

“This information is distributed solely for the purpose of predissemination peer review. It has not been formally disseminated by NOAA. It does not represent any final agency determination or policy.”

**A Brief Description of the Discard Estimation for the National Bycatch Report**

by

S.E. Wigley, M.C. Palmer, J. Blaylock and P.J. Rago

**Working Paper in support of Terms of Reference B: Commercial Discards**

Groundfish Assessment Review Meeting  
GARM Data Review Meeting  
Woods Hole, MA

October 29 – November 2, 2007

## Preamble

This GARM working paper is in support of Terms of Reference B: Commercial Discards. This working paper illustrates the use of the combined ratio method to estimate discards as well as a validation of the method and the underlying data.

## Introduction

A National Bycatch Report is being prepared by NOAA Fisheries to summarize 2005 discard estimates and their associated precision (coefficients of variation, or CV) for federally managed and Marine Mammal Protection Act (MMPA) species by fisheries for all regions in the United States. This document briefly describes the methods used to estimate fish and shellfish discards in the Northeast Region for the National Bycatch Report. We examined 33 species and 77 fleets (Tables 1 and 2). Stock components were not considered in the analyses. Only fleets for which discard estimates were derived will be included in the National Bycatch Report.

The discard estimation used a broad stratification approach to encompass all species in the study and used a combined ratio method using a discard-to-kept weight ratio. The discard estimates reported here may not necessarily correspond directly with the discard estimates derived for individual stock assessments due to differences in stratification and methods. It is expected, however, that estimates would be in the same order of magnitude.

## Data sources

### Northeast Fisheries Observer Program Data

The Northeast Fisheries Observer Program (NEFOP) data were used to derive discard ratios. We used observed hauls from trips in 2005 for which a ‘complete’ sampling protocol was employed in 2005. Training trips, aborted trips and hauls with no catch were eliminated from the data set. Species haul weights with discard reason ‘039’ (previously discarded) were also excluded. Conversion factors were applied to convert dressed weight to live weight. NEFOP program codes were used to assign NEFOP trips to fleet sectors.

NEFOP program code	Fleet sector
130	US/CAN Resource Sharing area
140	Haddock longline HOOK sector
150	B-day
201-204	Scallop access areas
000	Open area

### Vessel Trip Report Data (VTR)

Because Dealer data do not contain mesh size and area fished information, these Dealer data could not be used to expand discard ratios by fleet. The Vessel Trip Report (VTR) data were

used as a surrogate for Dealer data and were used to expand the NEFOP discard ratios to total discards. For this analysis, 2005 commercial VTR trips [excluding NY state (non-federal) vessels] were used. Conversion factors were applied to convert various units of measure to pounds and all weight to live weight.

#### Clam Logbook and Dealer data source = '08'

The clam fishery has a separate logbook system from the VTR logbook. The 2005 commercial clam logbook data were used to augment the 2005 VTR data for the clam dredge fishery.

#### Days-At-Sea Data

The 2005 Days-At-Sea (DAS) data were used to classify the VTR trips to a fishery sector. It is assumed all vessels participating in a Special Area Program are required to report via Days-At-Sea Call-In system or through Vessel Monitoring System (VMS). The DAS database integrates the Call-In data and the VMS data. Five access area classifications are used: 'closed area', 'US/CAN resource sharing area', 'B-day program', 'hook sector', and 'open area'; if a trip was not classified to one of the first four access area categories, then 'open area' was assigned.

### **Methods**

In this analysis, the sampling unit is a trip. Trips are partitioned into fleet sectors using six classification variables: calendar quarter, area fished, gear type, mesh, access area, and trip category. Calendar quarter is based on landed date and used to capture seasonal variations in fishing activity and discard rates. Area fished is based on the statistical area; trips where area is unknown are excluded. Two areas are defined: New England (NE) comprising statistical areas < '600' and Mid-Atlantic (MA) comprising statistical areas  $\geq$  '600'. Gear type is based on Northeast gear code (*negear*); some gear codes were combined (Table 2); trips for which gear is unknown are excluded. Mesh size groups were formed for otter trawl and gillnet gear types. For otter trawl, two mesh groups were formed: small (mesh less than 5.5 inches) and large (5.5 inch mesh and greater). For gillnet: three mesh groups were formed: small (mesh less than 5.5 inches); large (mesh between 5.5 and 7.99 inches) and extra large (mesh 8 inches and greater). Five access area categories were formed: 'closed area', 'US/CAN', 'B-day', 'HOOK', and 'open area'. A trip category was formed to subdivide the scallop fishery into General (Gen) and Limited (Lim) category trips; all other fisheries are categorized as 'all'.

The DAS information (fishery codes, DAS codes and access area codes) were used to classify all VTR trips to one of five access area categories. An indirect link of vessel permit and date was used to join the VTR trips with the DAS trips. A detailed description of the method developed and obstacles encountered when joining the VTR and DAS data is given in Appendix I.

A simple imputation approach was used in which data from adjoining strata were used. In this simple imputation only the temporal stratification, calendar quarter, was relaxed to half year recognizing that seasonal variation can occur for some species. The imputation was used to fill quarterly cells for which there were one or no observed trips. When all quarterly cells were missing or sparse observer coverage existed across quarters for a fleet, this fleet was omitted and no discard estimation was performed.

### Discard Estimation

To estimate total annual discards and precision (CV), we used a combined d/k ratio estimator (Cochran, 1963) where d = discard pounds of a given species and k = kept pounds of all species. The 2005 VTR landings were used to expand the discard rate to estimate total discard weight.

The combined ratio method is based on a ratio estimate pooled over all strata and trips within fleet.

Total discarded pounds for species j is defined as:

$$(1) \quad \hat{D}_j = \sum_{h=1}^Q K_h r_{c,j}$$

where

$$(2) \quad r_{c,j} = \frac{\sum_{h=1}^Q N_h \sum_{i=1}^{n_h} \frac{d_{jih}}{n_h}}{\sum_{h=1}^Q N_h \sum_{i=1}^{n_h} \frac{k_{ih}}{n_h}}$$

where  $\hat{D}_j$  is total discarded pounds for species j;  $K_h$  is VTR total kept pounds in stratum h;  $r_{c,j}$  is the **combined ratio** of species j;  $d_{jih}$  is discards of species j from trip i in stratum h;  $k_{ih}$  is kept pounds of all species on trip i in stratum h;  $N_h$  is the number of VTR trips in stratum h;  $n_h$  is the number of observed trips in stratum h. In Eq 2 the summation over strata h = 1 to Q is over calendar quarters and the other strata values are held constant. Equation 3 requires a more explicit definition of the stratum designation since the summation over quarter relies on an annual average ratio defined in Eq 2.

Variance of  $\hat{D}_j$  for species j is defined as:

$$(3) \quad V(\hat{D}_j) = \sum_{q=1}^4 K_{qh}^2 \left( \frac{N_{qh} - n_{qh}}{n_{qh} N_{qh}} \right) \frac{1}{\left( \frac{\sum_{i=1}^{n_h} k_{iqh}}{n_{qh}} \right)^2} \left[ \frac{\sum_{i=1}^{n_h} (d_{jiqh}^2 + (r_{c,j})^2 k_{iqh}^2 - 2r_{c,j} d_{jiqh} k_{iqh})}{n_{qh} - 1} \right]$$

where  $\hat{D}_j$  is total discarded pounds for species  $j$ ;  $K_{qh}$  is VTR total kept pounds in quarter  $q$  and stratum  $h$ ;  $r_{c,j}$  is the **combined ratio** of species  $j$ ;  $d_{jiqh}$  is discards of species  $j$  from trip  $i$  in quarter  $q$  and stratum  $h$ ;  $k_{iqh}$  is kept pounds of all species on trip  $i$  in quarter  $q$  and stratum  $h$ ;  $N_{qh}$  is the number of VTR trips in quarter  $q$  and stratum  $h$ ;  $n_{qh}$  is the number of observed trips in quarter  $q$  and stratum  $h$ .

Coefficient of variation of  $\hat{D}_j$  is defined as:

$$(4) \quad CV(\hat{D}_j) = \frac{\sqrt{V(\hat{D}_j)}}{\hat{D}_j}$$

We have assumed 100% discard mortality. If survival ratios are used in a stock assessment, then we apply the survival ratio to the discard estimate. Survival ratios are available for spiny dogfish and summer flounder (Appendix Table 1).

### Method Validation

Validation of total discards was performed by estimating landings using the NEFOP data set and comparing estimated landings to the VTR landings and to the Dealer landings, by species.

To estimate landings using the NEFOP data, the same estimation method was used, however, the species-specific discard ( $d_j$ ) was replaced with species-specific kept pounds ( $k_j$ ).

$$(5) \quad \hat{L}_j = \sum_{h=1}^Q K_h r_{c,j}$$

where

$$(6) \quad r_{c,j} = \frac{\sum_{h=1}^Q N_h \sum_{i=1}^{n_h} \frac{k_{jih}}{n_h}}{\sum_{h=1}^Q N_h \sum_{i=1}^{n_h} \frac{k_{ih}}{n_h}}$$

where  $\hat{L}_j$  is total kept pounds for species  $j$ ;  $K_h$  is VTR total kept pounds in stratum  $h$ ;  $r_{c,j}$  is the **combined ratio** of species  $j$ ;  $k_{jih}$  is kept pounds of species  $j$  from trip  $i$  in stratum  $h$ ;  $k_{ih}$  is kept pounds of all species on trip  $i$  in stratum  $h$ ;  $N_h$  is the number of VTR trips in stratum  $h$ ;  $n_h$  is the

number of observed trips in stratum h. In Eq 6 the summation over strata h = 1 to Q is over calendar quarters and the other strata values are held constant. Equation 3 requires a more explicit definition of the stratum designation since the summation over quarter relies on an annual average ratio defined in Eq 6.

Variance of  $\hat{L}_j$  for species j is defined as:

$$(7) \quad V(\hat{L}_j) = \sum_{q=1}^4 K_{qh}^2 \left( \frac{N_{qh} - n_{qh}}{n_{qh} N_{qh}} \right) \frac{1}{\left( \frac{\sum_{i=1}^{n_h} k_{iqh}}{n_{qh}} \right)^2} \left[ \frac{\sum_{i=1}^{n_h} (k_{jih}^2 + (r_{c,j})^2 k_{iqh}^2 - 2r_{c,j} k_{jih} k_{iqh})}{n_{qh} - 1} \right]$$

where  $\hat{L}_j$  is total kept pounds for species j;  $K_{qh}$  is VTR total kept pounds in quarter q and stratum h;  $r_{c,j}$  is the **combined ratio** of species j ;  $k_{jih}$  is kept pounds of species j from trip i in quarter q and stratum h;  $k_{iqh}$  is kept pounds of all species on trip i in quarter q and stratum h;  $N_{qh}$  is the number of VTR trips in quarter q and stratum h;  $n_{qh}$  is the number of observed trips in quarter q and stratum h.

Coefficient of variation of  $\hat{L}_j$  is defined as:

$$(8) \quad CV(\hat{L}_j) = \frac{\sqrt{V(\hat{L}_j)}}{\hat{L}_j}$$

The 95% confidence intervals were calculated about the estimate of total landings for each species.

## Results and Discussion

Based on 2005 observer coverage, discards were estimated for 33 species from 25 of the 77 fleets examined (Tables 1, 2 and 5). A total of 3,565 trips<sup>1</sup> were observed in 2005. The majority of observer coverage occurred in the otter trawl fleets, gillnet fleets and scallop dredge fleets. Although the observer coverage is relatively high in 2005 compared with previous years, there are some fleets with little or no observer coverage. With limited temporal coverage for some fleets, imputation was used. It is recognized that using half-year estimates may not be appropriate for all species and that in some cells quarterly discard ratios were based on small sample sizes. This will contribute to lower precision (higher variability) of the discard estimates.

---

<sup>1</sup> Trips were partitioned when the trip characteristics fell into more than one fleet.

The 2005 VTR landings (all species combined, live mt) by fleet and quarter were used to expand the discard ratios (Table 3). Dealer data could not be used to expand the discard ratio because these data do not contain two key variables that define fisheries, e.g. mesh and area fished. VTR data were used as a surrogate for Dealer data. The combined d/k ratios by species and fleet in 2005 are presented in Table 4.

The 2005 total annual discard weights (with and without survival ratios applied) for each species is presented in Table 5a and 5b, respectively. Because discards have not been estimated for *all* fisheries, the estimates presented here represent an underestimate of the *total* discards in 2005. These discard estimates (either total or for particular gears) have been qualitatively compared to other estimates generated for these species in recent years and are generally consistent (in the same order of magnitude) with discard estimates of these species from other studies including the Standardized Bycatch Reporting Methodology analysis using 2004 data (Wigley et al. 2007), stock assessments conducted during the Groundfish Assessment Review Meeting in 2005, and various SAW/SARC analyses.

The precision (CV) of total annual discarded weight by species and fleet is presented in Table 6.

