

2015
Standardized Bycatch Reporting Methodology
Annual Discard Report with Observer Sea Day Allocation

by

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Introduction

The Standardized Bycatch Reporting Methodology (SBRM) Omnibus Amendment was implemented on 27 February 2008 (NMFS 2008, NEFMC 2007) and later vacated by the US District Court for the District of Columbia and remanded back to National Marine Fisheries Service (NMFS) on 15 September 2011 due to a deficiency associated with the prioritization process, an element of the amendment. On 29 December 2011, NMFS removed the regulations implementing the SBRM (NMFS 2011). A revised SBRM Omnibus Amendment (NEFMC 2015), hereafter referred to as the 2015 SBRM amendment, was approved on 13 March 2015 and a final rule is pending.

The 2015 SBRM amendment requires an annual discard report utilizing information obtained from the Northeast Fisheries Observer Program¹ (NEFOP) for 14 federally managed species and sea turtles (Table 1). Specifically, the SBRM annual discard report requirements include: “...*summaries of the trips observed, fishing modes in the relevant time period, funding issues and other related issues and developments, and projections of coverage across fisheries for upcoming time period. More detailed information would be provided in tables and figures that addressed: The number of observer trips and sea days scheduled that were accomplished for each fishing mode and quarter, as well as the number of trips and sea days of industry activity; the kept weight from unobserved quarters and statistical areas summarized by fishing mode; the amount kept and estimated discards of each species by fishing mode; and the relationship between sample size and precision for relevant fishing modes.*” (NEFMC 2015, pages 237-238).

This document contains a compilation of the information to meet the 2015 SBRM annual discard report requirements. For fish and invertebrate species groups, several of the required annual discard report elements can be found in Wigley et al. 2015, along with a description of the data sources, methods, results, and discussion. Similarly, for sea turtles, further information can be found in Murray 2012, 2013, and in review. This document also presents the number of sea days needed to monitor the 15 species groups, the funding available for observer coverage, and the numbers of sea days allocated by fleet² (where a fleet represents gear type, access area, trip category, region, and mesh group combinations) for the April 2015 through March 2016 period.

Summary of Observer Coverage

A total of 3,508 trips (10,800 days) was observed during the July 2013 through July 2014 time period. When these trips were stratified by fleet and quarter, some trips were partitioned between fleets resulting in 3,729 trips (11,335 days). See Tables 2 and 3 in Wigley et al. 2015 for a summary of the number of observed trips and industry trips by fleet and calendar quarter and a summary of the number of observed sea days and industry sea days by fleet and calendar quarter, respectively. There were 56 fleets uniquely identified in the July 2013 through June 2014 data. Based upon the industry activity during this time period, the Mid-Atlantic (MA) and New England (NE) twin trawl

¹ Further information on the Northeast Fisheries Science Center’s Northeast Fisheries Observer Program is available at <http://www.nefsc.noaa.gov/fsb/>

² Fleets are synonymous with “fishing modes”.

fleets (Rows 13 and 14, respectively) and the NE haddock separator trawl small mesh exempted fleet (Row 56) were added to the collection of fleets analyzed.

A spatial and temporal analysis of the kept weight of all species from statistical areas and calendar quarter was conducted. Over all fleets, 52% of kept weight of all species occurred in statistical areas and calendar quarters that had observer coverage. For a summary of the percentage of kept weight with observer coverage by fleet for the July 2013 through June 2014 time period, see Table 4 in Wigley et al. 2015.

Summary of Discard Estimates

For fish/invertebrate species, the total catch, kept, and estimated discards (in live weight) and their associated coefficient of variation (CV) were derived for fleets using data collected during the July 2013 through June 2014 time period (Wigley et al. 2015). Based upon that discard estimation analysis, an estimated 64,795 mt (142,848,902 pounds) of federally regulated species were discarded (Table 2). Fleet abbreviations used in this report are described in Appendix Table 1. See Table 5A and 5B in Wigley et al. 2015 for summaries by fleet and SBRM species group and by fleet and individual species that compose these 14 species groups, respectively.

The most recent average annual estimates of sea turtle interactions in U.S. Mid-Atlantic commercial fisheries are listed in Table 3. Estimates are summarized by gear type, and estimates with associated CVs allocated across managed fish species can be found in the references cited. The CVs around the estimates allocated across managed fish species were used to estimate coverage needs in 2015, per methods used in Murray (2012).

Summary of Sea Days Needed

For fish/invertebrate species groups, the number of sea days needed to achieve a 30% CV of total discards for each species group was derived for 56 fleets by using data collected during July 2013 through June 2014 (Wigley et al. 2015). Based on that sample size analysis, a total of 11,204 sea days is needed for the 14 fish and invertebrate species groups. Table 4 presents the number of sea days needed for each of the 14 species groups, number of pilot coverage days, and number of minimum pilot days. Total number of sea days needed for fish/invertebrate groups for each fleet is also given in Table 5 (Step 1).

The use of pilot coverage in the sample size analysis may result in too much coverage in cases where little or no observer coverage may actually be needed, when effort changed sharply between years, or when the fleet effort comprises only a few trips. For example, there are 12 fleets for which there were fewer than 3 Vessel Trip Report (VTR) trips per quarter for at least 1 quarter (Rows 10, 13-17, 22, 26, 30, 32, 40, and 43; Appendix Table 2). To allocate sea days based on pilot coverage to these fleets for these quarters would result in coverage rates exceeding 100%. Additionally, there are several fleets for which activity is greater than 3 VTR trips per quarter, but overall trip activity is low (e.g., Rows 9, 12, 21, 31, 39, and 46; Appendix Table 2). To allocate sea days based on pilot coverage to these fleets would result in coverage rates that generally exceed those derived from observer data. For fleets with low quarterly trip activity, there are 2 scenarios: (1) fleets for which

significant activity occurs in other quarters (e.g., Rows 19, 30, and 43; Appendix Table 2); and (2) fleets for which overall activity is low (e.g., Rows 9, 10, 12-17, 22, 26, 40, and 56; Appendix Table 2). In the first scenario, the use of pilot coverage is warranted for these fleets. In the second scenario, pilot coverage is not warranted.

A refinement to the sample size analysis was developed in 2014 to address the potential for excessive observer coverage created by using a pilot coverage policy for fleets with overall low activity. Pilot coverage had been designed to provide the minimum number of trips sufficient to compute the variance of discard estimates and subsequently the derivation of sea days needed. The number of sea days per quarter could not be reduced further without omitting the fleet from the sample size analysis. A standardized approach, similar to the 2 filters used in the importance filter (Wigley et al. 2007), was employed to remove fleets with overall low trip activity. This approach hereafter is referred to as the trip filter. In the trip filter, the percentage of VTR trips for a fleet was derived by dividing the number of VTR trips in a fleet by the total number of VTR trips across all fleets. The fleets were then ranked (smallest to largest) by the percentage of trips in a fleet and the cumulative percentage for each fleet was then derived. A cut point of 1% was selected to remove fleets that contained the lowest cumulative 1% of the total trips. Thus the trip filter excludes those fleets, which in aggregate, constitute less than 1% of all commercial fishing activity. Fleets which constitute the upper cumulative 99% of all trips remain in the analysis.

Before the trip filter was applied, trips associated with the MA shrimp trawl fleet (Row 19) were partitioned into two groups: trips fishing in Pamlico Sound and trips fishing in ocean waters. This partitioning was needed because the Southeast Region has mandatory observer coverage of the southeastern shrimp fishery and allocates observer coverage to trips fishing in Pamlico Sound (Scott-Denton 2012). Of the 405 trips in the MA Shrimp trawl fleet (Appendix Table 2, Row 19), 12 trips occurred in ocean waters. The total number of trips for the MA shrimp trawl fleet (Row 19) was adjusted from 405 trips to 12 trips before the trip filter was applied. When the trip filter was applied, 21 of the 56 fleets were removed (Rows 9, 10, 12-17, 19, 21, 22, 26, 31, 32, 39, 40, 46, 49, 50, 52, and 56; Appendix Table 2; Table 5, Step 2). For the remaining 35 fleets (28 agency-funded and 7 industry-funded fleets), a total of 10,365 sea days is needed for the 14 fish/invertebrate species groups (Table 5; Step 2). It is useful to note that the trip filter does not remove sea days associated with fleets that have discards determined to be important. Implications of the trip filter are discussed later.

For loggerhead turtles, the numbers of sea days needed to achieve a 30% CV of turtle discards were estimated by fishery, defined as a managed fish or invertebrate species landed on vessels using bottom otter trawl, sink gillnet, or scallop dredge gear in the Mid-Atlantic region (see Murray 2012, and Murray 2013). The maximum amount of projected coverage across all the fisheries was considered the desired level of sampling to monitor turtle discards for that gear type. Roughly 3,300 days are needed across bottom trawl fisheries (Murray in review, and sea day estimation methods in Murray 2012), roughly 2,600 days are needed across sink gillnet fisheries (based on CVs in Murray 2013 and sea day estimation methods in Murray 2012), and approximately 1,300 days are needed in the scallop dredge fishery, based on loggerhead bycatch precision levels after chain mats were implemented in the fishery (Murray 2012). Estimates of sea day needs for turtles are revised when new bycatch estimates are published for a particular gear type (approximately every 5 years).

