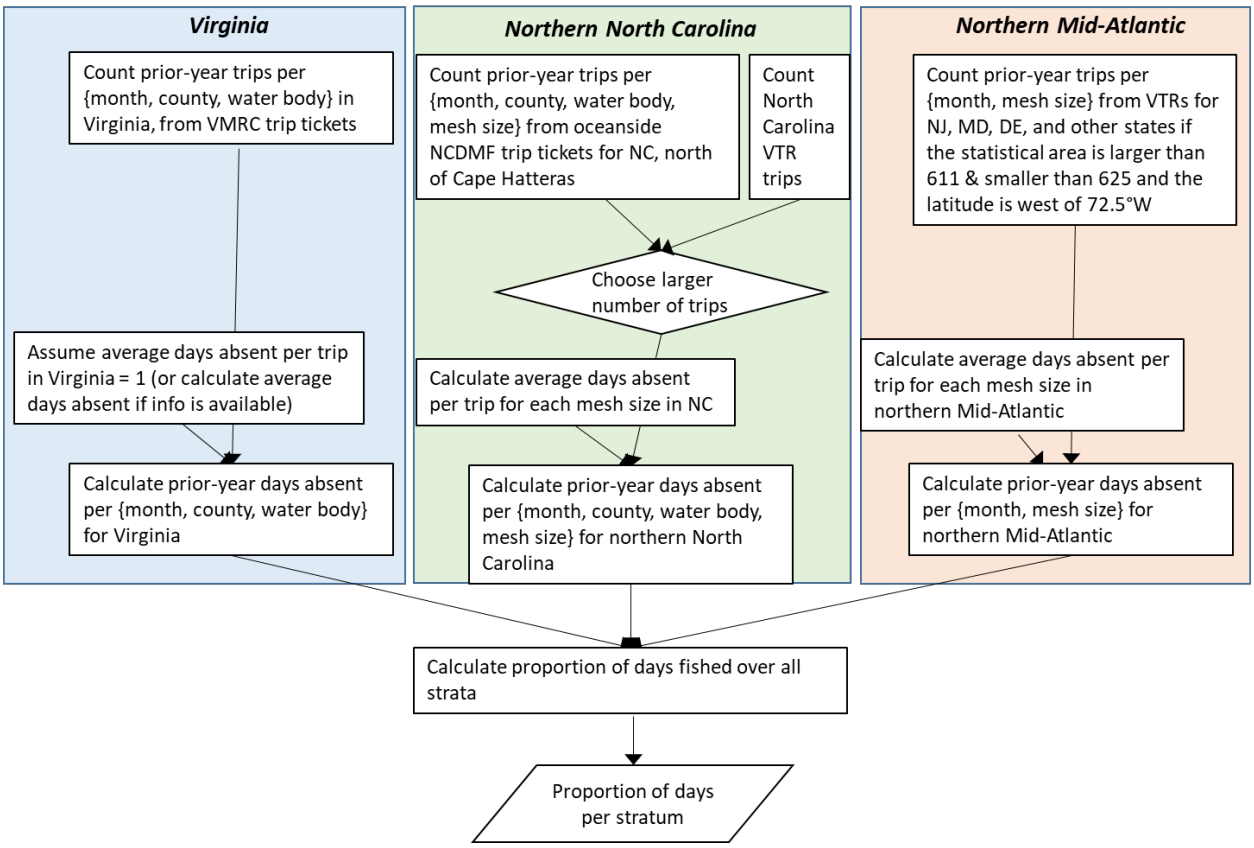
For states in the northern Mid-Atlantic, the VTR database is used to determine the number of fishing trips. Some fishing effort in North Carolina is not reported in the VTR database, because it is in non-federally regulated fisheries. Consequently, the number of North Carolina VTR trips is compared with the number of trips from North Carolina Division of Marine Fisheries (NCDMF) trip ticket data, and the larger of the two numbers of trips is taken as the number of prior-year oceanside fishing trips from North Carolina north of Cape Hatteras. MMPA-funded sea days are only allocated north of Cape Hatteras, the jurisdiction covered by the NEFSC. Typically, the number of trips in NCDMF trip tickets is larger than the number of North Carolina VTRs. For Virginia, prior-year trips that were reported on Virginia Marine Resources Commission (VMRC) trip tickets and stored in the Atlantic Coast Cooperative Statistics Program (ACCSP) Data Warehouse[5] are counted per water body and county or county equivalent. If the VMRC area is reported as “Chesapeake Bay and Virginia Shore” (with subarea “offshore waters”, “Lynnhaven Bay”, or “Chincoteague Bay”) or as “Wright Brothers Monument to

[5] https://www.accsp.org/

NC/VA line", the water body is assigned to "ocean". If the VMRC area is reported as "Chesapeake Bay and Virginia Shore" with subarea "Chesapeake Bay – Lower – East – VA" or "Chesapeake Bay – Lower – West – VA", the water body is assigned to "low Ches Bay".