In most cases, the '*good faith hail*' reported in the VTR landings approximate the Dealer landings. Only 6 of the 39 species and species groups listed in Table 7 have VTR landings that exceed Dealer landings. And when two of the six (offshore hake and red hake) are combined with white hake, the resulting VTR landings which are only slightly are less than Dealer landings (1,996 mt vs 2,063 mt respectively). For cases where Dealer landings exceed VTR landings, such as bluefish, scup, black sea bass, differences may be attributed to the inability to partition out the mandatory reporting landings (reflective of the VTR) from the state landings. Differences for monkfish may be attributed to the misreporting of monkfish (tails vs whole) in the VTR data, or, in the case of monkfish,

Validation of the estimation method and underlying data is important. For many of the species and species groups, the estimated landings based on the NEFOP data set compared favorably to the VTR landings, the 95% confidence interval of the estimated landings encompassed the VTR landings (Table 7, Figure 1). There are three species (surf clams, ocean quahogs, and red crabs) for which the 95% confidence intervals of the estimated landings do not encompass the VTR or Dealer landings. These are species for which there is a gear-specific, directed fishery and no observer coverage of these fisheries in 2005, thus it is expected that the estimated landings of these species would not approximate the VTR landings. It is interesting to note the underestimation of surf clams and the overestimation of ocean quahogs in the estimated landings based on the incidental catch from fisheries observed in NEFOP data set, and yet the combined estimated landings of these two species provides a general close approximation to VTR landings. For the three hake species (red, white and offshore hake) and the two squid species (*Illex* and *Loligo*), there may be some reporting of 'mixed' species such that the individual species level does not compare as favorably as the combined species level (Table 7 and Figure 1).

The current databases do not contain the needed information to match trips directly (i.e. one to one match) across databases and hence ad-hoc methods were developed and some misclassification of trips to a fishery sector may have occurred. Some of the mis-classifications of

trips are evident in Table 2. Examples are these ‘data irregularities’ including a) VTR trips < NEFOP trips, and b) US/CAN area classification with MA area fished. Also contributing to the mis-classification of trips to a fishery is the limited auditing of the VTR data resulting in overlapping trip dates, incorrect gear codes and area fished. In the NEFOP data, there was difficulty in identifying observed trips that ‘flipped’ between the B-day program and other programs. When matching between VTR and DAS, 80 VTR trips had conflicting DAS codes. These were resolved by using the DAS code associated with the longest days absent (see Appendix I). When inconsistencies between VTR gear and DAS access area occurred, we assumed that VTR gear was correct.

An additional database issue encountered was the lack of master conversion tables in the NEFOP and in the VTR databases. For the NEFOP, no master conversion factor table was available to convert dressed weight to live weight. It is not correct to combine different units of measure into one combined estimate thus it was necessary to convert dressed weight to live weight, especially for the denominator of the discard ratio. For this analysis, a conversion factor table built for another analysis was used. For VTR data, the conversion between units of measure other than pounds (e.g. bushels, trays, bags, gallons, barrels) to pounds was needed. For this analysis, conversion factor table built for another analysis was used<sup>2</sup>.

In summary, a very broad stratification was used to encompass all species examined in this analysis. The discard estimates provided in this report will differ from discard estimates derived for and used in stock assessments. For stock assessments, the stratification, as well as the methods, are tailored to each species/stock to capture the appropriate seasonal, geographical, and gear/mesh discarding patterns that are species/stock specific.

## References

- Cochran, W.L. 1963. Sampling Techniques. J. Wiley and Sons. New York.
- Wigley, S.E., P.J. Rago, K.A. Sosebee, and D.L. Palka. 2007. The Analytic Component to the Standardized Bycatch Reporting Methodology Omnibus Amendment: Sampling Design, and Estimation of Precision and Accuracy (2nd Edition). US Dep. Commer., *Northeast Fish. Sci. Cent. Ref. Doc. 07-09*; 156 p.  
<http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0709/>

## Acknowledgements

We wish to thank all the NEFOP observers for their diligent efforts to collect the discard information used in this analysis.

---

<sup>2</sup> Since the National Bycatch analysis was conducted, a VTR conversion table has been created.

Table 1. List of Northeast species, and their scientific name, examined for the National Bycatch Report. Skate species are not considered individually, but as a complex in this analysis.

Species	Scientific Name
1 Bluefish	<i>Pomatomus saltatrix</i>
2 Atlantic Herring	<i>Clupea harengus</i>
3 Atlantic Salmon	<i>Salmo salar</i>
4 Deep Sea Red Crab	<i>Chaceon quinquedens</i>
5 Atlantic Sea Scallop	<i>Placopecten magellanicus</i>
6 Atlantic Mackerel	<i>Scomber scombrus</i>
7 Shortfinned Squid	<i>Illex illecebrosus</i>
8 Longfinned Squid	<i>Loligo pealeii</i>
9 Butterfish	<i>Peprilus triacanthus</i>
10 Monkfish	<i>Lophius americanus</i>
11 Atlantic Cod	<i>Gadus morhua</i>
12 Haddock	<i>Melanogrammus aeglefinus</i>
13 Yellowtail Flounder	<i>Limanda ferruginea</i>
14 American Plaice	<i>Hippoglossoides platessoides</i>
15 Witch Flounder	<i>Glyptocephalus cynoglossus</i>
16 Winter Flounder	<i>Pseudopleuronectes americanus</i>
17 Pollock	<i>Pollachius virens</i>
18 Acadian Redfish	<i>Sebastes fasciatus</i>
19 White Hake	<i>Urophycis tenuis</i>
20 Windowpane Flounder	<i>Scophthalmus aquosus</i>
21 Atlantic Halibut	<i>Hippoglossus hippoglossus</i>
22 Ocean Pout	<i>Macrozoarces americanus</i>
23 Silver Hake	<i>Merluccius bilinearis</i>
24 Offshore Hake	<i>Merluccius albidus</i>
25 Red Hake	<i>Urophycis chuss</i>
26 Skate Complex	
Winter Skate	<i>Leucoraja ocellata</i>
Thorny Skate	<i>Amblyraja radiata</i>
Little Skate	<i>Leucoraja erinacea</i>
Barndoor Skate	<i>Dipturus leavis</i>
Smooth Skate	<i>Malacoraja senta</i>
Clearnose Skate	<i>Raja eglanteria</i>
Rosette Skate	<i>Leucoraja garmani</i>
27 Spiny Dogfish	<i>Squalus acanthias</i>
28 Summer Flounder (Fluke)	<i>Paralichthys dentatus</i>
29 Scup	<i>Stenotomus chrysops</i>
30 Black Sea Bass	<i>Centropristes striata</i>
31 Atlantic Surfclam	<i>Spisula solidissima</i>
32 Ocean Quahog	<i>Artica islandica</i>
33 Tilefish	<i>Lopholatilus chamaeleonticeps</i>

blank page for pagination

Table 2. Number of VTR and NEFOP trips by fleet and calendar quarter in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)	Number of VTR trips in 2005					Number of NEFOP trips in 2005					VTR < NEFOP Imputation / Comments	
						QTR 1	QTR 2	QTR 3	QTR4	TOTAL	QTR 1	QTR 2	QTR 3	QTR4	TOTAL		
Longline	HOOK	NE	all	all	010	1			427	428					95	95	
Longline	OPEN	MA	all	all	010	10	5	8	19	42				1	1		
Longline	OPEN	NE	all	all	010	550	152	254	196	1,152	53	32	13	89	187		
Hand Line	OPEN	MA	all	all	020	86	778	1,777	958	3,599				1	1		
Hand Line	OPEN	NE	all	all	020	170	481	1,611	375	2,637	6	4	1		11		
Harpoon	OPEN	MA	all	all	030			1		1							
Harpoon	OPEN	NE	all	all	030		5	13		18							
Longline, Pelagic	OPEN	MA	all	all	040	3	7	9		19							
Longline, Pelagic	OPEN	NE	all	all	040	3		1		4							
Otter Trawl	B	MA	large	all	050	1	1	1		3	1				1		
Otter Trawl	B	NE	small	all	050						12	5	4		21		
Otter Trawl	B	NE	large	all	050	161	84	186	14	445	106	62	42	3	213		
Otter Trawl	OPEN	MA	small	all	050	800	917	580	1,048	3,345	51	20	31	48	150		
Otter Trawl	OPEN	MA	large	all	050	1,357	3,156	4,337	1,608	10,458	12	10	35	16	73		
Otter Trawl	OPEN	NE	small	all	050	507	734	648	497	2,386	28	17	72	37	154		
Otter Trawl	OPEN	NE	large	all	050	2,164	2,667	4,863	2,806	12,500	95	62	277	181	615		
Otter Trawl	USCAN	MA	small	all	050			1	1	2							
Otter Trawl	USCAN	MA	large	all	050	1	1			2							
Otter Trawl	USCAN	NE	small	all	050	3	2	2	5	12	17	16	2	14	49		
Otter Trawl	USCAN	NE	large	all	050	288	373	188	388	1,237	133	163	46	118	460		
Scallop Trawl	CLOSED	MA	all	general	052			18	112	130				1	1		
Scallop Trawl	CLOSED	MA	all	limited	052	1	8	3	6	18							
Scallop Trawl	CLOSED	NE	all	limited	052			5	1	6							
Scallop Trawl	OPEN	MA	all	general	052	58	834	1,821	316	3,029	8	20	74	23	125		
Scallop Trawl	OPEN	MA	all	limited	052	9	31	19	12	71							
Scallop Trawl	OPEN	NE	all	general	052	13	2	15		30							
Scallop Trawl	OPEN	NE	all	limited	052			2		2							
Shrimp Trawl	OPEN	MA	all	all	058	4		4		8							
Shrimp Trawl	OPEN	NE	all	all	058	2,402			142	2,544	16				16		
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all	100, 110	313	392	689	492	1,886				1	1		
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all	100, 110	50	263	121	373	807				1	1		
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	100, 110	364	1,302	342	647	2,655	9	41	1	8	59		
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all	100, 110	2	5	4	10	21			2		2		
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	100, 110	853	946	2,146	1,377	5,322	100	12	265	129	506		
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	100, 110	531	1,385	1,676	1,137	4,729	36	24	211	100	371		
Purse Seine	OPEN	MA	all	all	121, 120			113	8	121							
Purse Seine	OPEN	NE	all	all	121, 120		26	156	33	215		2	17	4	23		
Scallop Dredge	CLOSED	MA	all	general	132	7	2	57	871	937				2	2		
Scallop Dredge	CLOSED	MA	all	limited	132	114	289	182	59	644	18	18	10	6	52		
Scallop Dredge	CLOSED	NE	all	general	132	8	18	181	297	504		2	9	1	12		
Scallop Dredge	CLOSED	NE	all	limited	132	93	39	486	161	779	9	1	26	18	54		
Scallop Dredge	OPEN	MA	all	general	132	1,085	2,365	3,468	1,853	8,771	7	15	47	22	91		
Scallop Dredge	OPEN	MA	all	limited	132	257	580	194	169	1,200	14	8	13	9	44		
Scallop Dredge	OPEN	NE	all	general	132	503	2,149	2,224	603	5,479	11	3			14		
Scallop Dredge	OPEN	NE	all	limited	132	91	59	131	159	440	2	5	9	5	21		
Mid-water paired & single Trawl	OPEN	MA	all	all	170, 370	250	55	2	1	308	10	1			11		
Mid-water paired & single Trawl	OPEN	NE	all	all	170, 370	38	154	319	224	735	7	30	42	29	108		

Table 2 *continued*. Number of VTR and NEFOP trips by fleet and calendar quarter in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)	Number of VTR trips in 2005					Number of NEFOP trips in 2005					VTR v NEFOP Imputation / Comments
						QTR 1	QTR 2	QTR 3	QTR4	TOTAL	QTR 1	QTR 2	QTR 3	QTR4	TOTAL	
Fish Pots/ Traps	OPEN	MA	all	all	181	16	395	445	322	1,178						no discard estimation
Fish Pots/ Traps	OPEN	NE	all	all	181	1	247	851	247	1,346					2	2
Lobster Pots	OPEN	MA	all	all	200	217	799	1,442	593	3,051						no discard estimation
Lobster Pots	OPEN	NE	all	all	200	2,702	6,033	14,113	10,746	33,594				1	1	1
Crab Pots	OPEN	MA	all	all	300	9	14	72	24	119						no discard estimation
Crab Pots	OPEN	NE	all	all	300	8	7	36	24	75						no discard estimation
Scottish Seine	OPEN	MA	all	all	360		7	2		9						no discard estimation
Scottish Seine	OPEN	NE	all	all	360		7	2		9						no discard estimation
Clam Quahog Dredge	OPEN	MA	all	all	400, 386	694	908	1,253	994	3,849	1			2	2	5
Clam Quahog Dredge	OPEN	NE	all	all	400, 386	660	995	609	513	2,777	1					1
Troll Line	OPEN	MA	all	all	060										2	2
Floating Trap	OPEN	MA	all	all	080		21	2		23						no discard estimation
Floating Trap	OPEN	NE	all	all	080		21	113	18	152						no discard estimation
Danish Seine	OPEN	MA	all	all	160		1			1						no discard estimation
Pots + Traps	OPEN	NE	all	all	180	2				2						no discard estimation
Pots + Traps, Conch	OPEN	MA	all	all	183	57	187	53	448	745						no discard estimation
Pots + Traps, Conch	OPEN	NE	all	all	183		42	182	130	354						no discard estimation
Pots + Traps, Hagfish	OPEN	NE	all	all	186	13	51	51	17	132						no discard estimation
Pots + Traps, Shrimp	OPEN	NE	all	all	190	237				237						no discard estimation
Rakes	OPEN	MA	all	all	250		9			9						no discard estimation
Rakes	OPEN	NE	all	all	250		1			1						no discard estimation
Diving Gear	OPEN	MA	all	all	330			1		1						no discard estimation
Diving Gear	OPEN	NE	all	all	330		28	31	3	62						no discard estimation
Beam Trawl	OPEN	MA	all	all	350	25	50	85	34	194						no discard estimation
Beam Trawl	OPEN	NE	all	all	350	87	49	64	20	220						no discard estimation
Dredge, Other	OPEN	MA	all	all	381	326	1	5	140	472						no discard estimation
Dredge, Other	OPEN	NE	all	all	381	1				1	4	2		1	7	X no discard estimation
Dredge, Mussel	OPEN	NE	all	all	385				6	6						no discard estimation
Dredge, Urchin	OPEN	MA	all	all	387				1	1						no discard estimation
Dredge, Urchin	OPEN	NE	all	all	387	9	19	8	19	55						no discard estimation
<b>TOTAL</b>						18,215	30,158	48,279	31,704	128,356	767	576	1,256	966	3,565	