Recent estimates of loggerhead interactions (i.e., “takes”) and coverage needs in the scallop dredge fishery are currently being evaluated. Since May 2013, the use of turtle deflector dredges (TDDs) with chain mats have been required on scallop dredges in times and areas where loggerheads are known to be most common. These modifications are intended to reduce those interactions in which animals are landed or observed from the deck, although other “unobservable” interactions may still be occurring (i.e., those in which animals escape from the gear or come in contact with the gear but are not captured and brought to the surface where they can be observed; Warden and Murray 2011). Owing to the fairly recent implementation of TDDs and the possibility of large interannual availability of turtles to scallop fishing areas, more time is needed to confirm the apparent effectiveness of TDDs and chain mats in eliminating observable interactions. Therefore, in 2015 observers will continue to be used to monitor the dredge fleets for turtle interactions. However, further work is being conducted to examine the utility of observers for monitoring turtle interactions in these fleets, particularly if it becomes clear that all or most of the interactions are “unobservable.” If additional filters are applied in future cases where turtle interactions are successfully eliminated or become unobservable, coverage levels in the affected fleet will be driven by other species groups.

Sea day requirements for non-loggerhead turtle species (i.e., greens, Kemp’s ridleys, and leatherbacks) are not currently estimated because too few have been observed to estimate total bycatch and CVs for these species (Murray 2012). Because observers document all protected species interactions on trips, monitoring of other turtles species will still occur via days intended to monitor fish or loggerheads.

The numbers of sea days needed to achieve a 30% CV associated with the Mid-Atlantic³ turtle gear types and fish/invertebrate fleets are given below and in Table 5, Steps 2 and 3.

Turtle Gear Types and Fish/Invertebrate Fleets	Sea Days Needed	
	Loggerhead Turtles	Fish/Invertebrate Species Groups
MA Otter Trawl, MA Scallop Trawl, MA Ruhle Trawl, and MA Haddock Separator Trawl Rows 5, 6, 9-12, and 15	3,309	1,323
MA Gillnet Rows 23-25	2,593	147
MA Scallop Dredge Rows 31, 33, 35, and 37	1,293	304

³ In the sea turtle sample size analysis, Mid-Atlantic refers to areas fished west of 70°W. In the fish/invertebrate sample size analysis, Mid-Atlantic refers to region based on port of departure from Connecticut and southward. Although it is recognized that port of departure may differ from the area fished, an odds ratio analysis conducted to evaluate broad-scale spatial coherence indicated a strong relationship between area fished (statistical area) and port of departure (region). Based upon this analysis, the “Mid-Atlantic” stratifications used in the 2 analyses were considered similar.

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

- If the sum of the sea days needed for fish/invertebrate species groups of the corresponding fish/invertebrate fleets exceeded the sea days needed for the turtle gear type, then the sea days needed for fish/invertebrate was used.
- If the number of sea days needed for turtles for the gear type exceeded the sum of the sea days needed for fish/invertebrate groups of the corresponding fish/invertebrate fleets, then the sea days needed for turtles were distributed according to the proportion of VTR sea days⁴ corresponding to fish/invertebrate fleets (Table 5; Steps 4a - 4c). The number of VTR sea days by fleet is taken from Table 3 in Wigley et al. 2015 and reflects industry activity during the July 2013 through June 2014 time period.

A total of 15,786 sea days is needed for fish/invertebrates and loggerhead turtles (COMBINED; Table 5; Step 5) during the April 2015 through March 2016 period. Of the 15,786 sea days, 13,630 sea days are needed for agency-funded fleets and 2,156 sea days are needed for industry-funded fleets (Table 5, Step 6).

Summary of Funding available for the April 2015 through March 2016 period

The funds available to the NEFSC's Northeast Fisheries Sampling Branch in fiscal year (FY) 2015 are estimated to provide support for 9,415 days and 1,850 days are carried over (i.e., bought ahead) from FY2014 funds for a total of 11,265 (9,415 + 1,850) days for the April 2015 through March 2016 time period. Based upon an observer set-aside compensation rate analysis for the Industry Funded Scallop program, there is industry funding for 2,512 days. Hence, 13,777 (11,265 + 2,512) days are available for observer coverage during April 2015 through March 2016.

Below is a summary of the 2 funding source categories: agency-funded and industry-funded. Within the agency-funded category, there are 6 sub-categories: Atlantic Coast, National Catch Share Program, National Observer Program, Northeast Fisheries Observers, Marine Mammal Protection Act, and Reducing Bycatch.

- **Agency-funded:** The funding sources for the 11,265 agency-funded sea days include: Atlantic Coast (1,152 days), Northeast Fisheries Observers (3,827 days), National Observer Program (2,310 days and 1,465 days), Reducing Bycatch (73 days), and 650 carryover/bought ahead days collectively fund the sea days for prioritization (9,477 days; Table 5, Step 7); National Catch Share Program funds support the infrastructure (data processing and training) and the FY2014 National Observer Program funding (remaining in At-Sea Monitoring [ASM] contracts) collectively fund the sea days for At-Sea Monitoring (1,100 days; Table 5, Step 7); and Marine Mammal Protection Act (MMPA; 588 days) and

⁴ The use of VTR sea days represents a refinement to the sea day allocation methods used in 2012, 2013, 2014, and those described in the 2015 SBRM Omnibus Amendment. This refinement results in the sea days needed to monitor turtles to be distributed among fish/invertebrate fleets based on industry activity. Additionally, this refinement preserves the number of TURS days within each turtle gear type group. These two features were not present in the previous method in which the numbers of day needed for fish/invertebrates were used.

FY14 carryover/bought ahead (100 days) collectively fund the sea days to monitor protected species (688 days; Table 5, Step 7).

- 688 agency-funded days are applicable to protected species⁵ only.

The 688 MMPA days are associated with trips having sampling protocols that are specific to protected species (marine mammals, sea turtles, Endangered Species Act [ESA] listed fish species) and are not applicable for non-ESA listed fish and invertebrates. Owing to the extra demands of monitoring protected species, information on finfish and shellfish is not collected on these trips. However, these days will provide observer coverage for sea turtles and ESA-listed fish species above that which is allocated.

- 10,577 (11,265 - 688) agency-funded days are applicable for all species.
 - 9,477 days are subject to the prioritization process across all fleets. The prioritization approach is described in the next section and given in Table 6.
 - 1,100 days are associated with At-Sea Monitoring and have been provisionally allocated among fleets associated with New England groundfish based on previous year industry activity. Actual allocation will be based on industry activity during April 2015 through March 2016.
 - No sea days have been set aside to support the training of new observers or as discovery days to address emerging questions of scientific and management interest as the year progresses.
- Projected costs (i.e., an estimated rate that includes fixed and variable costs for operations, training, and data processing infrastructure and at-sea costs based on realized cost in FY14): \$1227 for NEFOP days (\$712 for the costs associated with the sea days and \$515) and \$1241 for ASM days (\$711 for the sea day portion and \$530 from the infrastructure).
- **Industry-funded:** The number of industry-funded sea days available for scallop fleets is determined by taking 1 percent of the total acceptable biological catch/annual catch limit set for the year. The Industry Funded Scallop (IFS) 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. 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 observer coverage of the 12 industry-funded scallop fleets (Rows 9-12 and 31-38; Table 5).

⁵ In this document, protected species refers to marine mammals, sea turtles, and ESA-listed fish.

- Based upon the compensation rate analysis, a total of 2,512 sea days can be funded: 1,346 days for Open areas, 1,149 days for Mid-Atlantic Access Areas, 10 days for Closed Area II (CAII), and 7 days in the Nantucket Lightship Access Area (NLAA).

- The industry-funded schedule runs March through February, a 12-month period that is shifted 1 month from the NEFOP sea day schedule of April to March.
- Bulletins describing the 2015 set-aside compensation rate calculations and scallop management measures are available at:

<http://www.greateratlantic.fisheries.noaa.gov/nr/2015/April/15scalobsercomrateph1.pdf>

<http://www.greateratlantic.fisheries.noaa.gov/nr/2015/February/15scalfy2015measuresph1.pdf>

- Of the 1,346 days for the Open areas, there are 193 days for Limited Access General Category fleets (Rows 11, 35, and 36; Table 7) and 1,153 days for Limited Access fleets (Rows 12, 37, and 38; Table 7).
- Coverage of the 12 fleets depends on industry activity among these fleets during April 2015 through March 2016; the sea days represent the maximum coverage (i.e., caps).
- Projected costs: the cost to industry for at-sea portion is \$675/day for industry-funded fleets. Additional agency funds are needed for training and certification of observers and data processing.

Below is a summary of sea days based on the agency budget and the compensation rate analysis, by funding source for April 2015 through March 2016.

Funding Source	Sea Days
Agency-funded Total	11,265
Agency-funded applicable to all species (prioritized days)	9,477
Agency-funded applicable to all species (non-prioritized days)	1,100
Agency-funded applicable to protected species only (non-prioritized days)	688
Industry-funded Total applicable to all species	2,512
Total	13,777

Prioritization Trigger and Details of the Allocation of Sea Days to Fleets

Within the agency-funded fleets and prioritization-applicable funding, a funding shortfall of 4,153 (13,630 – 9,477) days is expected (Table 5). The 2015 funding shortfall triggers the SBRM prioritization approach; the prioritization approach is utilized with a portion of the agency funds.

The following describes the steps taken to allocate the 13,777 funded sea days to 41 fleets (Tables 5, 6, and 7).

Step 1. Derive the number of sea days needed for the 14 fish/invertebrate species groups (see Wigley et al. 2015, same method as Wigley et al. 2014; Table 5).

Step 2. Apply the trip filter and remove sea days from fleets that comprise 1% or less of the cumulative percentage of trips across all fleets. A total of 10,365 days is needed across 35 fleets (28 agency-funded fleets and 7 industry-funded fleets; Table 5).

Step 3. Derive the number of sea days needed for sea turtles (see Murray 2012, 2013, in review; Table 5).

Step 4. To support the penultimate prioritization approach, derive the number of sea days needed for loggerhead turtles for each of the fish/invertebrate fleets associated with the turtle gear type group (Table 5).