VTRs and trip tickets for the most recent year available are used. For the fishing year beginning in April 2025, this meant data from calendar 2023.

The trips in each stratum and each subregion are multiplied by the average number of days absent per trip (per mesh size, in North Carolina and the northern Mid-Atlantic). The number of days at sea is rarely or never recorded in VMRC trip ticket data, and the average length of a Virginia trip is assumed to be one day based on historical observed and VTR trips reported by Virginia gillnet vessels. The days fished per stratum are then converted into proportions of total Mid-Atlantic fishing days.



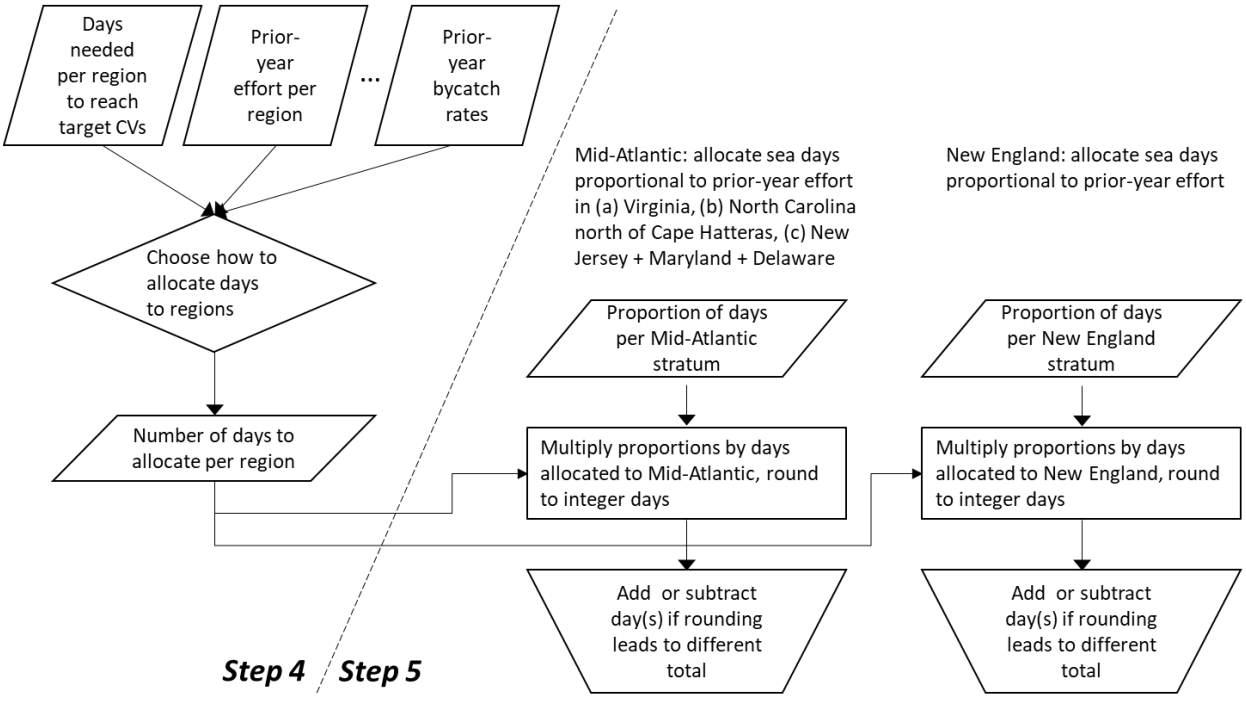
Step (4)