Table 3. VTR landings (live, mt), by fleet and calendar quarter in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)	QTR 1	QTR 2	QTR 3	QTR 4	TOTAL
<b>Longline</b>	HOOK	NE	all	all	010	0.7		608.3		<b>609.0</b>
<b>Longline</b>	OPEN	MA	all	all	010	60.2	40.3	75.2	61.8	<b>237.5</b>
<b>Longline</b>	OPEN	NE	all	all	010	438.9	225.8	319.2	261.8	<b>1,245.7</b>
<b>Hand Line</b>	OPEN	MA	all	all	020	7.3	41.8	130.1	88.7	<b>267.8</b>
<b>Hand Line</b>	OPEN	NE	all	all	020	22.0	31.2	170.5	51.5	<b>275.2</b>
<b>Harpoon</b>	OPEN	MA	all	all	030			0.2		<b>0.2</b>
<b>Harpoon</b>	OPEN	NE	all	all	030		1.1	3.2		<b>4.3</b>
<b>Longline, Pelagic</b>	OPEN	MA	all	all	040	3.2	6.6	6.7		<b>16.5</b>
<b>Longline, Pelagic</b>	OPEN	NE	all	all	040	0.2		4.1		<b>4.3</b>
<b>Otter Trawl</b>	B	MA	large	all	050	11.3	12.3	0.2		<b>23.8</b>
<b>Otter Trawl</b>	B	NE	small	all	050					
<b>Otter Trawl</b>	B	NE	large	all	050	1,769.5	1,296.6	2,400.9	117.3	<b>5,584.3</b>
<b>Otter Trawl</b>	OPEN	MA	small	all	050	9,891.2	7,188.1	8,432.0	5,944.4	<b>31,455.7</b>
<b>Otter Trawl</b>	OPEN	MA	large	all	050	4,549.5	2,809.6	3,550.5	2,102.1	<b>13,011.7</b>
<b>Otter Trawl</b>	OPEN	NE	small	all	050	3,836.7	3,143.5	3,333.1	4,116.5	<b>14,429.8</b>
<b>Otter Trawl</b>	OPEN	NE	large	all	050	5,230.9	4,807.7	5,569.0	4,149.8	<b>19,757.4</b>
<b>Otter Trawl</b>	USCAN	MA	small	all	050			0.4	1.8	<b>2.2</b>
<b>Otter Trawl</b>	USCAN	MA	large	all	050	13.2	3.0			<b>16.1</b>
<b>Otter Trawl</b>	USCAN	NE	small	all	050	44.2	28.9	24.1	21.1	<b>118.3</b>
<b>Otter Trawl</b>	USCAN	NE	large	all	050	3,371.3	4,803.5	2,447.6	4,203.4	<b>14,825.9</b>
<b>Scallop Trawl</b>	CLOSED	MA	all	general	052			21.1	126.9	<b>148.0</b>
<b>Scallop Trawl</b>	CLOSED	MA	all	limited	052	60.5	310.5	92.6	19.8	<b>483.4</b>
<b>Scallop Trawl</b>	CLOSED	NE	all	limited	052			274.4	118.2	<b>392.6</b>
<b>Scallop Trawl</b>	OPEN	MA	all	general	052	67.2	1,156.1	2,233.3	410.4	<b>3,866.9</b>
<b>Scallop Trawl</b>	OPEN	MA	all	limited	052	46.9	789.7	377.9	173.3	<b>1,387.7</b>
<b>Scallop Trawl</b>	OPEN	NE	all	general	052	14.7	2.6	28.4		<b>45.7</b>
<b>Scallop Trawl</b>	OPEN	NE	all	limited	052			75.0		<b>75.0</b>
<b>Shrimp Trawl</b>	OPEN	MA	all	all	058	2.2		3.9		<b>6.2</b>
<b>Shrimp Trawl</b>	OPEN	NE	all	all	058	1,883.9			133.7	<b>2,017.5</b>
<b>Sink, Anchor, Drift Gillnet</b>	OPEN	MA	small	all	100, 110	751.3	218.7	408.3	433.1	<b>1,811.4</b>
<b>Sink, Anchor, Drift Gillnet</b>	OPEN	MA	large	all	100, 110	114.5	205.8	59.6	305.3	<b>685.2</b>
<b>Sink, Anchor, Drift Gillnet</b>	OPEN	MA	xlg	all	100, 110	343.6	1,537.6	358.8	607.7	<b>2,847.7</b>
<b>Sink, Anchor, Drift Gillnet</b>	OPEN	NE	small	all	100, 110	3.4	2.9	5.0	4.5	<b>15.7</b>
<b>Sink, Anchor, Drift Gillnet</b>	OPEN	NE	large	all	100, 110	699.2	751.1	1,795.3	1,327.7	<b>4,573.2</b>
<b>Sink, Anchor, Drift Gillnet</b>	OPEN	NE	xlg	all	100, 110	748.5	2,679.3	2,738.3	1,311.8	<b>7,477.9</b>
<b>Purse Seine</b>	OPEN	MA	all	all	121, 120			7,711.1	582.9	<b>8,293.9</b>
<b>Purse Seine</b>	OPEN	NE	all	all	121, 120		1,274.5	12,604.2	2,773.4	<b>16,652.1</b>
<b>Scallop Dredge</b>	CLOSED	MA	all	general	132	27.0	67.6	83.4	1,192.7	<b>1,370.6</b>
<b>Scallop Dredge</b>	CLOSED	MA	all	limited	132	4,761.6	16,003.1	6,015.8	656.5	<b>27,437.0</b>
<b>Scallop Dredge</b>	CLOSED	NE	all	general	132	88.1	35.8	559.7	386.4	<b>1,070.0</b>
<b>Scallop Dredge</b>	CLOSED	NE	all	limited	132	5,033.2	2,366.1	29,961.7	8,031.2	<b>45,392.2</b>
<b>Scallop Dredge</b>	OPEN	MA	all	general	132	1,788.5	3,612.4	4,886.7	2,609.3	<b>12,896.9</b>
<b>Scallop Dredge</b>	OPEN	MA	all	limited	132	14,796.2	42,223.4	9,889.0	5,596.1	<b>72,504.8</b>
<b>Scallop Dredge</b>	OPEN	NE	all	general	132	764.2	2,792.4	2,925.3	706.4	<b>7,188.3</b>
<b>Scallop Dredge</b>	OPEN	NE	all	limited	132	5,176.1	5,197.4	11,168.5	8,828.5	<b>30,370.5</b>
<b>Mid-water paired &amp; single Trawl</b>	OPEN	MA	all	all	170, 370	40,985.1	8,193.9	213.2	13.6	<b>49,405.8</b>
<b>Mid-water paired &amp; single Trawl</b>	OPEN	NE	all	all	170, 370	3,174.3	12,886.0	27,115.2	28,292.3	<b>71,467.8</b>

Table 3 *continued.* VTR landings (live, mt), by fleet and calendar quarter in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)	QTR 1	QTR 2	QTR 3	QTR 4	TOTAL
Fish Pots/ Traps	OPEN	MA	all	all	181	5.2	136.8	130.3	126.8	399.2
Fish Pots/ Traps	OPEN	NE	all	all	181	20.6	44.1	134.4	45.9	245.0
Lobster Pots	OPEN	MA	all	all	200	33.3	152.7	315.2	338.3	839.7
Lobster Pots	OPEN	NE	all	all	200	1,547.1	1,629.8	2,851.6	3,305.2	9,333.7
Crab Pots	OPEN	MA	all	all	300	199.3	85.0	114.5	296.3	695.1
Crab Pots	OPEN	NE	all	all	300	211.8	125.5	381.7	307.2	1,026.2
Scottish Seine	OPEN	MA	all	all	360		3.1	0.6		3.7
Scottish Seine	OPEN	NE	all	all	360		1.6	0.6		2.3
Clam Quahog Dredge	OPEN	MA	all	all	400, 386	41,671.7	48,872.3	59,237.6	49,506.8	199,288.4
Clam Quahog Dredge	OPEN	NE	all	all	400, 386	8,546.8	9,972.5	4,436.9	7,411.1	30,367.4
Troll Line	OPEN	MA	all	all	060					
Floating Trap	OPEN	MA	all	all	080		67.1	1.1		68.2
Floating Trap	OPEN	NE	all	all	080		16.0	34.9	4.3	55.1
Danish Seine	OPEN	MA	all	all	160		1.8			1.8
Pots + Traps	OPEN	NE	all	all	180	3.6				3.6
Pots + Traps, Conch	OPEN	MA	all	all	183	61.7	107.4	63.1	314.3	546.6
Pots + Traps, Conch	OPEN	NE	all	all	183		12.6	78.0	53.7	144.3
Pots + Traps, Hagfish	OPEN	NE	all	all	186	106.4	277.5	306.1	132.6	822.5
Pots + Traps, Shrimp	OPEN	NE	all	all	190	116.8				116.8
Rakes	OPEN	MA	all	all	250		1.8			1.8
Rakes	OPEN	NE	all	all	250			1.0		1.0
Diving Gear	OPEN	MA	all	all	330			0.1		0.1
Diving Gear	OPEN	NE	all	all	330		2.6	2.3	0.1	5.0
Beam Trawl	OPEN	MA	all	all	350	66.4	39.1	196.9	15.5	317.9
Beam Trawl	OPEN	NE	all	all	350	137.5	84.0	42.2	25.9	289.6
Dredge, Other	OPEN	MA	all	all	381	159.4	0.3	340.2	64.5	564.3
Dredge, Other	OPEN	NE	all	all	381	0.6				0.6
Dredge, Mussel	OPEN	NE	all	all	385				32.8	32.8
Dredge, Urchin	OPEN	MA	all	all	387				23.6	23.6
Dredge, Urchin	OPEN	NE	all	all	387	1.7	50.8	27.1	6.4	86.0
<b>TOTAL</b>						163,470.1	188,431.5	216,769.0	148,381.5	<b>717,052.1</b>