- a. Summarize the number of VTR sea days corresponding to each fish/invertebrate fleet (see Table 3 in Wigley et al. 2015). The VTR sea days are zero for the fish/invertebrate fleets that have been filtered out via the trip filter.
- b. Derive the percentage of VTR sea days for each fish/invertebrate fleet within a turtle gear type group. For each fish/invertebrate fleet associated with a turtle gear type, divide the VTR sea days by the sum of the VTR sea days for the gear type group.
- c. Derive the number of sea days needed for loggerhead turtles by fish/invertebrate fleet. Multiply the number of turtle sea days needed for the gear type by the percentage of VTR sea days for each fish/invertebrate fleet within the turtle gear type group.

Step 5. Derive the number of sea days needed for fish/invertebrates and turtles COMBINED; select the largest of the 2 sea days (i.e., sea days needed for the 14 fish/invertebrate species groups with the trip filter applied [Step 2] and sea days needed for loggerhead turtles [Step 4c]) within the fleet.

A total of 15,786 days is needed to achieve a 30% CV on the discards of the 15 species groups in 2015; Table 5).

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

There were 13,630 days and 2,156 days needed to achieve a 30% CV for the 15 species groups for agency-funded and industry-funded fleets, respectively (Table 5).

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

There are 9,477 agency-funded days applicable to the prioritization process (Table 5).

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

A shortfall of 4,153 days is expected for agency-funded fleets (Table 5).

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

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

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

Step 9.1. For each agency-funded fleet where sea days are needed, list the sea days needed for the 15 species groups (fish/invertebrates and loggerhead turtles) in descending order within a fleet (Table 6). Use the minimum pilot days (Table 4) as the minimum sea days needed for fleets that are not filtered out via the trip filter.

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

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

Repeat this process for the next largest difference, with the constraint that the differences are taken in penultimate order (from left to right in the matrix) within a fleet, until the cumulative reduction of sea days equals the sea day shortfall (Step 8). If the reduction in sea days using the next largest (penultimate) value is greater than the shortfall, reduce the number of sea days only enough to remove the shortfall.

The 2015 sea day shortfall is 4,153 days. The 4,647 days (red deepsea crab [RCRAB] in Row 8; Tables 4 and 6) associated with the largest sea day difference (3,916 days) between adjacent species groups is removed first (Table 6). The penultimate value in Row 8 is associated with Fluke-scup-black sea bass (731 days; Tables 4 and 6). The 1,577 days (loggerhead turtle [TURS] in Row 5; Tables 5 and 6) are associated with the next largest sea day difference (1,021 days) between adjacent species groups. Removing 1,577 days associated with TURS would remove more sea days than needed to reach the shortfall amount of

4,153 days (Table 6). Thus, only 237 of the 1,021 sea day difference between adjacent species groups (1,577 days for TURS and 566 days for squid-butterfish-mackerel [SBM]) are needed (Table 6). The penultimate value for Row 5 becomes 1,340 (1,577 – 237) days for TURS.

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

The 9,477 prioritized sea days provide observer coverage to all 28 agency-funded fleets. There are 26 fleets for which no reduction in sea days occurred and there are 2 fleets (Rows 5 and 8) for which the numbers of sea days allocated are less than the days needed to achieve a 30% CV. The prioritized sea days for Row 5 become 1,340 days and the prioritized sea days for Row 8 become 731 days (Table 6). For Row 5, all fish/invertebrate species groups have an expected CV of 30% or less; however, the CV for TURS in the MA otter trawl gear type group is expected to exceed 30%. For Row 8, the CV for the RCRAB species group is expected to exceed 30% while all other species groups within this fleet have an expected CV of 30% or less.

Step 9.5. Identify fleets that cannot be covered by NEFOP this year.

In 2015, there are no practical limitations that prevent the NEFOP from covering these fleets. The sea days in Step 9.5 equal the sea days in Step 9.4 (Table 7).

Step 10. Allocate agency-funded non-prioritized sea days: ASM and MMPA days.

There are 1,788 agency-funded days that are not applicable to the prioritization process (non-prioritized days: 1,100 ASM days and 688 MMPA days; Table 7).

The 1,100 ASM sea days will be assigned to trips via the Pre-Trip Notification System (PTNS; Palmer et al. 2013). This means that the observer coverage within each of these fleets will depend upon industry activity during the April 2015 through March 2016 period. The ASM sea days have been proportionally allocated based on previous year industry activity, and thus the allocation presented in this report should be considered provisional (Table 7).

The 688 MMPA sea days, all assumed to have limited sampling protocols, are allocated to a row designated as “MMPA coverage” and will be associated with the NE and MA gillnet fleets (Rows 23-28; Table 7).

Step 11. Allocate industry-funded days. The sea days for the industry-funded fleets are assigned to trips via the call-in system⁶. Similar to the ASM non-prioritized sea days, the sea day

⁶ For more information on the call-in system for the industry-funded scallop program, see http://www.nefsc.noaa.gov/fsb/scallop/Industry_Scallop_Call_in_Guide.pdf

coverage for industry-funded fleets will depend on industry activity during the April 2015 through March 2016 period and will be capped as described above. The 2,512 industry-funded sea days have not been allocated to individual fish/invertebrate fleets, but rather to groups of fish/invertebrate fleets that correspond to the stratification used in compensation rate analysis: Mid-Atlantic access area fleets (Rows 9, 10, 31, and 33; Table 7); Open areas fleets (Rows 11, 35 and 36 for Limited Access General Category fleets and Rows 12, 37, and 38 for Limited Access; Table 7); and New England access area fleets (Rows 32 and 34; Table 7). The allocated sea days represent the maximum coverage (i.e., caps).

Industry-funded sea days are expected to meet or exceed the SBRM required sea days for each fleet group corresponding to the stratification used in the compensation rate analysis except for New England access areas (Table 7). The 2015 sea day analyses estimated a total of 121 days needed for the New England access areas (Rows 32 and 34) for the upcoming year based on the July 2013 through June 2014 data; however, the New England access areas are closed for 2015 and fishing activity will not be allowed in these access areas after April 2015. Hence only a portion of the 121 days will be required for this group to cover 2014 compensation fishing trips. It was estimated that a total of 17 days would provide sufficient coverage between the beginning of the sea day schedule (April 2015) and the implementation of the 2015 scallop regulations.

Step 12. The sea days allocated for the April 2015 – March 2016 (TOTAL) is the sum of the prioritized days (Step 9.5), non-prioritized days (Step 10), and industry-funded days (Step 11). A total of 13,777 days is allocated across 41 fleets (Table 7).

The agency-funded fleets with an * or ** (Table 7) indicate that some or all of the observer coverage will be assigned via the PTNS or the scallop call-in program. This means that some or all of the observer coverage within each of these fleets will depend upon industry activity during the April 2015 through March 2016 period. The sea days for agency-funded fleets have been proportionally allocated based on previous year industry activity, and thus should be considered provisional. All other fleets will have sea days assigned to trips via the NEFOP sea day schedule.

Discussion

Although the trip filter removes the fleets with overall low activity from the sample size analysis, some of these fleets may have observer coverage assigned via the PTNS or the call-in program. For example, 5 of the 21 fleets that are removed by the trip filter are scallop fleets (Rows 9, 10, 12, 31, and 32) that have a call-in program such that coverage could be assigned based on industry activity. Similarly, those fleets associated with groundfish (e.g., Row 17) could be assigned observer coverage via the PTNS, depending upon industry activity. Because the sea days needed for these fleets have been excluded, the needed sea days may be slightly underestimated. However, it is important to note that these fleets have very low trip activity and the activity is expected to remain low. As a practical matter, fleets with low trip activity within a quarter or overall are very difficult to “find” unless they are part of PTNS or a call-in program. Attempts to assign observers can be inefficient since the probability of randomly finding such trips at a specific port or time period will be very low. Such fleets fall below practical detection limits.

The sample size analysis conducted by Wigley et al. (2015) derived the expected precision (CV) of the discard estimates for various species groups over a range of sample sizes for each of the species groups that were not filtered out by the importance filter (see Table 7 and Figure 3 in Wigley et al. 2015). Deriving the expected CV assumes the variance of the discard estimate is constant over a range of sample sizes (number of trips). For fish/invertebrates, the following example illustrates that although the sea days needed may be greater than the total allocated sea days, this does not imply that the expected precision for *all* fish/invertebrate species groups will exceed 30% CV. In the NE large mesh otter trawl fleet, a total of 1,390 days (Table 7, Step 12, Row 8) has been allocated for which 4,647 days (Table 7, Step 5, Row 8) are needed for a 30% CV for the 14 fish/invertebrate species groups. The expected CV for RCRA is approximately 59% and all other fish/invertebrate species groups have an expected CV of 30% or less with 1,390 days allocated to this fleet (Figure 1). For loggerhead turtles, 3,309 days are needed in Mid-Atlantic otter trawl fleets for a 30% CV. With 2,977 days allocated to Mid-Atlantic otter trawl fleets (Table 7, Step 12, Rows 5 and 6), the expected CV increases to roughly 32% (Figure 2). As IFS days will provide additional coverage for turtles in MA scallop trawl fleets, the expected CV may be slightly lower.

The NY Department of Environmental Conservation has secured funding through the Atlantic Coast Cooperative Statistical Program (ACCSP) to support observer coverage (approximately 880 days) for otter trawl, gillnet, and pot/trap fleets in the Mid-Atlantic region. These sea days will provide observer coverage for all species above that allocated in this report.