Although guidelines direct the bycatch monitoring programs to achieve a target CV, the number of MMPA-funded observer sea days that can be allocated is constrained by available funds and the cost of an observer sea day (described in Step 1). These MMPA-funded sea days are divided across regions or groups of strata (for example, groups could be New England, northern Mid-Atlantic, and Virginia and northern North Carolina). For the 2025-26 fishing year, which runs from April 2025 through March 2026, the allocation according to CV in Table 3 would result in no MMPA-funded sea days in the New England gillnet fishery. However, the sampling protocol

on MMPA-funded observer trips differs from that of other observer programs, which do not prioritize monitoring for marine mammal bycatch. In addition, the New England gillnet fishery is of concern to the Harbor Porpoise Take Reduction Team, as that fishery is where most harbor porpoise bycatch is observed. In an effort to provide some MMPA-funded coverage of the New England gillnet fishery, sea days were divided between New England and the Mid-Atlantic as a whole in an approximately 30/70 ratio. This ratio balances several factors: (a) New England currently receives relatively good observer coverage from other, non-MMPA-funded observer programs, (b) MMPA-funded sea days in the New England gillnet fishery help reduce the number of bycatch that might be missed by observers following other protocols that are not focused specifically on marine mammal bycatch (Precoda and Orphanides 2024), (c) the Mid-Atlantic has a high priority because of the need to monitor harbor porpoise takes in an area with changing regulations, and to monitor coastal bottlenose dolphin bycatch, but (d) the accomplishment rate for MMPA-funded sea days in northern North Carolina is relatively low (Table 2), so days allocated there may not be accomplished. Some alternative approaches to dividing the total sea days across regions or groups of strata are noted in the Appendix for consideration when strictly adhering to the bycatch monitoring guidelines does not result in optimal allocation of resources.

Step (5)

The number of days allocated to each region is then multiplied by the proportion of past sea days in each region and rounded to integer days. Because of rounding, the total number of days allocated in this manner may not be equal to the number that can be allocated, and days may be added or subtracted manually to reach the total number of MMPA-funded sea days.



After the available observer sea days have been allocated across strata, a complete MMPA observer sea day schedule is generated for gillnet fisheries ranging from Maine to Cape Hatteras, North Carolina.

2025-26 RESULTS

Table 1 is a summary of the baseline data used to project the annual observer coverage (in sea days) needed to estimate the bycatch of three marine mammal species in the U.S. Atlantic gillnet fishery. Table 2 compares the baseline coverage and associated bycatch CVs in each sampling stratum with the coverage required to achieve a 30% CV for the bycatch estimates. Table 3 shows the number of sea days that would be allocated to each region based on the proportion of sea days required to achieve the target CV for all targeted species and regions. To achieve a 30% CV for harbor porpoise bycatch in the Mid-Atlantic gillnet fishery, 3587 MMPA-funded sea days would be requested; this exceeds the 350 days available. If 217 days were allocated (Table 3), the projected CV would be 93%. For the 2025-26 fishing year, the total number of sea days available for observing marine mammal interactions across both the New and Mid-Atlantic regions was 350. These 350 days were allocated to New England and the Mid-Atlantic in a 30/70 ratio (see Step 4 above for factors considered in selecting this ratio). This corresponded to 106 and 244 MMPA-funded sea days in New England and the Mid-Atlantic, respectively. The projected bycatch CVs given the expected accomplishments of MMPA-funded and other sea days are shown in Table 4.

Tables 5, 6, 7, and 8 show the number of trips taken in 2023 in each stratum in New England, Virginia, North Carolina (north of Cape Hatteras), and the northern Mid-Atlantic, respectively. Tables 9 and 10 give the allocations of MMPA observer sea days to strata in New England and in the Mid-Atlantic for the 2025-26 fishing year.