Table 4. Combined discard to kept (d/k) ratios, by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)											
						BLUEFISH	ATLANTIC HERRING	ATLANTIC SALMON	DEEP SEA RED CRAB	ATLANTIC SEA SCALLOP	ATLANTIC MACKEREL	ILLEX SQUID	LOLIGO SQUID	BUTTERFISH	MONKFISH	ATLANTIC COD
Longline	HOOK	NE	all	all	010	0.000000	0.000021	0.000000	0.000000	0.000003	0.000000	0.000000	0.000000	0.000000	0.000009	0.002442
Longline	OPEN	MA	all	all	010											
Longline	OPEN	NE	all	all	010	0.000000	0.000000	0.000000	0.000000	0.000005	0.000000	0.000000	0.000000	0.000000	0.000005	0.036878
Hand Line	OPEN	MA	all	all	020											
Hand Line	OPEN	NE	all	all	020	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.084327
Otter Trawl	B	MA	large	all	050											
Otter Trawl	B	NE	small	all	050											
Otter Trawl	B	NE	large	all	050	0.000119	0.000001	0.000000	0.000001	0.002514	0.000016	0.000192	0.000045	0.000001	0.012609	0.009661
Otter Trawl	OPEN	MA	small	all	050	0.000001	0.005771	0.000000	0.000012	0.000001	0.006752	0.044167	0.018770	0.021115	0.005194	0.000003
Otter Trawl	OPEN	MA	large	all	050	0.000592	0.000000	0.000000	0.000147	0.000001	0.000005	0.000014	0.000050	0.000290	0.002291	0.000000
Otter Trawl	OPEN	NE	small	all	050	0.000124	0.017495	0.000000	0.000002	0.000247	0.068156	0.013164	0.021422	0.021862	0.011477	0.003066
Otter Trawl	OPEN	NE	large	all	050	0.000314	0.000218	0.000000	0.002109	0.000775	0.000044	0.000309	0.000100	0.000030	0.018645	0.015409
Otter Trawl	USCAN	MA	small	all	050											
Otter Trawl	USCAN	MA	large	all	050											
Otter Trawl	USCAN	NE	small	all	050	0.000112	0.000034	0.000000	0.000001	0.000157	0.000019	0.000036	0.000063	<0.000001	0.007908	0.012990
Otter Trawl	USCAN	NE	large	all	050	0.000367	0.000170	0.000000	0.000002	0.002179	0.000022	0.000081	0.000042	0.000009	0.009751	0.017842
Scallop Trawl	CLOSED	MA	all	general	052											
Scallop Trawl	CLOSED	MA	all	limited	052											
Scallop Trawl	CLOSED	NE	all	limited	052											
Scallop Trawl	OPEN	MA	all	general	052	0.000000	0.000005	0.000000	0.000000	0.116429	0.000000	0.000024	0.000115	0.000013	0.015584	0.000000
Scallop Trawl	OPEN	MA	all	limited	052											
Scallop Trawl	OPEN	NE	all	general	052											
Scallop Trawl	OPEN	NE	all	limited	052											
Shrimp Trawl	OPEN	MA	all	all	058											
Shrimp Trawl	OPEN	NE	all	all	058	0.000000	0.004502	0.000000	0.000376	0.000049	0.000001	0.000152	0.000000	0.000561	0.000002	0.000001
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all	100, 110											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all	100, 110											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	100, 110	0.000002	0.000000	0.000000	0.000000	0.000637	0.000614	0.000000	0.000000	0.000000	0.078339	0.000103
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all	100, 110											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	100, 110	0.000001	0.000001	0.000000	0.000170	0.000002	0.000162	0.000000	0.000000	0.000000	0.000966	0.020068
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	100, 110	0.000002	0.000047	0.000000	0.000040	0.000035	0.003392	0.000000	0.000000	0.000000	0.052085	0.004500
Purse Seine	OPEN	MA	all	all	121, 120											
Purse Seine	OPEN	NE	all	all	121, 120	0.000036	0.057654	0.000000	0.000000	0.000000	0.000015	0.000000	0.000000	0.000000	0.000000	0.000000
Scallop Dredge	CLOSED	MA	all	general	132											
Scallop Dredge	CLOSED	MA	all	limited	132	0.000000	0.000000	0.000000	0.000005	0.028827	0.000003	0.000044	0.000054	<0.000001	0.027964	0.000000
Scallop Dredge	CLOSED	NE	all	general	132	0.000000	0.000000	0.000000	0.000000	0.116681	0.000000	0.000000	0.000000	0.000000	0.030019	0.000000
Scallop Dredge	CLOSED	NE	all	limited	132	0.000000	0.000000	0.000000	0.000000	0.014833	0.000000	<0.000001	<0.000001	<0.000001	0.008153	0.000034
Scallop Dredge	OPEN	MA	all	general	132	0.000000	0.000000	0.000000	0.000000	0.008195	0.000000	<0.000001	0.000043	0.000000	0.008587	0.000000
Scallop Dredge	OPEN	MA	all	limited	132	0.000000	<0.000001	0.000000	0.000000	0.027919	0.000017	0.000004	0.000013	0.000001	0.012872	0.000000
Scallop Dredge	OPEN	NE	all	general	132	0.000000	0.000000	0.000000	0.000000	0.069518	0.000000	0.000000	0.000000	0.000000	0.000066	0.000006
Scallop Dredge	OPEN	NE	all	limited	132	0.000000	0.000000	0.000000	0.000000	0.036165	0.000002	<0.000001	0.000002	0.000000	0.009512	0.000034
Mid-water paired & single Trawl	OPEN	MA	all	all	170, 370	0.000000	0.005682	0.000000	0.000000	0.006765	0.000000	0.000000	0.000000	0.000014	0.000000	
Mid-water paired & single Trawl	OPEN	NE	all	all	170, 370	0.000008	0.022124	0.000000	0.000000	0.000098	0.000016	<0.000001	0.000000	0.000003	0.000008	

Table 4 *continued*. Combined discard to kept (d/k) ratios, by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)												
						HADDOCK	YELLOWTAIL FLOUNDER	AMERICAN PLAICE	WITCH FLOUNDER	WINTER FLOUNDER	POLLOCK	ACADIAN REDFISH	WHITE HAKE	WINDOWPANE FLOUNDER	ATLANTIC HALIBUT	OCEAN POUT	
Longline	HOOK	NE	all	all	010	0.050454	0.000000	0.000014	0.000003	0.000000	0.000012	0.000240	0.000002	0.000000	0.000523	0.000021	
Longline	OPEN	MA	all	all	010												
Longline	OPEN	NE	all	all	010	0.029346	0.000011	0.000002	0.000000	0.000000	0.000162	0.000300	0.000877	0.000002	0.000077	0.002396	
Hand Line	OPEN	MA	all	all	020												
Hand Line	OPEN	NE	all	all	020	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
Otter Trawl	B	MA	large	all	050												
Otter Trawl	B	NE	small	all	050												
Otter Trawl	B	NE	large	all	050	0.008137	0.007710	0.000001	0.000002	0.000450	0.000463	0.002423	0.000378	0.011626	0.000182	0.000002	
Otter Trawl	OPEN	MA	small	all	050	0.000135	0.000267	0.000061	0.000001	0.000823	<0.000001	0.000036	0.000742	0.000002	0.000000	<0.000001	
Otter Trawl	OPEN	MA	large	all	050	0.000000	0.000013	0.000002	0.000160	0.000001	0.000000	0.000000	<0.000001	0.006452	0.000000	0.000000	
Otter Trawl	OPEN	NE	small	all	050	0.006539	0.000002	0.002368	0.003670	0.003226	0.000000	0.000126	0.004859	0.000001	0.000042	0.000002	
Otter Trawl	OPEN	NE	large	all	050	0.000001	0.012632	0.009710	0.005048	0.006017	0.000336	0.000002	0.000350	0.008017	0.000234	0.003326	
Otter Trawl	USCAN	MA	small	all	050												
Otter Trawl	USCAN	MA	large	all	050												
Otter Trawl	USCAN	NE	small	all	050	0.004579	0.012656	0.002952	0.003859	0.000002	0.000841	0.000302	0.000475	0.024715	0.000267	0.004056	
Otter Trawl	USCAN	NE	large	all	050	0.016206	0.007445	0.002509	0.002403	0.000906	0.000555	0.000002	0.000391	0.020217	0.000191	0.002916	
Scallop Trawl	CLOSED	MA	all	general	052												
Scallop Trawl	CLOSED	MA	all	limited	052												
Scallop Trawl	CLOSED	NE	all	limited	052												
Scallop Trawl	OPEN	MA	all	general	052	0.000015	0.000007	0.000003	0.000039	0.000000	0.000000	0.000005	0.000096	0.000001	0.000000	0.000124	
Scallop Trawl	OPEN	MA	all	limited	052												
Scallop Trawl	OPEN	NE	all	general	052												
Scallop Trawl	OPEN	NE	all	limited	052												
Shrimp Trawl	OPEN	MA	all	all	058												
Shrimp Trawl	OPEN	NE	all	all	058	0.000026	0.000001	0.008954	0.000002	0.006425	0.000056	0.000540	0.000490	0.000344	0.000037	0.000045	
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all	100, 110												
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all	100, 110												
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	100, 110	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000025	0.000000	0.000000	
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all	100, 110												
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	100, 110	0.000688	0.002589	0.000267	0.000293	0.000915	0.007397	0.000461	0.002404	0.000005	0.000172	0.000141	
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	100, 110	0.000254	0.000318	0.000139	0.000021	0.000261	0.000002	0.000290	0.000001	0.000004	0.000446	0.000186	
Purse Seine	OPEN	MA	all	all	121, 120												
Purse Seine	OPEN	NE	all	all	121, 120	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
Scallop Dredge	CLOSED	MA	all	general	132												
Scallop Dredge	CLOSED	MA	all	limited	132	0.000001	0.000002	0.000001	0.000615	0.000025	0.000000	0.000000	0.000001	0.000005	0.000000	0.000006	
Scallop Dredge	CLOSED	NE	all	general	132	0.000183	0.000001	0.000000	0.000000	0.000001	0.000000	0.000000	0.002137	0.000200	0.000000	0.000032	
Scallop Dredge	CLOSED	NE	all	limited	132	0.000053	0.002721	0.000057	0.000111	0.000001	<0.000001	0.000000	0.000041	0.000199	0.000000	0.000026	
Scallop Dredge	OPEN	MA	all	general	132	0.000000	0.000016	0.000000	0.000018	0.000402	0.000000	0.000000	0.000000	0.000001	0.000000	0.000011	
Scallop Dredge	OPEN	MA	all	limited	132	0.000000	0.000000	0.000017	0.000203	0.000055	0.000000	0.000004	0.000004	0.000203	<0.000001	0.000019	
Scallop Dredge	OPEN	NE	all	general	132	0.000000	0.000666	0.000016	0.000000	0.000001	0.000000	0.000000	0.000000	0.000002	0.000000	0.000085	
Scallop Dredge	OPEN	NE	all	limited	132	0.000027	0.003226	0.000143	0.000382	0.000002	0.000000	0.000000	0.000019	0.003559	<0.000001	0.000015	
Mid-water paired & single Trawl	OPEN	MA	all	all	170, 370	0.000000	0.000000	0.000000	0.000000	0.000000	0.000004	0.000000	0.000000	0.000000	0.000000	0.000000	
Mid-water paired & single Trawl	OPEN	NE	all	all	170, 370	0.000820	<0.000001	<0.000001	<0.000001	<0.000001	0.000072	0.000054	0.000006	0.000000	0.000000	0.000000	