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

ATLANTIC SALMON (SAL)	<i>Salmo salar</i>
BLUEFISH (BLUE)	<i>Pomatomus saltatrix</i>
FLUKE - SCUP - BLACK SEA BASS (FSB)	
Black sea bass	<i>Centropristis striata</i>
Fluke	<i>Paralichthys dentatus</i>
Scup	<i>Stenotomus chrysops</i>
HERRING, ATLANTIC (HERR)	<i>Clupea harengus</i>
LARGE MESH GROUND FISH (GFL)	
American plaice	<i>Hippoglossoides platessoides</i>
Atlantic cod	<i>Gadus morhua</i>
Atlantic halibut	<i>Hippoglossus hippoglossus</i>
Atlantic wolffish	<i>Anarhichas lupus</i>
Haddock	<i>Melanogrammus aeglefinus</i>
Ocean pout	<i>Zoarces americanus</i>
Pollock	<i>Pollachius virens</i>
Redfish	<i>Sebastes fasciatus</i>
White hake	<i>Urophycis tenuis</i>
Windowpane flounder	<i>Scophthalmus aquosus</i>
Winter flounder	<i>Pseudopleuronectes americanus</i>
Witch flounder	<i>Glyptocephalus cynoglossus</i>
Yellowtail flounder	<i>Limanda ferruginea</i>
MONKFISH (MONK)	<i>Lophius americanus</i>
RED DEESEA CRAB (RCRAB)⁷	<i>Chaceon quinquedens</i>
SEA SCALLOP (SCAL)	<i>Placopecten magellanicus</i>
SKATE COMPLEX (SKATE)⁸	<i>Rajidae</i>
Barndoor skate	<i>Dipturus laevis</i>
Clearnose skate	<i>Raja eglanteria</i>
Little skate	<i>Leucoraja erinacea</i>
Rosette skate	<i>Leucoraja garmani</i>
Smooth skate	<i>Malacoraja senta</i>
Thorny skate	<i>Amblyraja radiata</i>
Winter skate	<i>Leucoraja ocellata</i>
SMALL MESH GROUND FISH (GFS)	
Offshore hake	<i>Merluccius albidus</i>
Red hake	<i>Urophycis chuss</i>
Silver hake	<i>Merluccius bilinearis</i>
SPINY DOGFISH (DOG)	<i>Squalus acanthias</i>
SQUID⁹ - BUTTERFISH - MACKEREL (SBM)	
Atlantic mackerel	<i>Scomber scombrus</i>
Butterfish	<i>Peprilus triacanthus</i>
Northern shortfin squid	<i>Illex illecebrosus</i>
Longfin inshore squid	<i>Doryteuthis (Amerigo) pealeii</i>
SURFCLAM - OCEAN QUAHOG (SCOQ)	
Surfclam	<i>Spisula solidissima</i>
Ocean quahog	<i>Artica islandica</i>
TILEFISH (TILE)	<i>Lopholatilus chamaeleonticeps</i>
LOGGERHEAD TURTLE (TURS)	<i>Caretta caretta</i>

⁷ Red deepsea crab was referred to as red crab in previous documents.

⁸ Skate complex comprises 7 species as well as skate, unknown.

⁹ Squid, unclassified is included in this species group. In this document, longfin inshore squid is referred to as longfin squid. Longfin inshore squid and northern shortfin squid are also known as Loligo squid and Illex squid, respectively.

Table 2. Total catch (live lb), Vessel Trip Report landings (kept; live lb), estimated discards (live lb), associated coefficient of variation (CV), and standard error of the estimated discards (SE; live lb) for 14 SBRM species groups combined, by fleet, based on July 2013 through June 2014 data. Dark shading indicates fleets not considered or with no Northeast Fisheries Observer Program trips in the annual analysis. These CVs were not used in the annual sample size analysis. Blank CV indicates either no discards or discards equals 0. "P" indicates fleets with "pilot" designation. Taken from Table 5C in Wigley et al. 2015.

Species: 14 SBRM SPECIES GROUPS COMBINED

Fleet		Access Area	Trip Category	Region	Mesh Group	Total	Kept	Discarded	CV	SE	Pilot
Row	Gear Type										
1	Longline	OPEN	all	MA	all	1,711,479	1,711,479				P
2	Longline	OPEN	all	NE	all	1,490,357	1,298,479	191,878	0.348	66,722	
3	Hand Line	OPEN	all	MA	all	296,320	296,320	0			P
4	Hand Line	OPEN	all	NE	all	1,177,906	936,874	241,032	0.496	119,447	
5	Otter Trawl	OPEN	all	MA	sm	47,393,001	31,649,299	15,743,702	0.099	1,555,892	
6	Otter Trawl	OPEN	all	MA	lg	36,769,493	13,561,150	23,208,344	0.111	2,573,438	
7	Otter Trawl	OPEN	all	NE	sm	61,106,617	54,835,765	6,270,852	0.135	848,933	
8	Otter Trawl	OPEN	all	NE	lg	105,280,035	57,234,642	48,045,393	0.069	3,338,657	
11	Scallop Trawl	OPEN	GEN	MA	all	1,966,509	996,246	970,264	0.174	168,466	
12	Scallop Trawl	OPEN	LIM	MA	all	658,754	658,754				P
13	Otter Trawl, Twin	OPEN	all	MA	all	1,260,016	1,148,765	111,251	0.000	0	P
16	Otter Trawl, Ruhle	OPEN	all	NE	sm	1,103,933	902,390	201,543	0.035	7,072	P
17	Otter Trawl, Ruhle	OPEN	all	NE	lg	119,838	72,306	47,532	0.000	0	P
18	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	3,132,468	2,412,967	719,501	0.189	135,902	
19	Shrimp Trawl	OPEN	all	MA	all	8,386	8,386				P
20	Shrimp Trawl	OPEN	all	NE	all	369,649	369,649				P
22	Floating Trap	OPEN	all	NE	all	18,352	18,352				P
23	Sink, Anchor, Drift Gillnet	OPEN	all	MA	sm	1,384,925	1,352,331	32,594	1.830	59,639	
24	Sink, Anchor, Drift Gillnet	OPEN	all	MA	lg	4,173,630	3,912,719	260,911	0.500	130,431	
25	Sink, Anchor, Drift Gillnet	OPEN	all	MA	xlg	7,708,472	6,823,553	884,919	0.196	173,070	
26	Sink, Anchor, Drift Gillnet	OPEN	all	NE	sm	376	376				P
27	Sink, Anchor, Drift Gillnet	OPEN	all	NE	lg	11,628,459	7,956,540	3,671,919	0.077	281,674	
28	Sink, Anchor, Drift Gillnet	OPEN	all	NE	xlg	17,943,981	15,175,147	2,768,834	0.080	221,403	
29	Purse Seine	OPEN	all	MA	all	0	0				P
30	Purse Seine	OPEN	all	NE	all	48,513,940	48,499,422	14,518	0.512	7,439	
31	Scallop Dredge	AA	GEN	MA	all	375,290	360,682	14,608	0.559	8,164	P
32	Scallop Dredge	AA	GEN	NE	all	468,359	449,517	18,842	0.560	10,545	
33	Scallop Dredge	AA	LIM	MA	all	17,830,225	15,570,539	2,259,686	0.246	556,073	

Table 2, continued. Total catch (live lb), Vessel Trip Report landings (kept; live lb), estimated discards (live lb), associated coefficient of variation (CV), and standard error of the estimated discards (SE; live lb) for 14 SBRM species groups combined, by fleet, based on July 2013 through June 2014 data. Dark shading indicates fleets not considered or with no Northeast Fisheries Observer Program trips in the annual analysis. These CVs were not used in the annual sample size analysis. Blank CV indicates either no discards or discards equals 0. "P" indicates fleets with "pilot" designation. Taken from Table 5C in Wigley et al. 2015.

Species: 14 SBRM SPECIES GROUPS COMBINED

Fleet						Total	Kept	Discarded	CV	SE	Pilot
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group						
34	Scallop Dredge	AA	LIM	NE	all	34,703,924	31,504,235	3,199,689	0.135	432,822	
35	Scallop Dredge	OPEN	GEN	MA	all	11,935,749	9,888,426	2,047,323	0.099	203,326	
36	Scallop Dredge	OPEN	GEN	NE	all	9,881,711	8,982,229	899,483	0.122	110,096	
37	Scallop Dredge	OPEN	LIM	MA	all	60,751,142	55,320,621	5,430,521	0.081	439,652	
38	Scallop Dredge	OPEN	LIM	NE	all	192,744,890	167,907,405	24,837,485	0.059	1,457,709	
39	Danish Seine	OPEN	all	MA	all	0	0				P
40	Mid-water Paired & Single Trawl	OPEN	all	MA	all	3,172,468	3,163,000	9,468	0.000	0	P
41	Mid-water Paired & Single Trawl	OPEN	all	NE	all	148,097,047	148,023,920	73,127	0.403	29,474	
42	Pots and Traps, Fish	OPEN	all	MA	all	478,506	366,848	111,657	0.215	23,975	P
43	Pots and Traps, Fish	OPEN	all	NE	all	319,991	319,991				P
44	Pots and Traps, Conch	OPEN	all	MA	all	5,475	3,346	2,129	0.145	309	P
45	Pots and Traps, Conch	OPEN	all	NE	all	42,794	0	42,794	0.000	0	P
46	Pots and Traps, Hagfish	OPEN	all	NE	all	0	0				P
47	Pots and Traps, Lobster	OPEN	all	MA	all	272,646	140,018	132,628	0.169	22,401	P
48	Pots and Traps, Lobster	OPEN	all	NE	all	342,744	25,205	317,539	0.990	314,458	
49	Pots and Traps, Crab	OPEN	all	MA	all	176,310	176,310				P
50	Pots and Traps, Crab	OPEN	all	NE	all	2,202,976	2,201,739	1,237	0.000	0	P
51	Beam Trawl	OPEN	all	MA	all	675,527	675,527				P
53	Dredge, Other	OPEN	all	MA	all	0	0				P
54	Ocean Quahog/Surfclam Dredge	OPEN	all	MA	all	256,367,297	256,367,297				P
55	Ocean Quahog/Surfclam Dredge	OPEN	all	NE	all	215,812,072	215,812,072				P
56	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	267,724	202,022	65,702	0.044	2,911	
Confidential fleets						271,892	271,892				
Other fleets						2,284,907	2,284,907				
TOTAL						1,314,698,562	1,171,849,660	142,848,902	0.034	4,911,669	

Table 3. The most recent average annual estimates of sea turtle interactions and their associated coefficient of variation (CV) in U.S. Mid-Atlantic commercial fisheries.