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FIGURES

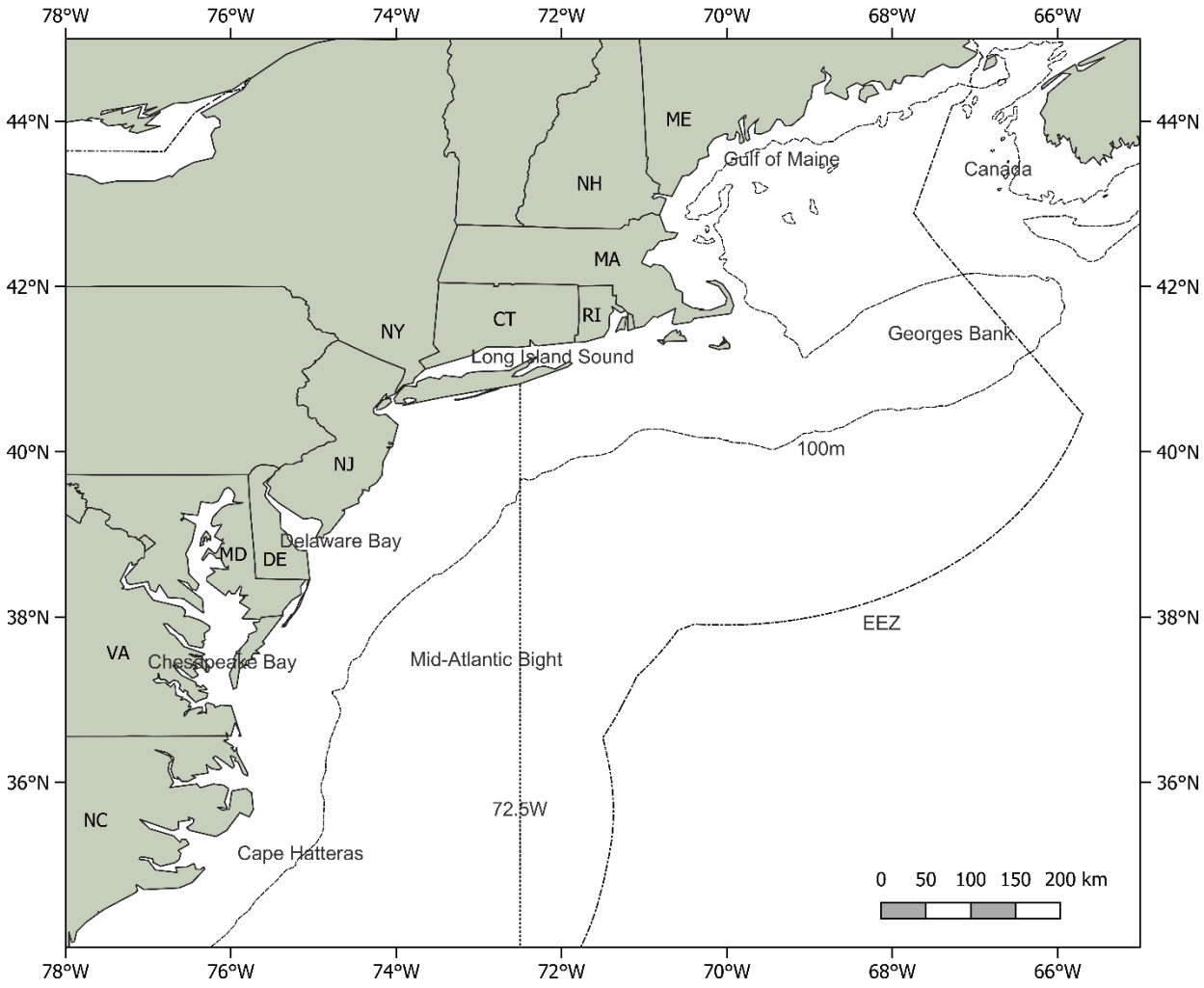

Figure 1. New England and Mid-Atlantic regions of the northeastern U.S. continental shelf. The line at 72.5°W divides the Mid-Atlantic region to the south and west from the New England region to the north and east.

TABLES

Table 1. Information used in allocating gillnet observer sea days by region, protected species of concern, year, stratified coefficient of variation (CV) for the bycatch estimate, number of trips and sea days observed, mean MMPA-observed trip duration, and stratum number. Virginia and northern North Carolina are further divided before sea days are allocated by mesh size and federal versus state waters (for North Carolina) or by port and water body (for Virginia).

Region	Species	Bycatch Estimate Year	Bycatch Estimate CV	Relative Change (($CV_{observed}$ * CV_{target})^2)	Trips Observed	Mean Trip Duration (days)
New England	Harbor porpoise	2023	0.21	0.49	756	1.60
Mid-Atlantic	Harbor porpoise	2019	0.51	2.89	729	1.01
Virginia and northern North Carolina	Coastal bottlenose dolphin	2018	0.95	10.03	122	1.01

Table 2. Number of trips and sea days needed to achieve target CV=0.3 given past information in Table 1, modified by expected accomplishment rate and expected number of observer sea days from other programs.