Table 4 *continued*. Combined discard to kept (d/k) ratios, by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)	SILVER HAKE	OFFSHORE HAKE	RED HAKE	SKATES	SPINY DOGFISH	SUMMER FLOUNDER	SCUP	BLACK SEA BASS	ATLANTIC SURFCLAM	OCEAN QUAHOG	TILEFISH
Longline	HOOK	NE	all	all	010	0.000027	0.000000	0.000002	0.049613	0.018025	0.000000	0.000000	0.000000	0.000000	0.000000	
Longline	OPEN	MA	all	all	010											
Longline	OPEN	NE	all	all	010	0.000001	0.000000	0.000645	0.082932	0.123285	0.000000	0.000000	0.000000	0.000000	0.000000	
Hand Line	OPEN	MA	all	all	020											
Hand Line	OPEN	NE	all	all	020	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	
Otter Trawl	B	MA	large	all	050											
Otter Trawl	B	NE	small	all	050											
Otter Trawl	B	NE	large	all	050	0.002391	<0.000001	0.002287	0.689058	0.013183	0.015029	0.000002	<0.000001	0.000007	0.000073	0.000007
Otter Trawl	OPEN	MA	small	all	050	0.025822	0.000300	0.025370	0.060448	0.066613	0.008202	0.002740	0.002057	0.000065	0.000001	0.000074
Otter Trawl	OPEN	MA	large	all	050	0.000185	0.000000	0.000189	0.287851	0.076849	0.006483	0.028854	0.000388	0.000035	0.000005	0.000000
Otter Trawl	OPEN	NE	small	all	050	0.127592	0.000000	0.041409	0.048823	0.059649	0.009384	0.000001	0.000099	0.000000	0.000003	0.000002
Otter Trawl	OPEN	NE	large	all	050	0.000001	0.000003	0.000793	0.257634	0.120370	0.008370	0.003242	0.000462	0.000239	0.000203	0.000020
Otter Trawl	USCAN	MA	small	all	050											
Otter Trawl	USCAN	MA	large	all	050											
Otter Trawl	USCAN	NE	small	all	050	0.000001	0.000000	0.002347	0.513126	0.047456	0.013074	<0.000001	0.000000	0.000305	0.000010	0.000010
Otter Trawl	USCAN	NE	large	all	050	0.000974	0.000005	0.002528	0.600657	0.022799	0.016452	0.000002	0.000000	0.000041	0.000230	0.000000
Scallop Trawl	CLOSED	MA	all	general	052											
Scallop Trawl	CLOSED	MA	all	limited	052											
Scallop Trawl	CLOSED	NE	all	limited	052											
Scallop Trawl	OPEN	MA	all	general	052	0.000244	0.000000	0.000045	0.052965	0.002817	0.000137	<0.000001	0.000036	0.000003	0.000572	0.000000
Scallop Trawl	OPEN	MA	all	limited	052											
Scallop Trawl	OPEN	NE	all	general	052											
Scallop Trawl	OPEN	NE	all	limited	052											
Shrimp Trawl	OPEN	MA	all	all	058											
Shrimp Trawl	OPEN	NE	all	all	058	0.012592	0.000000	0.000245	0.002971	0.000015	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all	100, 110											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all	100, 110											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	100, 110	0.000006	0.000000	0.000000	0.100619	0.045004	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all	100, 110											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	100, 110	0.000184	0.000010	0.000092	0.012221	0.416483	<0.000001	0.000000	0.000000	0.000000	0.000000	0.000000
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	100, 110	0.000019	0.000000	0.000003	0.087407	0.049099	0.002889	0.000000	0.000000	<0.000001	0.000000	0.000430
Purse Seine	OPEN	MA	all	all	121, 120											
Purse Seine	OPEN	NE	all	all	121, 120	0.000000	0.000000	0.000000	<0.000001	0.000267	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Scallop Dredge	CLOSED	MA	all	general	132											
Scallop Dredge	CLOSED	MA	all	limited	132	0.000070	0.000000	0.000115	0.092185	0.000474	0.005025	0.000037	0.000059	0.000000	0.000006	0.000000
Scallop Dredge	CLOSED	NE	all	general	132	0.000044	0.000000	0.000433	0.029956	0.000106	0.000943	0.000000	0.000000	0.003495	0.000000	0.000000
Scallop Dredge	CLOSED	NE	all	limited	132	0.000088	0.000000	0.000080	0.026305	0.000186	0.000376	0.000000	0.000000	0.000004	0.000026	0.000000
Scallop Dredge	OPEN	MA	all	general	132	0.000014	0.000000	0.000023	0.102820	0.000001	0.002449	0.000001	0.000037	0.000036	0.000046	0.000000
Scallop Dredge	OPEN	MA	all	limited	132	0.000072	0.000000	0.000047	0.048632	0.000187	0.003140	0.000006	0.000035	0.000000	0.000127	0.000000
Scallop Dredge	OPEN	NE	all	general	132	0.000000	0.000000	0.000000	0.021081	0.000000	0.000024	0.000000	0.000000	0.000769	0.006094	0.000000
Scallop Dredge	OPEN	NE	all	limited	132	0.000166	0.000000	0.000589	0.057082	0.000187	0.002007	0.000001	0.000000	0.000118	0.000011	0.000000
Mid-water paired & single Trawl	OPEN	MA	all	all	170, 370	0.000000	0.000000	0.000000	0.000000	0.003207	0.000000	0.000111	0.000000	0.000000	0.000000	0.000000
Mid-water paired & single Trawl	OPEN	NE	all	all	170, 370	0.000142	0.000000	0.000006	<0.000001	0.002713	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Table 5a. Total discards (with survival ratios applied; in live, mt), by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)												
					BLUEFISH	ATLANTIC HERRING	ATLANTIC SALMON	DEEP SEA RED CRAB	ATLANTIC SEA SCALLOP	ATLANTIC MACKEREL	ILLEX SQUID	LOLIGO SQUID	BUTTERFISH	MONKFISH	ATLANTIC COD	
Longline	HOOK	NE	all	all	0.00	0.01	0.00	0.00	<0.01	0.00	0.00	0.00	0.00	<0.01	1.49	
Longline	OPEN	MA	all	all												
Longline	OPEN	NE	all	all	0.00	0.00	0.00	0.00	<0.01	0.00	0.00	0.00	0.00	<0.01	45.94	
Hand Line	OPEN	MA	all	all												
Hand Line	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.21	
Otter Trawl	B	MA	large	all												
Otter Trawl	B	NE	small	all												
Otter Trawl	B	NE	large	all	0.67	5.67	0.00	6.05	14.04	0.09	1.07	0.25	<0.01	70.41	53.95	
Otter Trawl	OPEN	MA	small	all	34.73	181.53	0.00	0.38	42.75	212.40	1389.30	590.43	664.19	163.39	0.10	
Otter Trawl	OPEN	MA	large	all	7.70	0.00	0.00	1.91	13.96	0.06	0.18	0.66	3.78	29.81	0.00	
Otter Trawl	OPEN	NE	small	all	1.78	252.46	0.00	22.54	3.56	983.48	189.95	309.12	315.46	165.61	44.24	
Otter Trawl	OPEN	NE	large	all	6.21	4.30	0.00	41.67	15.32	0.86	6.11	1.98	0.59	368.38	304.43	
Otter Trawl	USCAN	MA	small	all												
Otter Trawl	USCAN	MA	large	all												
Otter Trawl	USCAN	NE	small	all	0.01	<0.01	0.00	0.12	0.02	<0.01	<0.01	<0.01	<0.01	0.94	1.54	
Otter Trawl	USCAN	NE	large	all	5.44	2.52	0.00	28.07	32.30	0.32	1.20	0.63	0.13	144.57	264.52	
Scallop Trawl	CLOSED	MA	all	general												
Scallop Trawl	CLOSED	MA	all	limited												
Scallop Trawl	CLOSED	NE	all	limited												
Scallop Trawl	OPEN	MA	all	general	0.00	0.02	0.00	0.00	450.22	0.00	0.09	0.44	0.05	60.26	0.00	
Scallop Trawl	OPEN	MA	all	limited												
Scallop Trawl	OPEN	NE	all	general												
Scallop Trawl	OPEN	NE	all	limited												
Shrimp Trawl	OPEN	MA	all	all												
Shrimp Trawl	OPEN	NE	all	all	0.00	9.08	0.00	0.76	0.10	2.76	0.31	0.00	1.13	3.49	2.65	
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	4.96	0.00	0.00	0.00	1.81	1.75	0.00	0.00	0.00	223.09	0.29	
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all												
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	6.01	4.75	0.00	0.78	<0.01	0.74	0.00	0.00	0.00	4.42	91.78	
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	14.28	0.35	0.00	0.30	0.26	25.37	0.00	0.00	0.00	389.49	33.65	
Purse Seine	OPEN	MA	all	all												
Purse Seine	OPEN	NE	all	all	0.60	960.05	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	
Scallop Dredge	CLOSED	MA	all	general												
Scallop Dredge	CLOSED	MA	all	limited	0.00	0.00	0.00	0.14	790.91	0.09	1.20	1.48	0.01	767.25	0.00	
Scallop Dredge	CLOSED	NE	all	general	0.00	0.00	0.00	0.00	124.85	0.00	0.00	0.00	0.00	32.12	0.00	
Scallop Dredge	CLOSED	NE	all	limited	0.00	0.00	0.00	0.00	673.30	0.00	<0.01	0.01	<0.01	370.09	1.55	
Scallop Dredge	OPEN	MA	all	general	0.00	0.00	0.00	0.00	105.69	0.00	<0.01	0.56	0.00	110.74	0.00	
Scallop Dredge	OPEN	MA	all	limited	0.00	0.03	0.00	0.00	2024.29	1.26	0.32	0.94	0.08	933.29	0.00	
Scallop Dredge	OPEN	NE	all	general	0.00	0.00	0.00	0.00	499.72	0.00	0.00	0.00	0.00	0.47	0.04	
Scallop Dredge	OPEN	NE	all	limited	0.00	0.00	0.00	0.00	1098.35	0.07	<0.01	0.05	0.00	288.88	1.04	
Mid-water paired & single Trawl	OPEN	MA	all	all	0.00	280.73	0.00	0.00	0.00	334.23	0.00	0.00	0.00	0.72	0.00	
Mid-water paired & single Trawl	OPEN	NE	all	all	0.57	1581.12	0.00	0.00	0.00	7.04	1.14	0.02	0.00	0.25	0.56	

Total Discards      82.96      3282.63      0.00      102.72      5891.47      1570.77      1590.87      906.57      985.43      4127.64      870.98

Table 5a *continued*. Total discards (with survival ratios applied; in live, mt),, by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)												
					HADDOCK	YELLOWTAIL FLOUNDER	AMERICAN PLAICE	WITCH FLOUNDER	WINTER FLOUNDER	POLLOCK	ACADIAN REDFISH	WHITE HAKE	WINDOWPANE FLOUNDER	ATLANTIC HALIBUT	OCEAN POUT	
Longline	HOOK	NE	all	all	30.72	0.00	<0.01	<0.01	0.00	<0.01	0.15	1.01	0.00	0.32	0.01	
Longline	OPEN	MA	all	all												
Longline	OPEN	NE	all	all	36.56	0.01	<0.01	0.00	0.00	0.20	0.37	1.09	<0.01	0.10	2.98	
Hand Line	OPEN	MA	all	all												
Hand Line	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Otter Trawl	B	MA	large	all												
Otter Trawl	B	NE	small	all												
Otter Trawl	B	NE	large	all	45.44	43.05	8.11	10.41	2.51	2.58	13.53	2.11	64.92	1.02	11.06	
Otter Trawl	OPEN	MA	small	all	4.25	8.40	1.91	32.87	25.90	0.02	1.13	23.35	53.83	0.00	0.03	
Otter Trawl	OPEN	MA	large	all	0.00	0.17	0.03	2.08	13.99	0.00	0.00	<0.01	83.96	0.00	0.00	
Otter Trawl	OPEN	NE	small	all	94.36	26.68	34.17	52.96	46.55	0.00	1.82	70.11	16.32	0.60	27.09	
Otter Trawl	OPEN	NE	large	all	20.33	249.58	191.84	99.73	118.88	6.64	34.42	6.92	158.40	4.62	65.71	
Otter Trawl	USCAN	MA	small	all												
Otter Trawl	USCAN	MA	large	all												
Otter Trawl	USCAN	NE	small	all	0.54	1.50	0.35	0.46	0.23	0.10	0.04	0.06	2.92	0.03	0.48	
Otter Trawl	USCAN	NE	large	all	240.26	110.38	37.19	35.62	13.44	8.23	23.21	5.80	299.74	2.82	43.23	
Scallop Trawl	CLOSED	MA	all	general												
Scallop Trawl	CLOSED	MA	all	limited												
Scallop Trawl	CLOSED	NE	all	limited												
Scallop Trawl	OPEN	MA	all	general	0.06	0.03	0.01	0.15	0.00	0.00	0.02	0.37	5.16	0.00	0.48	
Scallop Trawl	OPEN	MA	all	limited												
Scallop Trawl	OPEN	NE	all	general												
Scallop Trawl	OPEN	NE	all	limited												
Shrimp Trawl	OPEN	MA	all	all												
Shrimp Trawl	OPEN	NE	all	all	0.05	2.08	18.07	3.27	12.96	0.11	1.09	0.99	0.69	0.08	0.09	
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all												
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	3.15	11.84	1.22	1.34	4.19	33.83	2.11	10.99	0.02	0.79	0.64	
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	1.90	2.38	1.04	0.16	1.95	13.65	2.17	10.79	0.03	3.34	1.39	
Purse Seine	OPEN	MA	all	all												
Purse Seine	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Scallop Dredge	CLOSED	MA	all	general												
Scallop Dredge	CLOSED	MA	all	limited	0.03	0.05	0.04	16.89	0.69	0.00	0.00	0.03	0.13	0.00	0.16	
Scallop Dredge	CLOSED	NE	all	general	0.20	1.55	0.00	0.00	1.37	0.00	0.00	2.29	0.21	0.00	0.03	
Scallop Dredge	CLOSED	NE	all	limited	2.42	123.52	2.59	5.04	47.99	0.03	0.00	1.88	9.03	0.00	1.16	
Scallop Dredge	OPEN	MA	all	general	0.00	0.20	0.00	0.24	5.19	0.00	0.00	0.00	15.30	0.00	0.15	
Scallop Dredge	OPEN	MA	all	limited	0.00	0.95	1.26	14.72	3.95	0.00	0.30	0.29	14.73	0.01	1.39	
Scallop Dredge	OPEN	NE	all	general	0.00	4.79	0.11	0.00	9.61	0.00	0.00	0.00	12.16	0.00	0.61	
Scallop Dredge	OPEN	NE	all	limited	0.83	97.98	4.34	11.59	49.20	0.00	0.00	0.57	108.09	<0.01	0.46	
Mid-water paired & single Trawl	OPEN	MA	all	all	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	
Mid-water paired & single Trawl	OPEN	NE	all	all	58.60	<0.01	0.05	0.02	<0.01	5.16	3.86	0.44	0.00	0.00	0.00	

Total Discards 539.69 685.15 302.33 287.53 358.60 70.76 84.22 139.10 845.72 13.72 157.16