Fishery	Estimate	CV	Years Included	Species	Reference
Bottom trawl, for fish and scallops	231	0.13	01 Jan 2009-2013	Loggerhead	Murray (in review)
Sea Scallop Dredge	95	0.18	26 Sep 2006-2008	Loggerhead	Murray 2011
Sea Scallop Dredge	125	0.15	26 Sep 2006-2008	Hard-shelled	Murray 2011
Sink Gillnet	89	0.26	01 Jan 2007-2001	Loggerhead	Murray 2013
Sink Gillnet	95	0.21	01 Jan 2007-2011	Hard-shelled	Murray 2013

Table 4. The number of sea days needed to achieve a 30% coefficient of variation of the discard estimate for each of the 14 fish and invertebrate species groups, the number of pilot sea days, the number of minimum pilot sea days, and the maximum number of sea days needed for each fleet (2015 Sea Days Needed) for fish and invertebrate species groups based on July 2013 through June 2014 data. Bold red font indicates basis for fleet sea days. “P” indicates fleets with “pilot” designation. Species group abbreviations are given in Table 1. *Taken from Table 6 in Wigley et al. 2015.*

Row	Fleet Gear Type	Access Area	Trip Category	Region	Mesh Group	BLUE	HERR	SAL	RCRAB	SCAL	SBM	MONK	GFL	GFS	SKATE	DOG	FSB	SCOQ	TILE	Pilot Days	Min Pilot Days	2015 Sea Days Needed	Pilot	
1	Longline	OPEN	all	MA	all	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	P	
2	Longline	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	14	14		
3	Hand Line	OPEN	all	MA	all	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	P	
4	Hand Line	OPEN	all	NE	all	0	0	0	0	0	0	0	48	0	0	0	0	0	0	0	51	13	48	
5	Otter Trawl	OPEN	all	MA	sm	0	0	0	0	0	556	0	336	531	294	402	493	0	0	176	32	556		
6	Otter Trawl	OPEN	all	MA	lg	0	0	0	0	0	0	744	72	0	89	220	210	0	0	183	29	744		
7	Otter Trawl	OPEN	all	NE	sm	0	0	0	0	0	1,311	0	313	460	0	571	720	0	0	186	34	1,311		
8	Otter Trawl	OPEN	all	NE	lg	0	0	0	4,647	0	0	228	349	231	316	192	731	0	0	376	35	4,647		
9	Scallop Trawl	AA	GEN	MA	all	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	P	
10	Scallop Trawl	AA	LIM	MA	all	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	P	
11	Scallop Trawl	OPEN	GEN	MA	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	23		
12	Scallop Trawl	OPEN	LIM	MA	all	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	72	P	
13	Otter Trawl, Twin	OPEN	all	MA	all	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	P	
14	Otter Trawl, Twin	OPEN	all	NE	all	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	85	P	
15	Otter Trawl, Ruhle	OPEN	all	MA	lg	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	P	
16	Otter Trawl, Ruhle	OPEN	all	NE	sm	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	P	
17	Otter Trawl, Ruhle	OPEN	all	NE	lg	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	P	
18	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	0	0	0	0	0	0	0	0	0	0	302	0	0	0	94	94	302		
19	Shrimp Trawl	OPEN	all	MA	all	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	P	
20	Shrimp Trawl	OPEN	all	NE	all	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	P	
21	Floating Trap	OPEN	all	MA	all	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	P	
22	Floating Trap	OPEN	all	NE	all	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	P	
23	Sink, Anchor, Drift Gillnet	OPEN	all	MA	sm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	12	12		
24	Sink, Anchor, Drift Gillnet	OPEN	all	MA	lg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	13	13		
25	Sink, Anchor, Drift Gillnet	OPEN	all	MA	xl	0	0	0	0	0	0	122	0	0	0	0	0	0	0	51	14	122		
26	Sink, Anchor, Drift Gillnet	OPEN	all	NE	sm	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	P	
27	Sink, Anchor, Drift Gillnet	OPEN	all	NE	lg	0	0	0	0	0	0	0	0	0	0	103	0	0	0	108	19	103		
28	Sink, Anchor, Drift Gillnet	OPEN	all	NE	xl	0	0	0	0	0	0	152	0	0	73	240	0	0	0	87	19	240		
29	Purse Seine	OPEN	all	MA	all	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	P	
30	Purse Seine	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34	31	31		
31	Scallop Dredge	AA	GEN	MA	all	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	P	
32	Scallop Dredge	AA	GEN	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	31	31		
33	Scallop Dredge	AA	LIM	MA	all	0	0	0	0	0	0	153	0	0	0	0	0	0	0	90	90	153		
34	Scallop Dredge	AA	LIM	NE	all	0	0	0	0	0	0	65	0	0	121	0	0	0	0	97	94	121		
35	Scallop Dredge	OPEN	GEN	MA	all	0	0	0	0	0	0	0	0	0	28	0	0	0	0	76	21	28		
36	Scallop Dredge	OPEN	GEN	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	16	16		
37	Scallop Dredge	OPEN	LIM	MA	all	0	0	0	0	0	0	123	0	0	51	0	0	0	0	118	105	123		
38	Scallop Dredge	OPEN	LIM	NE	all	0	0	0	0	0	0	176	155	630	84	0	207	0	0	216	113	630		
39	Danish Seine	OPEN	all	MA	all	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	P	
40	Mid-water Paired & Single Trawl	OPEN	all	MA	all	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	P	
41	Mid-water Paired & Single Trawl	OPEN	all	NE	all	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	39	39		

Table 4 continued. The number of sea days needed to achieve a 30% coefficient of variation of the discard estimate for each of the 14 fish and invertebrate species groups, the number of pilot sea days, the number of minimum pilot sea days, and the maximum number of sea days needed for each fleet (2015 Sea Days Needed) for fish and invertebrate species groups based on July 2013 through June 2014 data. Bold red font indicates basis for fleet sea days. “P” indicates fleets with “pilot” designation. Species group abbreviations are given in Table 1. Taken from Table 6 in Wigley et al. 2015.

Row	Fleet Gear Type	Access Area	Trip Category	Region	Mesh Group	BLUE	HERR	SAL	RCRAB	SCAL	SBM	MONK	GFL	GFS	SKATE	DOG	FSB	SCOQ	TILE	Pilot Days	Min Pilot Days	2015 Sea Days Needed	Pilot	
42	Pots and Traps, Fish	OPEN	all	MA	all	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	13	22	P
43	Pots and Traps, Fish	OPEN	all	NE	all	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	30	42	P
44	Pots and Traps, Conch	OPEN	all	MA	all	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	15	28	P
45	Pots and Traps, Conch	OPEN	all	NE	all	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	9	22	P
46	Pots and Traps, Hagfish	OPEN	all	NE	all	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	P
47	Pots and Traps, Lobster	OPEN	all	MA	all	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	17	47	P
48	Pots and Traps, Lobster	OPEN	all	NE	all	0	0	0	0	0	0	0	572	0	0	0	0	0	0	0	447	18	572	
49	Pots and Traps, Crab	OPEN	all	MA	all	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	P
50	Pots and Traps, Crab	OPEN	all	NE	all	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	P
51	Beam Trawl	OPEN	all	MA	all	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	P
52	Beam Trawl	OPEN	all	NE	all	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	P
53	Dredge, Other	OPEN	all	MA	all	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	11	P
54	Ocean Quahog/Surfclam Dredge	OPEN	all	MA	all	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	24	75	P
55	Ocean Quahog/Surfclam Dredge	OPEN	all	NE	all	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	14	65	P
56	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	25	25	
					Totals	1,300	1,300	1,300	5,947	1,300	3,167	3,063	3,145	3,152	2,356	3,330	3,661	1,300	1,300	3,998	1,987	11,204		

Table 5. The number of sea days needed to monitor fish/invertebrates (FISH), loggerhead turtles (TURS), combined species groups (COMBINED) by fleet (Steps 1 through 6), and the number of funded sea days for April 2015 through March 2016 (Step 7) and the differences between needed and funded days (Step 8).