Region	Species	Target Number of Trips	Target Number of Days	Expected Accomplishment Rate of MMPA Days	Expected Days Accomplished under Other Programs	MMPA Days to Request
New England	Harbor porpoise	370	594	1.11	120 (SBRM) + 874 (ASM)	0
Mid-Atlantic	Harbor porpoise	2107	2128	0.58	58 (SBRM)	3587
Virginia and northern North Carolina	Coastal bottlenose dolphin	1223	1240	0.51	107 (SBRM)	2207

Table 3. Allocation of sea days in proportion to those needed to achieve CV=0.3 for all strata in Table 1.

Region	MMPA Days to Request	Proportion	Days to Allocate
NE	0	0	0
MA	3587	0.619	217
NCVA	2207	0.381	133
Total	5794	1.0	350

Table 4. Allocation of sea days to New England and Mid-Atlantic by 30/70 split and projected CVs given MMPA-funded sea days and expected days accomplished under other programs (Table 2).

Region	Species	MMPA-funded Days to Allocate for 30/70 Split	Projected CV given 30/70 Split
New England	Harbor porpoise	106	0.22
Mid-Atlantic	Harbor porpoise	45 in Northern Mid-Atlantic + 199 in NC/VA	0.79
Virginia and northern North Carolina	Coastal bottlenose dolphin	199	0.73

Table 5. New England trips taken per mesh size, month, and trip selection system in 2023. Small mesh is smaller than 5.5", large mesh is at least 5.5" and smaller than 8", and extra-large mesh is 8" or larger.

Mesh	Trip Selection System	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
SM	PTNS	0	0	0	0	0	0	0	0	0	0	0	0
SM	SDS	0	0	0	0	0	0	0	0	0	0	0	0
LG	PTNS	74	30	11	25	22	100	127	172	134	122	71	90
LG	SDS	0	0	0	4	8	0	0	1	0	9	0	2
XLG	PTNS	35	28	44	25	33	233	430	453	322	195	69	32
XLG	SDS	80	73	67	141	240	155	4	17	10	10	19	45

Table 6. Virginia trips taken per county or county equivalent, water body, and month in 2023. The mean number of days absent is assumed to be 1 for all strata, as the majority of these trips are believed to be day trips.

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Days Absent
Accomack, VA, low Ches Bay	0	0	5	0	0	0	0	0	0	0	1	1	1
Accomack, VA, ocean	0	5	27	216	102	89	43	165	161	254	77	23	1
Gloucester, VA, low Ches Bay	0	0	0	0	0	0	0	0	1	0	0	0	1
Hampton City, VA, low Ches Bay	0	0	0	31	76	85	68	151	218	150	55	8	1
Hampton City, VA, ocean	0	0	0	0	3	9	0	0	0	0	29	11	1
James City, VA, low Ches Bay	21	23	37	84	40	0	0	0	0	0	0	28	1
Mathews, VA, low Ches Bay	19	39	33	44	43	244	162	134	174	139	3	9	1
Newport News City, VA, low Ches Bay	0	0	0	0	0	0	0	0	0	0	1	24	1
Norfolk City, VA, low Ches Bay	0	0	1	0	0	0	0	0	0	0	0	0	1
Northampton, VA, low Ches Bay	0	6	10	29	8	0	8	44	55	67	46	23	1
Northampton, VA, ocean	11	1	0	0	0	0	0	1	0	0	0	0	1
Poquoson, VA, low Ches Bay	0	10	37	2	0	0	11	10	104	92	18	17	1

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Days Absent
Poquoson, VA, ocean	1	3	19	0	0	1	4	9	67	26	92	11	1
Suffolk City, VA, low Ches Bay	0	5	6	0	0	30	42	8	0	0	0	0	1
Virginia Beach City, VA, low Ches Bay	1	1	1	2	2	0	0	2	16	92	49	9	1
Virginia Beach City, VA, ocean	105	24	12	0	5	15	46	5	0	14	4	63	1
York, VA, low Ches Bay	0	0	0	0	0	7	0	0	0	1	3	2	1

Table 7. North Carolina trips taken north of Cape Hatteras, per mesh size, county, water body (state or federal waters), and month in 2023. Small mesh is smaller than 5" and large mesh is 5" or larger. State waters are 0-3 nautical miles offshore; federal waters are 3-200 nautical miles offshore.