Table 5a *continued*. Total discards (with survival ratios applied; in live, mt), by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)												
					SILVER HAKE	OFFSHORE HAKE	RED HAKE	SKATES	SPINY DOGFISH	SUMMER FLOUNDER	SCUP	BLACK SEA BASS	ATLANTIC SURFCLAM	OCEAN QUAHOG	TILEFISH	
Longline	HOOK	NE	all	all	0.02	0.00	1.03	30.21	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Longline	OPEN	MA	all	all												
Longline	OPEN	NE	all	all	<0.01	0.00	0.80	103.30	38.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hand Line	OPEN	MA	all	all												
Hand Line	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Otter Trawl	B	MA	large	all												
Otter Trawl	B	NE	small	all												
Otter Trawl	B	NE	large	all	13.35	<0.01	12.77	3847.90	36.81	67.14	<0.01	<0.01	0.04	0.41	0.04	
Otter Trawl	OPEN	MA	small	all	812.24	9.45	798.02	1901.43	1047.67	206.41	86.17	64.70	2.04	0.05	2.34	
Otter Trawl	OPEN	MA	large	all	2.41	0.00	2.45	3745.42	499.97	67.48	375.44	5.04	0.45	0.07	0.00	
Otter Trawl	OPEN	NE	small	all	1841.12	0.00	597.52	704.51	430.36	108.33	14.78	1.43	0.00	0.05	24.36	
Otter Trawl	OPEN	NE	large	all	21.39	0.06	15.66	5090.18	1189.10	132.29	64.05	9.13	4.72	4.01	0.39	
Otter Trawl	USCAN	MA	small	all												
Otter Trawl	USCAN	MA	large	all												
Otter Trawl	USCAN	NE	small	all	0.15	0.00	0.28	60.70	2.81	1.24	<0.01	0.00	0.04	<0.01	<0.01	
Otter Trawl	USCAN	NE	large	all	14.44	0.08	37.48	8905.25	169.01	195.13	0.02	0.00	0.61	3.41	0.00	
Scallop Trawl	CLOSED	MA	all	general												
Scallop Trawl	CLOSED	MA	all	limited												
Scallop Trawl	CLOSED	NE	all	limited												
Scallop Trawl	OPEN	MA	all	general	0.94	0.00	0.18	204.81	5.45	0.42	<0.01	0.14	0.01	2.21	0.00	
Scallop Trawl	OPEN	MA	all	limited												
Scallop Trawl	OPEN	NE	all	general												
Scallop Trawl	OPEN	NE	all	limited												
Shrimp Trawl	OPEN	MA	all	all												
Shrimp Trawl	OPEN	NE	all	all	25.40	0.00	0.49	5.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	0.02	0.00	0.00	286.53	38.45	2.57	0.00	0.00	0.00	0.00	0.00	0.00
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all												
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	0.84	0.05	0.42	55.89	571.40	<0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	0.14	0.00	0.02	653.63	110.15	17.28	0.00	0.00	<0.01	0.00	3.22	
Purse Seine	OPEN	MA	all	all												
Purse Seine	OPEN	NE	all	all	0.00	0.00	0.00	0.01	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Scallop Dredge	CLOSED	MA	all	general												
Scallop Dredge	CLOSED	MA	all	limited	1.91	0.00	3.17	2529.27	9.76	110.30	1.02	1.62	0.00	0.16	0.00	
Scallop Dredge	CLOSED	NE	all	general	0.05	0.00	0.46	32.05	0.09	0.81	0.00	0.00	3.74	0.00	0.00	
Scallop Dredge	CLOSED	NE	all	limited	3.98	0.00	36.30	1194.02	6.33	13.66	0.00	0.00	0.20	1.18	0.00	
Scallop Dredge	OPEN	MA	all	general	0.18	0.00	0.29	1326.06	11.00	25.27	0.01	0.47	0.47	0.59	0.00	
Scallop Dredge	OPEN	MA	all	limited	5.25	0.00	3.43	3526.06	10.18	182.16	0.40	2.53	0.00	9.21	0.00	
Scallop Dredge	OPEN	NE	all	general	0.00	0.00	0.00	151.54	0.00	0.14	0.00	0.00	5.53	43.81	0.00	
Scallop Dredge	OPEN	NE	all	limited	5.03	0.00	17.89	1733.60	4.26	48.77	0.04	0.00	3.60	0.32	0.00	
Mid-water paired & single Trawl	OPEN	MA	all	all	0.00	0.00	0.00	0.00	79.23	0.00	5.49	0.00	0.00	0.00	0.00	0.00
Mid-water paired & single Trawl	OPEN	NE	all	all	10.12	0.00	0.42	0.02	96.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Total Discards 2759.00 9.64 1529.10 36088.40 4362.33 1179.41 547.43 85.07 21.43 65.47 30.34

Table 5b. Total discards (**without** survival ratios applied; in live, mt), by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Species										
					BLUEFISH	ATLANTIC HERRING	ATLANTIC SALMON	DEEP SEA RED CRAB	ATLANTIC SEA SCALLOP	ATLANTIC MACKEREL	ILLEX SQUID	LOLIGO SQUID	BUTTERFISH	MONKFISH	ATLANTIC COD
Longline	HOOK	NE	all	all	0.00	0.01	0.00	0.00	<0.01	0.00	0.00	0.00	0.00	<0.01	1.49
Longline	OPEN	MA	all	all											
Longline	OPEN	NE	all	all	0.00	0.00	0.00	0.00	<0.01	0.00	0.00	0.00	0.00	<0.01	45.94
Hand Line	OPEN	MA	all	all											
Hand Line	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.21
Otter Trawl	B	MA	large	all											
Otter Trawl	B	NE	small	all											
Otter Trawl	B	NE	large	all	0.67	5.67	0.00	6.05	14.04	0.09	1.07	0.25	<0.01	70.41	53.95
Otter Trawl	OPEN	MA	small	all	34.73	181.53	0.00	0.38	42.75	212.40	1389.30	590.43	664.19	163.39	0.10
Otter Trawl	OPEN	MA	large	all	7.70	0.00	0.00	1.91	13.96	0.06	0.18	0.66	3.78	29.81	0.00
Otter Trawl	OPEN	NE	small	all	1.78	252.46	0.00	22.54	3.56	983.48	189.95	309.12	315.46	165.61	44.24
Otter Trawl	OPEN	NE	large	all	6.21	4.30	0.00	41.67	15.32	0.86	6.11	1.98	0.59	368.38	304.43
Otter Trawl	USCAN	MA	small	all											
Otter Trawl	USCAN	MA	large	all											
Otter Trawl	USCAN	NE	small	all	0.01	<0.01	0.00	0.12	0.02	<0.01	<0.01	<0.01	<0.01	0.94	1.54
Otter Trawl	USCAN	NE	large	all	5.44	2.52	0.00	28.07	32.30	0.32	1.20	0.63	0.13	144.57	264.52
Scallop Trawl	CLOSED	MA	all	general											
Scallop Trawl	CLOSED	MA	all	limited											
Scallop Trawl	CLOSED	NE	all	limited											
Scallop Trawl	OPEN	MA	all	general	0.00	0.02	0.00	0.00	450.22	0.00	0.09	0.44	0.05	60.26	0.00
Scallop Trawl	OPEN	MA	all	limited											
Scallop Trawl	OPEN	NE	all	general											
Scallop Trawl	OPEN	NE	all	limited											
Shrimp Trawl	OPEN	MA	all	all											
Shrimp Trawl	OPEN	NE	all	all	0.00	9.08	0.00	0.76	0.10	2.76	0.31	0.00	1.13	3.49	2.65
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	4.96	0.00	0.00	0.00	1.81	1.75	0.00	0.00	0.00	223.09	0.29
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	6.01	4.75	0.00	0.78	<0.01	0.74	0.00	0.00	0.00	4.42	91.78
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	14.28	0.35	0.00	0.30	0.26	25.37	0.00	0.00	0.00	389.49	33.65
Purse Seine	OPEN	MA	all	all											
Purse Seine	OPEN	NE	all	all	0.60	960.05	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
Scallop Dredge	CLOSED	MA	all	general											
Scallop Dredge	CLOSED	MA	all	limited	0.00	0.00	0.00	0.14	790.91	0.09	1.20	1.48	0.01	767.25	0.00
Scallop Dredge	CLOSED	NE	all	general	0.00	0.00	0.00	0.00	124.85	0.00	0.00	0.00	0.00	32.12	0.00
Scallop Dredge	CLOSED	NE	all	limited	0.00	0.00	0.00	0.00	673.30	0.00	<0.01	0.01	<0.01	370.09	1.55
Scallop Dredge	OPEN	MA	all	general	0.00	0.00	0.00	0.00	105.69	0.00	<0.01	0.56	0.00	110.74	0.00
Scallop Dredge	OPEN	MA	all	limited	0.00	0.03	0.00	0.00	2024.29	1.26	0.32	0.94	0.08	933.29	0.00
Scallop Dredge	OPEN	NE	all	general	0.00	0.00	0.00	0.00	499.72	0.00	0.00	0.00	0.00	0.47	0.04
Scallop Dredge	OPEN	NE	all	limited	0.00	0.00	0.00	0.00	1098.35	0.07	<0.01	0.05	0.00	288.88	1.04
Mid-water paired & single Trawl	OPEN	MA	all	all	0.00	280.73	0.00	0.00	0.00	334.23	0.00	0.00	0.00	0.72	0.00
Mid-water paired & single Trawl	OPEN	NE	all	all	0.57	1581.12	0.00	0.00	0.00	7.04	1.14	0.02	0.00	0.25	0.56
Total Discards					82.96	3282.63	0.00	102.72	5891.47	1570.77	1590.87	906.57	985.43	4127.64	870.98

Table 5b *continued*. Total discards (**without** survival ratios applied; in live, mt), by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)												
					HADDOCK	YELLOWTAIL FLOUNDER	AMERICAN PLAICE	WITCH FLOUNDER	WINTER FLOUNDER	POLLOCK	ACADIAN REDFISH	WHITE HAKE	WINDOWPANE FLOUNDER	ATLANTIC HALIBUT	OCEAN POUT	
Longline	HOOK	NE	all	all	30.72	0.00	<0.01	<0.01	0.00	<0.01	0.15	1.01	0.00	0.32	0.01	
Longline	OPEN	MA	all	all												
Longline	OPEN	NE	all	all	36.56	0.01	<0.01	0.00	0.00	0.20	0.37	1.09	<0.01	0.10	2.98	
Hand Line	OPEN	MA	all	all												
Hand Line	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Otter Trawl	B	MA	large	all												
Otter Trawl	B	NE	small	all												
Otter Trawl	B	NE	large	all	45.44	43.05	8.11	10.41	2.51	2.58	13.53	2.11	64.92	1.02	11.06	
Otter Trawl	OPEN	MA	small	all	4.25	8.40	1.91	32.87	25.90	0.02	1.13	23.35	53.83	0.00	0.03	
Otter Trawl	OPEN	MA	large	all	0.00	0.17	0.03	2.08	13.99	0.00	0.00	<0.01	83.96	0.00	0.00	
Otter Trawl	OPEN	NE	small	all	94.36	26.68	34.17	52.96	46.55	0.00	1.82	70.11	16.32	0.60	27.09	
Otter Trawl	OPEN	NE	large	all	20.33	249.58	191.84	99.73	118.88	6.64	34.42	6.92	158.40	4.62	65.71	
Otter Trawl	USCAN	MA	small	all												
Otter Trawl	USCAN	MA	large	all												
Otter Trawl	USCAN	NE	small	all	0.54	1.50	0.35	0.46	0.23	0.10	0.04	0.06	2.92	0.03	0.48	
Otter Trawl	USCAN	NE	large	all	240.26	110.38	37.19	35.62	13.44	8.23	23.21	5.80	299.74	2.82	43.23	
Scallop Trawl	CLOSED	MA	all	general												
Scallop Trawl	CLOSED	MA	all	limited												
Scallop Trawl	CLOSED	NE	all	limited												
Scallop Trawl	OPEN	MA	all	general	0.06	0.03	0.01	0.15	0.00	0.00	0.02	0.37	5.16	0.00	0.48	
Scallop Trawl	OPEN	MA	all	limited												
Scallop Trawl	OPEN	NE	all	general												
Scallop Trawl	OPEN	NE	all	limited												
Shrimp Trawl	OPEN	MA	all	all												
Shrimp Trawl	OPEN	NE	all	all	0.05	2.08	18.07	3.27	12.96	0.11	1.09	0.99	0.69	0.08	0.09	
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all												
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all												
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	3.15	11.84	1.22	1.34	4.19	33.83	2.11	10.99	0.02	0.79	0.64	
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	1.90	2.38	1.04	0.16	1.95	13.65	2.17	10.79	0.03	3.34	1.39	
Purse Seine	OPEN	MA	all	all												
Purse Seine	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Scallop Dredge	CLOSED	MA	all	general												
Scallop Dredge	CLOSED	MA	all	limited	0.03	0.05	0.04	16.89	0.69	0.00	0.00	0.03	0.13	0.00	0.16	
Scallop Dredge	CLOSED	NE	all	general	0.20	1.55	0.00	0.00	1.37	0.00	0.00	2.29	0.21	0.00	0.03	
Scallop Dredge	CLOSED	NE	all	limited	2.42	123.52	2.59	5.04	47.99	0.03	0.00	1.88	9.03	0.00	1.16	
Scallop Dredge	OPEN	MA	all	general	0.00	0.20	0.00	0.24	5.19	0.00	0.00	0.00	15.30	0.00	0.15	
Scallop Dredge	OPEN	MA	all	limited	0.00	0.95	1.26	14.72	3.95	0.00	0.30	0.29	14.73	0.01	1.39	
Scallop Dredge	OPEN	NE	all	general	0.00	4.79	0.11	0.00	9.61	0.00	0.00	0.00	12.16	0.00	0.61	
Scallop Dredge	OPEN	NE	all	limited	0.83	97.98	4.34	11.59	49.20	0.00	0.00	0.57	108.09	<0.01	0.46	
Mid-water paired & single Trawl	OPEN	MA	all	all	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	
Mid-water paired & single Trawl	OPEN	NE	all	all	58.60	<0.01	0.05	0.02	<0.01	5.16	3.86	0.44	0.00	0.00	0.00	

Total Discards 539.69 685.15 302.33 287.53 358.60 70.76 84.22 139.10 845.72 13.72 157.16