Fleet						Step 1	Step 2	Step 3	Step 4a	Step 4b	Step 4c	Step 5		
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2015 Sea Days Needed FISH	2015 Sea Days Needed FISH FILTERED	2015 Sea Days Needed for TURS	Vessel Trip Report Sea Days	% Vessel Trip Report Sea Days	TURS Sea Days by FISH fleet	2015 Sea Days Needed COMBINED		
1	Longline	OPEN	all	MA	all	85	85		1,303			85		
2	Longline	OPEN	all	NE	all	14	14		540			14		
3	Hand Line	OPEN	all	MA	all	70	70		3,395			70		
4	Hand Line	OPEN	all	NE	all	48	48		2,385			48		
5	Otter Trawl	OPEN	all	MA	sm	556	556		8,824	0.477	1,577	1,577		
6	Otter Trawl	OPEN	all	MA	lg	744	744	3,309	9,156	0.495	1,636	1,636		
7	Otter Trawl	OPEN	all	NE	sm	1311	1,311		9,318			1,311		
8	Otter Trawl	OPEN	all	NE	lg	4647	4,647		18,811			4,647		
9	Scallop Trawl	AA	GEN	MA	all	6	0		0	0.000	0	0		
10	Scallop Trawl	AA	LIM	MA	all	42	0		0	0.000	0	0		
11	Scallop Trawl	OPEN	GEN	MA	all	23	23		535	0.029	96	96		
12	Scallop Trawl	OPEN	LIM	MA	all	72	0		0	0.000	0	0		
13	Otter Trawl , Twin	OPEN	all	MA	all	60	0		0			0		
14	Otter Trawl , Twin	OPEN	all	NE	all	85	0		0			0		
15	Otter Trawl, Ruhle	OPEN	all	MA	lg	27	0		0	0.000	0	0		
16	Otter Trawl, Ruhle	OPEN	all	NE	sm	48	0		0			0		
17	Otter Trawl, Ruhle	OPEN	all	NE	lg	68	0		0			0		
18	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	302	302		990			302		
19	Shrimp Trawl	OPEN	all	MA	all	65	0		0			0		
20	Shrimp Trawl	OPEN	all	NE	all	9	9		135			9		
21	Floating Trap	OPEN	all	MA	all	9	0		0			0		
22	Floating Trap	OPEN	all	NE	all	21	0		0			0		
23	Sink, Anchor, Drift Gillnet	OPEN	all	MA	sm	12	12		1,994	0.302	784	784		
24	Sink, Anchor, Drift Gillnet	OPEN	all	MA	lg	13	13	2,593	2,120	0.322	834	834		
25	Sink, Anchor, Drift Gillnet	OPEN	all	MA	xl	122	122		2,478	0.376	975	975		
26	Sink, Anchor, Drift Gillnet	OPEN	all	NE	sm	9	0		0			0		
27	Sink, Anchor, Drift Gillnet	OPEN	all	NE	lg	103	103		5,391			103		
28	Sink, Anchor, Drift Gillnet	OPEN	all	NE	xl	240	240		4,366			240		
29	Purse Seine	OPEN	all	MA	all	6	6		231			6		
30	Purse Seine	OPEN	all	NE	all	31	31		618			31		
31	Scallop Dredge	AA	GEN	MA	all	27	0		0	0.000	0	0		
32	Scallop Dredge	AA	GEN	NE	all	31	0		0			0		
33	Scallop Dredge	AA	LIM	MA	all	153	153	1,293	1,580	0.167	216	216		
34	Scallop Dredge	AA	LIM	NE	all	121	121		2,579			121		
35	Scallop Dredge	OPEN	GEN	MA	all	28	28		3,816	0.404	522	522		
36	Scallop Dredge	OPEN	GEN	NE	all	16	16		4,662			16		
37	Scallop Dredge	OPEN	LIM	MA	all	123	123		4,053	0.429	555	555		
38	Scallop Dredge	OPEN	LIM	NE	all	630	630		10,301			630		
39	Danish Seine	OPEN	all	MA	all	6	0		0			0		
40	Mid-water Paired & Single Trawl	OPEN	all	MA	all	32	0		0			0		
41	Mid-water Paired & Single Trawl	OPEN	all	NE	all	39	39		1,426			39		
42	Pots and Traps, Fish	OPEN	all	MA	all	22	22		1,005			22		
43	Pots and Traps, Fish	OPEN	all	NE	all	42	42		956			42		
44	Pots and Traps, Conch	OPEN	all	MA	all	28	28		1,341			28		
45	Pots and Traps, Conch	OPEN	all	NE	all	22	22		1,122			22		
46	Pots and Traps, Hagfish	OPEN	all	NE	all	83	0		0			0		
47	Pots and Traps, Lobster	OPEN	all	MA	all	47	47		2,270			47		
48	Pots and Traps, Lobster	OPEN	all	NE	all	572	572		34,395			572		
49	Pots and Traps, Crab	OPEN	all	MA	all	29	0		0			0		
50	Pots and Traps, Crab	OPEN	all	NE	all	83	0		0			0		
51	Beam Trawl	OPEN	all	MA	all	35	35		324			35		
52	Beam Trawl	OPEN	all	NE	all	11	0		0			0		
53	Dredge, Other	OPEN	all	MA	all	11	11		308			11		
54	Ocean Quahog/Surflam Dredge	OPEN	all	MA	all	75	75		3,735			75		
55	Ocean Quahog/Surflam Dredge	OPEN	all	NE	all	65	65		3,230			65		
56	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	25	0		0			0		
Total						11,204	10,365	7,195	149,693			15,786		
Step 6		Agency Fleets (Sea Days Needed)					9,932	9,271						13,630
		Industry Fleets (Sea Days Needed)					1,272	1,094						2,156
Step 7		Agency Fleets (Sea Days Funded)					Prioritized						9,477	
		Agency Fleets (Sea Days Funded)					Non-prioritized (ASM)						1,100	
		Agency Fleets (Sea Days Funded)					Non-prioritized (MMPA)						688	
		Industry Fleets (Sea Days Funded)											2,512	
Step 8		Agency Fleet Difference					SHORTFALL						-4,153	
		Industry Fleet Difference					SURPLUS						356	
Turtle Gear Types		MA Trawl					1,470	1,323	3,309	18,515			3,309	
		MA Gillnet					147	147	2,593	6,592	2,593		2,593	
		MA Dredge					331	304	1,293	9,449	1,293		1,293	

KEY: Agency funded fleets Industry funded fleets

Table 7. The number of sea days needed to monitor the combined species groups (COMBINED; Step 5), prioritized days (Step 9.5), non-prioritized days (At-Sea Monitoring [ASM] and protected species [MMPA]; Step 10), industry-funded days (Step 11), and the 2015 observer sea days allocated for April 2015 through March 2016 (Step 12), by fleet. Note: * indicates all coverage is dependent on industry activity; ** indicates some coverage is dependent on industry activity; *** indicates coverage for protected species bycatch.

Fleet						Step 5	Step 9.5	Step 10	Step 11	Step 12	
Row	Gear Type	Access Area	Trip Cat.	Region	Mesh	2015 Sea Days Needed COMBINED	2015 Sea Days PRIORITIZED (Penultimate)	2015 Sea Days non-prioritized (ASM, MMPA)	2015 Industry-funded Sea Days	Sea Days Allocated for April 2015 - March 2016 (TOTAL)	Comments
1	Longline	OPEN	all	MA	all	85	85	0		85	Fish stock assessment support
2	Longline	OPEN	all	NE	all	14	14	29		43	Fish stock assessment support *
3	Hand Line	OPEN	all	MA	all	70	70	1		71	Fish stock assessment support **
4	Hand Line	OPEN	all	NE	all	48	48	17		65	Fish stock assessment support **
5	Otter Trawl	OPEN	all	MA	sm	1,577	1,340	0		1,340	Fish stock assessment and turtle bycatch support
6	Otter Trawl	OPEN	all	MA	lg	1,636	1,636	1		1,637	Fish stock assessment and turtle bycatch support **
7	Otter Trawl	OPEN	all	NE	sm	1,311	1,311	1		1,312	Fish stock assessment support **
8	Otter Trawl	OPEN	all	NE	lg	4,647	731	659		1,390	Fish stock assessment support **
9	Scallop Trawl	AA	GEN	MA	all	0					Industry funded* (see Row 33)
10	Scallop Trawl	AA	LIM	MA	all	0					Industry funded* (see Row 33)
11	Scallop Trawl	OPEN	GEN	MA	all	96					Industry funded* (see Row 36)
12	Scallop Trawl	OPEN	LIM	MA	all	0					Industry funded* (see Row 38)
13	Otter Trawl , Twin	OPEN	all	MA	all	0	0	0		0	
14	Otter Trawl , Twin	OPEN	all	NE	all	0	0	0		0	
15	Otter Trawl, Ruhle	OPEN	all	MA	lg	0	0	0		0	
16	Otter Trawl, Ruhle	OPEN	all	NE	sm	0	0	0		0	
17	Otter Trawl, Ruhle	OPEN	all	NE	lg	0	0	4		4	Fish stock assessment support *
18	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	302	302	0		302	Fish stock assessment support*
19	Shrimp Trawl	OPEN	all	MA	all	0	0	0		0	
20	Shrimp Trawl	OPEN	all	NE	all	9	9	0		9	Fish stock assessment support
21	Floating Trap	OPEN	all	MA	all	0	0	0		0	
22	Floating Trap	OPEN	all	NE	all	0	0	0		0	
23	Sink, Anchor, Drift Gillnet	OPEN	all	MA	sm	784	784	0		784	Fish stock assessment and turtle bycatch support
24	Sink, Anchor, Drift Gillnet	OPEN	all	MA	lg	834	834	0		834	Fish stock assessment and turtle bycatch support
25	Sink, Anchor, Drift Gillnet	OPEN	all	MA	xlg	975	975	0		975	Fish stock assessment support *
26	Sink, Anchor, Drift Gillnet	OPEN	all	NE	sm	0	0	0		0	
27	Sink, Anchor, Drift Gillnet	OPEN	all	NE	lg	103	103	237		340	Fish stock assessment support **
28	Sink, Anchor, Drift Gillnet	OPEN	all	NE	xlg	240	240	151		391	Fish stock assessment support**
29	Purse Seine	OPEN	all	MA	all	6	6	0		6	Fish stock assessment support
30	Purse Seine	OPEN	all	NE	all	31	31	0		31	Fish stock assessment support
31	Scallop Dredge	AA	GEN	MA	all	0					Industry funded* (see Row 33)
32	Scallop Dredge	AA	GEN	NE	all	0					Industry funded* (see Row 34)
33	Scallop Dredge	AA	LIM	MA	all	216			1,149	1,149	Industry funded* (Rows 9, 10, 31, & 33)
34	Scallop Dredge	AA	LIM	NE	all	121			17	17	Industry funded* (Rows 32 & 34)
35	Scallop Dredge	OPEN	GEN	MA	all	522					Industry funded* (see Row 36)
36	Scallop Dredge	OPEN	GEN	NE	all	16			193	193	Industry funded* (Rows 11, 35, & 36)
37	Scallop Dredge	OPEN	LIM	MA	all	555					Industry funded* (see Row 38)
38	Scallop Dredge	OPEN	LIM	NE	all	630			1,153	1,153	Industry funded* (Rows 12, 37, & 38)
39	Danish Seine	OPEN	all	MA	all	0	0	0		0	
40	Mid-water Paired & Single Trawl	OPEN	all	MA	all	0	0	0		0	
41	Mid-water Paired & Single Trawl	OPEN	all	NE	all	39	39	0		39	Fish stock assessment support
42	Pots and Traps, Fish	OPEN	all	MA	all	22	22	0		22	Fish stock assessment support
43	Pots and Traps, Fish	OPEN	all	NE	all	42	42	0		42	Fish stock assessment support
44	Pots and Traps, Conch	OPEN	all	MA	all	28	28	0		28	Fish stock assessment support
45	Pots and Traps, Conch	OPEN	all	NE	all	22	22	0		22	Fish stock assessment support
46	Pots and Traps, Hagfish	OPEN	all	NE	all	0	0	0		0	
47	Pots and Traps, Lobster	OPEN	all	MA	all	47	47	0		47	Fish stock assessment support
48	Pots and Traps, Lobster	OPEN	all	NE	all	572	572	0		572	Fish stock assessment support
49	Pots and Traps, Crab	OPEN	all	MA	all	0	0	0		0	
50	Pots and Traps, Crab	OPEN	all	NE	all	0	0	0		0	
51	Beam Trawl	OPEN	all	MA	all	35	35	0		35	Fish stock assessment support
52	Beam Trawl	OPEN	all	NE	all	0	0	0		0	
53	Dredge, Other	OPEN	all	MA	all	11	11	0		11	Fish stock assessment support
54	Ocean Quahog/Surflam Dredge	OPEN	all	MA	all	75	75	0		75	Fish stock assessment support
55	Ocean Quahog/Surflam Dredge	OPEN	all	NE	all	65	65	0		65	Fish stock assessment support
56	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	0	0	0		0	
MMPA coverage							688			688	Coverage associated with Rows 23-28***
Total						15,786	9,477	1,788	2,512	13,777	