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Days Absent
large, Dare, NC, state	1	0	0	0	4	7	1	16	6	6	4	0	1.096
large, Hyde, NC, federal	0	0	0	0	0	2	0	0	0	0	0	0	1.096
large, Hyde, NC, state	0	0	1	1	0	0	0	0	0	0	0	0	1.096
small, Dare, NC, federal	93	25	32	14	1	2	1	0	4	10	14	23	1.026
small, Dare, NC, state	76	33	25	64	27	20	6	0	32	38	39	40	1.026
small, Hyde, NC, state	9	2	0	0	0	0	0	0	0	0	0	1	1.026

Table 8. Northern Mid-Atlantic trips taken per mesh size and month in 2023. Large mesh is at least 5.5" and smaller than 8". Extra-large mesh is 8" or larger.

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Days Absent
Northern M-A, large	35	10	28	111	115	133	11	14	21	128	159	83	1.046
Northern M-A, xlarge	98	23	2	18	69	3	0	0	0	1	41	55	1.168

Table 9. Allocation of days to New England for the 2025-26 fishing year, proportional to prior-year effort.

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Days
LG, PTNS	2	1		1	1	3	4	5	4	3	2	3	29
XLG, PTNS	1	1	1	1	1	7	12	13	9	5	2	1	54
XLG, SDS	2	2	2	4	7	4					1	1	23

Table 10. Allocation of days to the Mid-Atlantic for the 2025-26 fishing year, proportional to prior-year effort.

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Days	Mean Days Absent
Accomack, VA, ocean			1	8	4	3	2	6	6	10	3	1	44	1.000
Hampton City, VA, low Ches Bay				1	3	3	3	6	8	6	2		32	1.000
Hampton City, VA, ocean											1		1	1.000
James City, VA, low Ches Bay	1	1	1	3	1							1	8	1.000
Mathews, VA, low Ches Bay	1	1	1	2	2	9	6	5	7	5			39	1.000

Stratum	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total Days	Mean Days Absent
Newport News City, VA, low Ches Bay												1	1	
Northampton, VA, low Ches Bay				1				2	2	3	2	1	11	1.000
Poquoson, VA, low Ches Bay			1						4	3	1	1	10	1.000
Poquoson, VA, ocean			1						3	1	3		8	1.000
Suffolk City, VA, low Ches Bay						1	2						3	
Virginia Beach City, VA, low Ches Bay									1	3	2		6	1.000
Virginia Beach City, VA, ocean	4	1				1	2			1		2	11	1.000
large, Dare, NC, state								1					1	1.096
small, Dare, NC, federal	4	1	1	1							1	1	9	1.026
small, Dare, NC, state	3	1	1	2	1	1			1	1	2	2	15	1.026
large, Northern M-A	1		1	4	5	5		1	1	5	6	3	32	1.046
extra-large, Northern M-A	4	1		1	3						2	2	13	1.168

APPENDIX

This document has described how MMPA sea days have been allocated in recent years. Periodically, reassessing whether the allocation strategy remains appropriate may be worthwhile, given potentially changing constraints. For future reference, below are noted a few possible ways to divide the MMPA sea days across regions:

(a) each stratum receives a number of sea days proportional to its fraction of the total number of trips needed to achieve target CVs across all strata

(b) each group of strata receives sea days according to that group's fraction of the total effort across all groups

(c) a species and region is prioritized and days are allocated to achieve the target CV for the prioritized species and region

(d) a different species and region is prioritized each year and days are allocated to achieve the target CV for the prioritized species and region (e.g., a rotational sampling program, Didier and Cornish 1999)

(e) one species and region is prioritized and days are allocated to provide sufficient coverage to ensure at least 95% probability of observing at least one take of that species in that region, given that one or more takes occur (e.g., using the calculator in Curtis & Carretta 2020)

(f) groups of strata receive sea days according to another division, such as allocating 50% to New England and 50% to the Mid-Atlantic

Other aspects of the process that could be considered include:

1. How should species/regions to target for coverage be selected, and are the selected species/regions equally important? Historically, species have been selected that have TRTs or are endangered, threatened, strategic, or depleted, and the species selected have been considered of equal importance.

2. Should the CV of the bycatch estimate be the only metric used to calculate how many sea days would be desirable for a species/region or should some combination of metrics be used?

3. A possible strategy would be to achieve a minimum level of coverage in each stratum (possibly based on sea days not funded by the MMPA), and then allocate MMPA days to optimize coverage beyond that minimum in particular strata. What are the benefits and costs of such a strategy?

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