Table 5b *continued*. Total discards (**without** survival ratios applied; in live, mt), by species and fleet in 2005.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)											
					SILVER HAKE	OFFSHORE HAKE	RED HAKE	SKATES	SPINY DOGFISH	SUMMER FLounder	SCUP	BLACK SEA BASS	ATLANTIC SURFCLAM	OCEAN QUAHOG	TILEFISH
Longline	HOOK	NE	all	all	0.02	0.00	1.03	30.21	10.98	0.00	0.00	0.00	0.00	0.00	0.00
Longline	OPEN	MA	all	all											
Longline	OPEN	NE	all	all	<0.01	0.00	0.80	103.30	153.57	0.00	0.00	0.00	0.00	0.00	0.00
Hand Line	OPEN	MA	all	all											
Hand Line	OPEN	NE	all	all	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Otter Trawl	B	MA	large	all											
Otter Trawl	B	NE	small	all											
Otter Trawl	B	NE	large	all	13.35	<0.01	12.77	3847.90	73.62	83.93	<0.01	<0.01	0.04	0.41	0.04
Otter Trawl	OPEN	MA	small	all	812.24	9.45	798.02	1901.43	2095.35	258.01	86.17	64.70	2.04	0.05	2.34
Otter Trawl	OPEN	MA	large	all	2.41	0.00	2.45	3745.42	999.93	84.35	375.44	5.04	0.45	0.07	0.00
Otter Trawl	OPEN	NE	small	all	1841.12	0.00	597.52	704.51	860.72	135.41	14.78	1.43	0.00	0.05	24.36
Otter Trawl	OPEN	NE	large	all	21.39	0.06	15.66	5090.18	2378.20	165.37	64.05	9.13	4.72	4.01	0.39
Otter Trawl	USCAN	MA	small	all											
Otter Trawl	USCAN	MA	large	all											
Otter Trawl	USCAN	NE	small	all	0.15	0.00	0.28	60.70	5.61	1.55	<0.01	0.00	0.04	<0.01	<0.01
Otter Trawl	USCAN	NE	large	all	14.44	0.08	37.48	8905.25	338.01	243.91	0.02	0.00	0.61	3.41	0.00
Scallop Trawl	CLOSED	MA	all	general											
Scallop Trawl	CLOSED	MA	all	limited											
Scallop Trawl	CLOSED	NE	all	limited											
Scallop Trawl	OPEN	MA	all	general	0.94	0.00	0.18	204.81	10.89	0.53	<0.01	0.14	0.01	2.21	0.00
Scallop Trawl	OPEN	MA	all	limited											
Scallop Trawl	OPEN	NE	all	general											
Scallop Trawl	OPEN	NE	all	limited											
Shrimp Trawl	OPEN	MA	all	all											
Shrimp Trawl	OPEN	NE	all	all	25.40	0.00	0.49	5.99	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	0.02	0.00	0.00	286.53	128.16	3.21	0.00	0.00	0.00	0.00	0.00
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	0.84	0.05	0.42	55.89	1904.67	<0.01	0.00	0.00	0.00	0.00	0.00
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	0.14	0.00	0.02	653.63	367.16	21.60	0.00	0.00	<0.01	0.00	3.22
Purse Seine	OPEN	MA	all	all											
Purse Seine	OPEN	NE	all	all	0.00	0.00	0.00	0.01	4.44	0.00	0.00	0.00	0.00	0.00	0.00
Scallop Dredge	CLOSED	MA	all	general											
Scallop Dredge	CLOSED	MA	all	limited	1.91	0.00	3.17	2529.27	13.01	137.87	1.02	1.62	0.00	0.16	0.00
Scallop Dredge	CLOSED	NE	all	general	0.05	0.00	0.46	32.05	0.11	1.01	0.00	0.00	3.74	0.00	0.00
Scallop Dredge	CLOSED	NE	all	limited	3.98	0.00	36.30	1194.02	8.45	17.08	0.00	0.00	0.20	1.18	0.00
Scallop Dredge	OPEN	MA	all	general	0.18	0.00	0.29	1326.06	14.66	31.58	0.01	0.47	0.47	0.59	0.00
Scallop Dredge	OPEN	MA	all	limited	5.25	0.00	3.43	3526.06	13.57	227.70	0.40	2.53	0.00	9.21	0.00
Scallop Dredge	OPEN	NE	all	general	0.00	0.00	0.00	151.54	0.00	0.18	0.00	0.00	5.53	43.81	0.00
Scallop Dredge	OPEN	NE	all	limited	5.03	0.00	17.89	1733.60	5.67	60.96	0.04	0.00	3.60	0.32	0.00
Mid-water paired & single Trawl	OPEN	MA	all	all	0.00	0.00	0.00	0.00	158.45	0.00	5.49	0.00	0.00	0.00	0.00
Mid-water paired & single Trawl	OPEN	NE	all	all	10.12	0.00	0.42	0.02	193.92	0.00	0.00	0.00	0.00	0.00	0.00

Total Discards      2759.00      9.64      1529.10      36088.40      9739.19      1474.26      547.43      85.07      21.43      65.47      30.34

Table 6. Precision (CV) of total discard weight.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Precision (CV) of total discard weight by species										
					BLUEFISH	ATLANTIC HERRING	ATLANTIC SALMON	DEEP SEA RED CRAB	ATLANTIC SEA SCALLOP	ATLANTIC MACKEREL	ILLEX SQUID	LOLIGO SQUID	BUTTERFISH	MONKFISH	ATLANTIC COD
Longline	HOOK	NE	all	all	*	0.876	*	*	0.883	*	*	*	*	0.874	0.108
Longline	OPEN	MA	all	all	*	*	*	*	0.688	*	*	*	*	0.827	0.267
Longline	OPEN	NE	all	all	*	*	*	*	0.688	*	*	*	*	0.827	0.267
Hand Line	OPEN	MA	all	all											
Hand Line	OPEN	NE	all	all	*	*	*	*	*	*	*	*	*	*	0.423
Otter Trawl	B	MA	large	all											
Otter Trawl	B	NE	small	all											
Otter Trawl	B	NE	large	all	0.331	0.401	*	0.193	0.317	0.329	0.222	0.358	0.268	0.114	0.222
Otter Trawl	OPEN	MA	small	all	0.420	0.528	*	0.618	0.365	0.636	0.412	0.265	0.295	0.193	0.543
Otter Trawl	OPEN	MA	large	all	1.074	*	*	0.729	0.834	0.709	1.290	0.595	0.982	0.520	*
Otter Trawl	OPEN	NE	small	all	0.402	1.034	*	0.805	0.670	0.571	0.316	0.338	0.414	0.180	0.583
Otter Trawl	OPEN	NE	large	all	0.541	0.294	*	0.315	0.255	0.450	0.303	0.469	0.263	0.162	0.203
Otter Trawl	USCAN	MA	small	all											
Otter Trawl	USCAN	MA	large	all											
Otter Trawl	USCAN	NE	small	all	1.150	0.149	*	0.181	0.193	0.142	0.172	0.342	0.180	0.080	0.126
Otter Trawl	USCAN	NE	large	all	0.258	0.242	*	0.135	0.196	0.186	0.215	0.229	0.690	0.071	0.115
Scallop Trawl	CLOSED	MA	all	general											
Scallop Trawl	CLOSED	MA	all	limited											
Scallop Trawl	CLOSED	NE	all	limited											
Scallop Trawl	OPEN	MA	all	general	*	1.001	*	*	0.135	*	0.478	0.405	0.523	0.107	*
Scallop Trawl	OPEN	MA	all	limited											
Scallop Trawl	OPEN	NE	all	general											
Scallop Trawl	OPEN	NE	all	limited											
Shrimp Trawl	OPEN	MA	all	all											
Shrimp Trawl	OPEN	NE	all	all	*	0.325	*	1.120	0.727	0.547	1.120	*	0.593	1.021	0.362
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	0.330	*	*	*	0.555	0.735	*	*	*	0.309	0.675
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	0.419	0.400	*	0.446	0.434	0.484	*	*	*	0.255	0.116
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	0.255	0.337	*	0.501	0.394	0.660	*	*	*	0.191	0.174
Purse Seine	OPEN	MA	all	all											
Purse Seine	OPEN	NE	all	all	1.110	0.616	*	*	*	0.995	*	*	*	*	*
Scallop Dredge	CLOSED	MA	all	general											
Scallop Dredge	CLOSED	MA	all	limited	*	*	*	0.578	0.228	0.473	0.497	0.387	0.520	0.108	*
Scallop Dredge	CLOSED	NE	all	general	*	*	*	*	0.171	*	*	*	*	0.179	*
Scallop Dredge	CLOSED	NE	all	limited	*	*	*	*	0.303	*	1.071	0.866	0.540	0.193	0.268
Scallop Dredge	OPEN	MA	all	general	*	*	*	*	0.352	*	1.046	0.435	*	0.182	*
Scallop Dredge	OPEN	MA	all	limited	*	0.973	*	*	0.375	1.127	0.641	0.389	0.699	0.224	*
Scallop Dredge	OPEN	NE	all	general	*	*	*	*	0.319	*	*	*	*	0.542	0.778
Scallop Dredge	OPEN	NE	all	limited	*	*	*	*	0.503	1.141	0.874	0.623	*	0.336	1.014
Mid-water paired & single Trawl	OPEN	MA	all	all	*	0.688	*	*	*	0.832	*	*	*	0.863	*
Mid-water paired & single Trawl	OPEN	NE	all	all	0.480	0.493	*	*	*	0.813	0.517	0.582	*	0.468	0.486

Note: \* = CV is null (bycatch ratio = 0); blank = little or no observer coverage

Table 6 *continued*. Precision (CV) of total discard weight.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	HADDOCK	YELLOWTAIL FLOUNDER	AMERICAN PLAICE	WITCH FLOUNDER	WINTER FLOUNDER	POLLOCK	ACADIAN REDFISH	WHITE HAKE	WINDOWPANE FLOUNDER	ATLANTIC HALIBUT	OCEAN POUT
Longline	HOOK	NE	all	all	0.077	*	0.599	0.885	*	0.697	0.226	0.180	*	0.308	0.680
Longline	OPEN	MA	all	all											
Longline	OPEN	NE	all	all	0.169	0.693	0.648	*	*	0.577	0.254	0.231	0.748	0.362	0.325
Hand Line	OPEN	MA	all	all											
Hand Line	OPEN	NE	all	all	*	*	*	*	*	*	*	*	*	*	*
Otter Trawl	B	MA	large	all											
Otter Trawl	B	NE	small	all											
Otter Trawl	B	NE	large	all	0.154	0.182	0.108	0.101	0.220	0.380	0.295	0.172	0.127	0.229	0.141
Otter Trawl	OPEN	MA	small	all	0.596	0.581	0.612	0.276	0.824	0.626	0.349	0.455	0.402	*	0.433
Otter Trawl	OPEN	MA	large	all	*	1.122	1.365	0.727	0.907	*	*	1.411	0.871	*	*
Otter Trawl	OPEN	NE	small	all	0.520	0.416	0.454	0.281	0.467	*	0.506	0.848	0.527	0.606	0.676
Otter Trawl	OPEN	NE	large	all	0.223	0.135	0.131	0.123	0.180	0.309	0.230	0.342	0.287	0.253	0.202
Otter Trawl	USCAN	MA	small	all											
Otter Trawl	USCAN	MA	large	all											
Otter Trawl	USCAN	NE	small	all	0.107	0.116	0.115	0.135	0.124	0.404	0.145	0.148	0.146	0.144	0.088
Otter Trawl	USCAN	NE	large	all	0.108	0.097	0.100	0.076	0.302	0.317	0.140	0.196	0.100	0.122	0.109
Scallop Trawl	CLOSED	MA	all	general											
Scallop Trawl	CLOSED	MA	all	limited											
Scallop Trawl	CLOSED	NE	all	limited											
Scallop Trawl	OPEN	MA	all	general	0.593	0.568	0.959	0.413	*	*	1.006	0.531	0.297	*	0.423
Scallop Trawl	OPEN	MA	all	limited											
Scallop Trawl	OPEN	NE	all	general											
Scallop Trawl	OPEN	NE	all	limited											
Shrimp Trawl	OPEN	MA	all	all											
Shrimp Trawl	OPEN	NE	all	all	0.565	0.310	0.187	0.783	0.403	0.688	1.074	0.473	0.310	0.953	0.795
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	*	*	*	*	*	*	*	*	1.000	*	*
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	0.359	0.578	0.258	0.704	0.622	0.115	0.203	0.242	0.460	1.500	1.111
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	0.227	0.869	0.527	0.533	0.759	0.195	0.782	0.315	0.510	0.388	0.804
Purse Seine	OPEN	MA	all	all											
Purse Seine	OPEN	NE	all	all	*	*	*	*	*	*	*	*	*	*	*
Scallop Dredge	CLOSED	MA	all	general											
Scallop Dredge	CLOSED	MA	all	limited	0.828	0.445	0.717	0.163	1.090	*	*	0.714	0.602	*	0.538
Scallop Dredge	CLOSED	NE	all	general	0.557	0.159	*	*	0.793	*	*	0.176	1.050	*	0.872
Scallop Dredge	CLOSED	NE	all	limited	0.255	0.250	0.325	0.289	0.214	1.041	*	0.417	0.400	*	0.252
Scallop Dredge	OPEN	MA	all	general	*	0.575	*	0.648	0.443	*	*	*	0.204	*	0.653
Scallop Dredge	OPEN	MA	all	limited	*	0.655	0.755	0.450	0.468	*	0.824	0.938	0.350	1.078	0.615
Scallop Dredge	OPEN	NE	all	general	*	0.523	0.673	*	0.431	*	*	*	0.473	*	0.789
Scallop Dredge	OPEN	NE	all	limited	0.943	0.348	0.862	0.720	0.283	*	*	1.089	0.656	1.363	0.614
Mid-water paired & single Trawl	OPEN	MA	all	all	*	*	*	*	*	0.864	*	*	*	*	*
Mid-water paired & single Trawl	OPEN	NE	all	all	0.510	0.900	0.366	0.376	0.811	0.582	0.886	0.793	*	*	*