Step 6	Agency Fleets (Sea Days Needed)	13,630	
	Industry Fleets (Sea Days Needed)	2,156	
Step 7	Agency Fleets (Sea Days Funded)	9,477	Prioritized days
	Agency Fleets (Sea Days Funded)	1,100	Non-prioritized days (ASM)
	Agency Fleets (Sea Days Funded)	688	Non-prioritized days (MMPA)
	Industry Fleets (Sea Days Funded)	2,512	Industry-funded scallop days
Step 8	Agency Fleet Difference	-4,153	
	Industry Fleet Difference	356	
Turtle Gear Types		MA Trawl	3,309
		MA Gillnet	2,593
		MA Dredge	1,293
KEY: Agency funded fleets		Industry funded fleets	
Fleets with reduction in sea days			

Appendix Table 1. Stratification abbreviations used for 2015 fleets.

Abbreviation	Definition
MA	Mid-Atlantic ports (CT and southward)
NE	New England ports (RI and northward)
sm	Small mesh (less than 5.50 in)
lg	Large mesh (mesh from 5.50 to 7.99 in for gillnet; 5.50 in and greater for otter trawl)
xlg	Extra large mesh (8 in and greater)
LIM	Limited access category
GEN	General category
OPEN	Non-access area
AA	Access area

Appendix Table 2. The number of Vessel Trip Reports (VTR) trips, by fleet and calendar quarter (Q) during July 2013 through June 2014. "P" indicates fleets with "pilot" designation. The percentage and cumulative percentage for each fleet, when fleets are ranked from smallest to largest, are also presented. The shaded cells represent the fleets containing the lowest cumulative 1% of all trips. Note: the total number of VTR trips in MA shrimp trawl fleet (Row 19) was adjusted from 405 trips to 12 trips before the trip filter was applied.

Fleet						VTR TRIPS						VTR TRIPS					
Row	Gear Type	Access Area	Trip Category	Region	Mesh Group	Q3	Q4	Q1	Q2	TOTAL	Pilot	Row	VTR Trips	% of Trips	VTR TRIPS Cum %	Row	VTR TRIPS Cum %
1	Longline	OPEN	all	MA	all	62	26	37	69	194	P	10	3	<0.1%	0.0%	1	1.5%
2	Longline	OPEN	all	NE	all	203	160	56	73	492		26	5	<0.1%	0.0%	2	5.1%
3	Hand Line	OPEN	all	MA	all	1,562	722	70	754	3,108	P	56	6	<0.1%	0.0%	3	38.4%
4	Hand Line	OPEN	all	NE	all	1,377	377	6	435	2,195		15	8	<0.1%	0.0%	4	25.3%
5	Otter Trawl	OPEN	all	MA	sm	1,472	900	394	1,073	3,839		17	9	<0.1%	0.0%	5	55.9%
6	Otter Trawl	OPEN	all	MA	lg	1,625	733	810	1,015	4,183		22	10	<0.1%	0.0%	6	60.9%
7	Otter Trawl	OPEN	all	NE	sm	1,386	745	420	1,037	3,588		19	12	<0.1%	0.1%	7	42.7%
8	Otter Trawl	OPEN	all	NE	lg	2,127	1,523	1,348	1,667	6,665		9	13	<0.1%	0.1%	8	68.8%
9	Scallop Trawl	AA	GEN	MA	all	.	.	.	13	13	P	40	13	<0.1%	0.1%	9	0.1%
10	Scallop Trawl	AA	LIM	MA	all	.	1	2	.	3	P	16	18	<0.1%	0.1%	10	0.0%
11	Scallop Trawl	OPEN	GEN	MA	all	119	20	6	134	279		14	19	<0.1%	0.1%	11	2.4%
12	Scallop Trawl	OPEN	LIM	MA	all	10	4	5	6	25	P	12	25	<0.1%	0.2%	12	0.2%
13	Otter Trawl, Twin	OPEN	all	MA	all	2	9	9	29	49	P	46	47	0.1%	0.2%	13	0.3%
14	Otter Trawl, Twin	OPEN	all	NE	all	5	6	6	2	19	P	52	47	0.1%	0.3%	14	0.1%
15	Otter Trawl, Ruhle	OPEN	all	MA	lg	6	.	2	.	8	P	13	49	0.1%	0.3%	15	0.0%
16	Otter Trawl, Ruhle	OPEN	all	NE	sm	1	.	14	3	18	P	49	54	0.1%	0.4%	16	0.1%
17	Otter Trawl, Ruhle	OPEN	all	NE	lg	2	.	1	6	9	P	31	67	0.1%	0.5%	17	0.0%
18	Otter Trawl, Haddock Separator	OPEN	all	NE	lg	14	25	12	73	124		32	71	0.1%	0.6%	18	1.2%
19	Shrimp Trawl	OPEN	all	MA	all	249	152	4	.	405	P	50	81	0.1%	0.7%	19	0.1%
20	Shrimp Trawl	OPEN	all	NE	all	78	4	.	49	131	P	21	85	0.1%	0.8%	20	1.3%
21	Floating Trap	OPEN	all	MA	all	42	5	.	38	85	P	39	85	0.1%	0.9%	21	0.8%
22	Floating Trap	OPEN	all	NE	all	9	.	.	1	10	P	51	114	0.1%	1.0%	22	0.0%
23	Sink, Anchor, Drift Gillnet	OPEN	all	MA	sm	663	452	363	460	1,938		18	124	0.1%	1.2%	23	17.8%
24	Sink, Anchor, Drift Gillnet	OPEN	all	MA	lg	534	720	308	453	2,015		20	131	0.2%	1.3%	24	20.2%
25	Sink, Anchor, Drift Gillnet	OPEN	all	MA	xl	98	714	244	1,064	2,120		1	194	0.2%	1.5%	25	22.7%
26	Sink, Anchor, Drift Gillnet	OPEN	all	NE	sm	1	3	.	1	5	P	33	200	0.2%	1.8%	26	0.0%
27	Sink, Anchor, Drift Gillnet	OPEN	all	NE	lg	1,546	990	257	828	3,621		29	229	0.3%	2.0%	27	51.3%
28	Sink, Anchor, Drift Gillnet	OPEN	all	NE	xl	1,194	556	252	931	2,933		11	279	0.3%	2.4%	28	34.7%
29	Purse Seine	OPEN	all	MA	all	105	.	.	124	229	P	53	288	0.3%	2.7%	29	2.0%
30	Purse Seine	OPEN	all	NE	all	218	39	2	37	296		30	296	0.4%	3.1%	30	3.1%
31	Scallop Dredge	AA	GEN	MA	all	9	13	8	37	67	P	34	328	0.4%	3.5%	31	0.5%
32	Scallop Dredge	AA	GEN	NE	all	59	6	2	4	71		41	439	0.5%	4.0%	32	0.6%
33	Scallop Dredge	AA	LIM	MA	all	92	25	23	60	200		37	449	0.5%	4.5%	33	1.8%
34	Scallop Dredge	AA	LIM	NE	all	168	83	18	59	328		2	492	0.6%	5.1%	34	3.5%
35	Scallop Dredge	OPEN	GEN	MA	all	703	391	349	783	2,226		43	923	1.1%	6.2%	35	28.0%
36	Scallop Dredge	OPEN	GEN	NE	all	866	669	1,090	972	3,597		42	971	1.2%	7.4%	36	47.0%
37	Scallop Dredge	OPEN	LIM	MA	all	115	54	59	221	449		38	1,043	1.2%	8.6%	37	4.5%
38	Scallop Dredge	OPEN	LIM	NE	all	353	93	171	426	1,043		44	1,107	1.3%	9.9%	38	8.6%
39	Danish Seine	OPEN	all	MA	all	24	.	.	61	85	P	45	1,119	1.3%	11.3%	39	0.9%
40	Mid-water Paired & Single Trawl	OPEN	all	MA	all	1	.	12	.	13	P	47	1,692	2.0%	13.3%	40	0.1%
41	Mid-water Paired & Single Trawl	OPEN	all	NE	all	127	112	140	60	439		54	1,824	2.2%	15.5%	41	4.0%
42	Pots and Traps, Fish	OPEN	all	MA	all	387	253	61	270	971	P	23	1,938	2.3%	17.8%	42	7.4%
43	Pots and Traps, Fish	OPEN	all	NE	all	707	112	1	103	923	P	24	2,015	2.4%	20.2%	43	6.2%
44	Pots and Traps, Conch	OPEN	all	MA	all	225	528	96	258	1,107	P	25	2,120	2.5%	22.7%	44	9.9%
45	Pots and Traps, Conch	OPEN	all	NE	all	401	362	.	356	1,119	P	4	2,195	2.6%	25.3%	45	11.3%
46	Pots and Traps, Hagfish	OPEN	all	NE	all	17	14	4	12	47	P	35	2,226	2.7%	28.0%	46	0.2%
47	Pots and Traps, Lobster	OPEN	all	MA	all	800	398	93	401	1,692	P	55	2,726	3.2%	31.2%	47	13.3%
48	Pots and Traps, Lobster	OPEN	all	NE	all	11,982	7,823	1,773	4,590	26,168		28	2,933	3.5%	34.7%	48	100.0%
49	Pots and Traps, Crab	OPEN	all	MA	all	10	5	6	33	54	P	3	3,108	3.7%	38.4%	49	0.4%
50	Pots and Traps, Crab	OPEN	all	NE	all	14	17	27	23	81	P	7	3,588	4.3%	42.7%	50	0.7%
51	Beam Trawl	OPEN	all	MA	all	36	28	11	39	114	P	36	3,597	4.3%	47.0%	51	1.0%
52	Beam Trawl	OPEN	all	NE	all	30	5	.	12	47	P	27	3,621	4.3%	51.3%	52	0.3%
53	Dredge, Other	OPEN	all	MA	all	.	41	183	64	288	P	5	3,839	4.6%	55.9%	53	2.7%
54	Ocean Quahog/Surflclam Dredge	OPEN	all	MA	all	506	365	454	499	1,824	P	6	4,183	5.0%	60.9%	54	15.5%
55	Ocean Quahog/Surflclam Dredge	OPEN	all	NE	all	823	571	563	769	2,726	P	8	6,665	7.9%	68.8%	55	31.2%
56	Otter Trawl, Haddock Separator	OPEN	all	NE	sm	.	.	.	6	6		48	26,168	31.2%	100.0%	56	0.0%
Total						33,165	20,854	9,772	20,493	84,284		83,891					

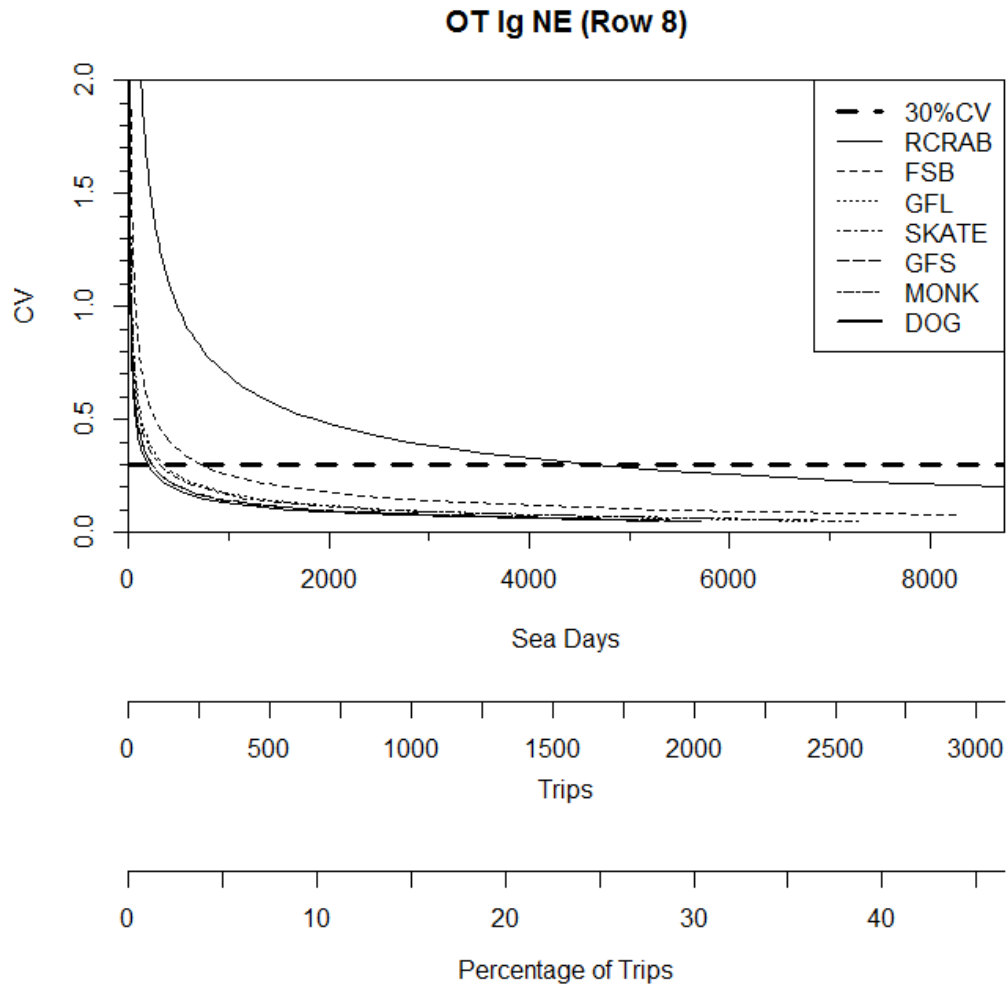


Figure 1. Results from the 2015 sample size analysis conducted for the New England large mesh otter trawl fleet (Row 8). The curves represent the relationship between the coefficient of variance (CV) and the sample size (sea days, trips, and percent of trips) for each of the species groups that were not filtered out. The horizontal dashed line is the 30% CV. For species group abbreviations, see Table 1. Taken from Figure 3 in Wigley *et al.* 2015.

Estimated Turtle Monitoring Needs for Mid-Atlantic Trawl Trips

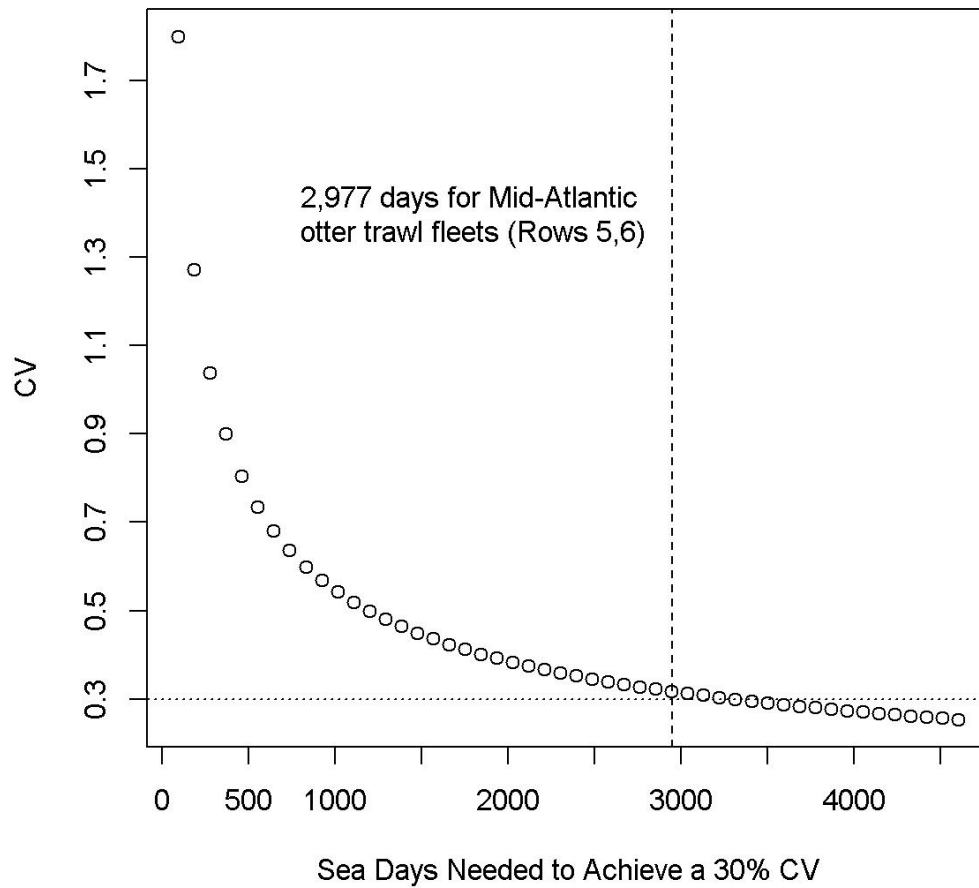


Figure 2. Expected CVs for estimates of turtle interactions in Mid-Atlantic otter trawl fleets under the observer sea day allocation for 2015. Vertical dashed line indicates the number of sea day needs for fish/invertebrates and turtles combined.