Note: \* = CV is null (bycatch ratio = 0); blank = little or no observer coverage

Table 6 *continued*. Precision (CV) of total discard weight.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)											
					SILVER HAKE	OFFSHORE HAKE	RED HAKE	SKATES	SPINY DOGFISH	SUMMER FLOUNDER	SCUP	BLACK SEA BASS	ATLANTIC SURFCLAM	OCEAN QUAHOG	TILEFISH
Longline	HOOK	NE	all	all	0.785	*	0.196	0.114	0.335	*	*	*	*	*	*
Longline	OPEN	MA	all	all											
Longline	OPEN	NE	all	all	0.550	*	0.274	0.196	0.210	*	*	*	*	*	*
Hand Line	OPEN	MA	all	all											
Hand Line	OPEN	NE	all	all	*	*	*	*	*	*	*	*	*	*	*
Otter Trawl	B	MA	large	all											
Otter Trawl	B	NE	small	all											
Otter Trawl	B	NE	large	all	0.278	0.619	0.188	0.107	0.296	0.153	0.631	0.620	0.850	0.581	0.526
Otter Trawl	OPEN	MA	small	all	0.286	0.624	0.266	0.314	0.269	0.259	0.333	0.348	1.954	0.886	0.418
Otter Trawl	OPEN	MA	large	all	1.157	*	1.074	1.009	0.609	0.623	0.746	0.678	0.740	0.810	*
Otter Trawl	OPEN	NE	small	all	0.274	*	0.202	0.284	0.252	0.389	0.433	0.322	*	1.522	0.900
Otter Trawl	OPEN	NE	large	all	0.210	0.650	0.166	0.113	0.158	0.305	0.812	0.522	1.408	1.198	1.294
Otter Trawl	USCAN	MA	small	all											
Otter Trawl	USCAN	MA	large	all											
Otter Trawl	USCAN	NE	small	all	0.399	*	0.529	0.056	0.687	0.141	0.287	*	0.178	0.164	0.417
Otter Trawl	USCAN	NE	large	all	0.242	0.652	0.217	0.049	0.220	0.098	0.714	*	0.288	0.187	*
Scallop Trawl	CLOSED	MA	all	general											
Scallop Trawl	CLOSED	MA	all	limited											
Scallop Trawl	CLOSED	NE	all	limited											
Scallop Trawl	OPEN	MA	all	general	0.376	*	0.511	0.112	0.616	0.556	1.142	0.484	0.959	0.737	*
Scallop Trawl	OPEN	MA	all	limited											
Scallop Trawl	OPEN	NE	all	general											
Scallop Trawl	OPEN	NE	all	limited											
Shrimp Trawl	OPEN	MA	all	all											
Shrimp Trawl	OPEN	NE	all	all	0.270	*	0.551	0.194	0.573	*	*	*	*	*	*
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all											
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	1.104	*	*	0.454	0.307	0.341	*	*	*	*	*
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all											
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	0.243	0.427	0.367	0.592	0.119	0.908	*	*	*	*	*
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	0.290	*	0.622	0.435	0.175	0.264	*	*	*	0.931	*
Purse Seine	OPEN	MA	all	all											
Purse Seine	OPEN	NE	all	all	*	*	*	1.155	0.467	*	*	*	*	*	*
Scallop Dredge	CLOSED	MA	all	general											
Scallop Dredge	CLOSED	MA	all	limited	0.212	*	0.358	0.128	0.323	0.174	0.410	0.275	*	0.721	*
Scallop Dredge	CLOSED	NE	all	general	0.565	*	0.514	0.087	1.066	1.077	*	*	0.184	*	*
Scallop Dredge	CLOSED	NE	all	limited	0.312	*	0.263	0.100	0.340	0.224	*	*	0.797	0.540	*
Scallop Dredge	OPEN	MA	all	general	0.642	*	0.928	0.109	0.313	0.209	0.831	0.362	0.693	0.919	*
Scallop Dredge	OPEN	MA	all	limited	0.464	*	0.488	0.132	0.293	0.220	0.614	0.689	*	0.723	*
Scallop Dredge	OPEN	NE	all	general	*	*	*	0.382	*	0.781	*	*	0.778	0.734	*
Scallop Dredge	OPEN	NE	all	limited	0.692	*	0.591	0.202	0.381	0.434	0.756	*	1.363	0.756	*
Mid-water paired & single Trawl	OPEN	MA	all	all	*	*	*	*	0.414	*	0.819	*	*	*	*
Mid-water paired & single Trawl	OPEN	NE	all	all	0.659	*	0.724	0.937	0.451	*	*	*	*	*	*

Note: \* = CV is null (bycatch ratio = 0); blank = little or no observer coverage

Table 7. VTR landings, Dealer landings and estimated landings for 2005 based on NEFOP data with associated coefficient of variation, and 95% confidence intervals of estimated landings. Landings in live mt.

Species	VTR Landings	Dealer Landings	Estimated Landings	CV	CI-Lower	CI-Upper	
American plaice	1,303	1,350	1,416	0.145	1,014	1,818	
Bluefish	1,450	2,975	2,009	0.028	1,898	2,120	
Blk Sea Bass	1,069	1,310	699	0.209	413	985	
Butterfish	310	437	187	0.244	98	277	
*	Surf clam	112,820	140,865	14,916	1.195	0	49,852
Cod	5,130	6,311	6,289	0.047	5,708	6,871	
Dogfish	814	1,127	1,332	0.226	741	1,924	
Fluke	7,157	7,826	7,249	0.155	5,052	9,446	
Haddock	6,234	7,581	6,170	0.044	5,633	6,708	
Halibut	7	17	20	0.204	12	28	
Herring	96,735	96,788	107,601	0.066	93,646	121,555	
Illex	10,900	12,032	5,198	0.446	654	9,743	
**	Loligo	16,465	16,983	21,150	0.117	16,307	25,993
Mackerel	44,427	42,209	31,018	0.232	16,909	45,126	
Monkfish	13,230	19,026	17,097	0.034	15,951	18,243	
**	Offshore Hake	225	14	0	0.518	0	0
Ocean pout	5	4	1	1.222	0	3	
Pollock	5,398	6,509	4,890	0.095	3,979	5,801	
*	Ocean quahog	115,112	113,792	203,214	0.091	167,040	239,387
*	Red crab	1,657	2,014	0	0.366	0	0
Redfish	494	564	433	0.153	303	562	
**	Red hake	558	430	125	0.251	63	186
Scallop	210,984	214,010	212,442	0.016	205,732	219,151	
Scup	2,899	4,268	2,079	0.349	655	3,502	
Silver Hake	7,666	7,498	7,012	0.221	3,980	10,044	
Skate Complex	11,733	14,080	14,991	0.119	11,505	18,476	
Tilefish	759	676	512	0.230	281	743	
**	White hake	1,280	2,670	1,869	0.152	1,313	2,425
Windowpane	82	89	135	0.511	0	271	
Winter fld	3,477	3,667	3,186	0.093	2,606	3,767	
Witch fld	2,545	2,652	2,663	0.084	2,226	3,101	
Yellowtail fld	3,947	4,118	3,784	0.061	3,330	4,238	
All species	717,052		700,277				
Total of single species	686,870	733,890	679,688				
Fluke-Scup-BSB	11,125	13,404	10,026	0.145	7,174	12,878	
Groundfish-large mesh	29,900	35,531	30,858	0.029	29,117	32,600	
Groundfish-small mesh	8,449	7,941	7,137	0.218	4,093	10,180	
Squid-butterfish-mack	72,104	71,661	57,556	0.130	42,913	72,199	
Clams and quahogs	227,932	254,657	218,130	0.016	211,433	224,827	
Squids (Illex and Loligo)	27,365	29,015	26,348				

\* these species have gear-specific, directed fisheries that were not observed in 2005.

\*\* potential 'mixed' species: squid unknown and red, offshore and white hake mix.

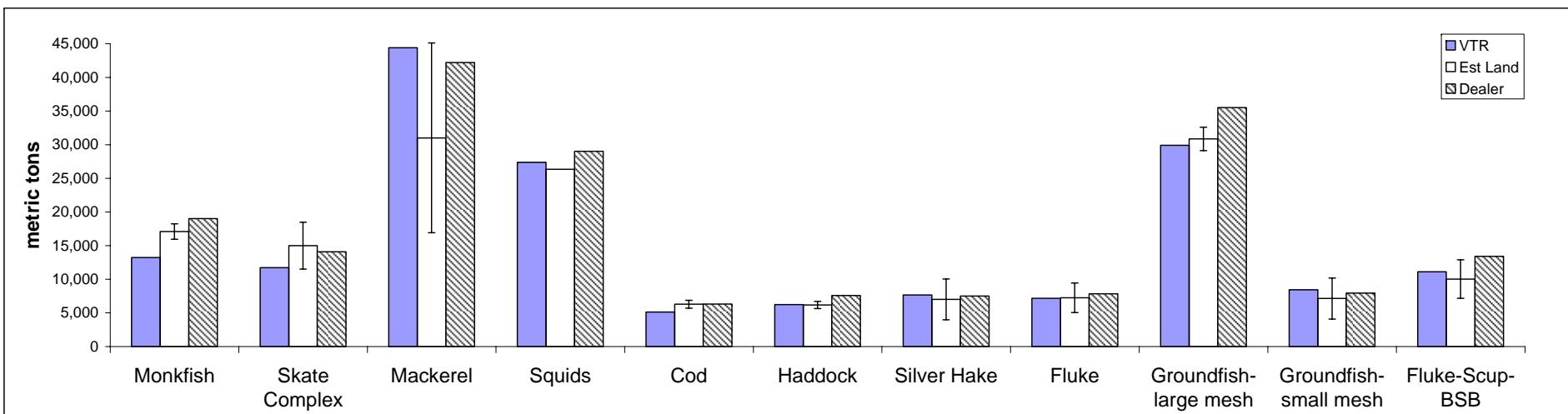
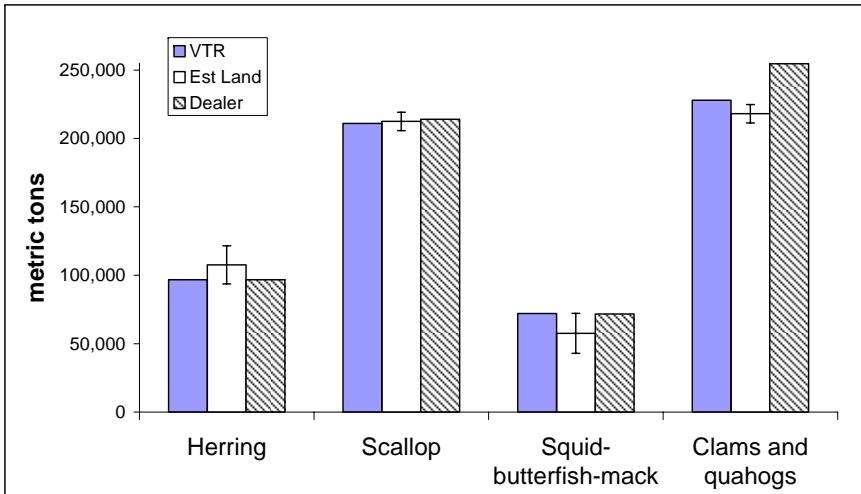


Figure 1. VTR landings (solid shaded bar), estimated landings (open bar) based on NEFOP data, and Dealer landings (hatched bar) in 2005, by species/species group.

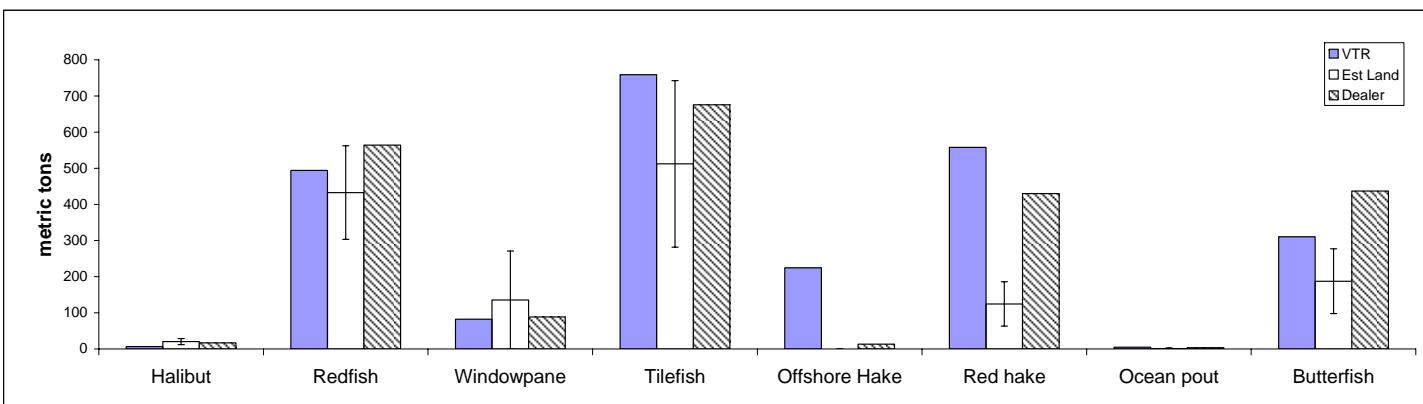
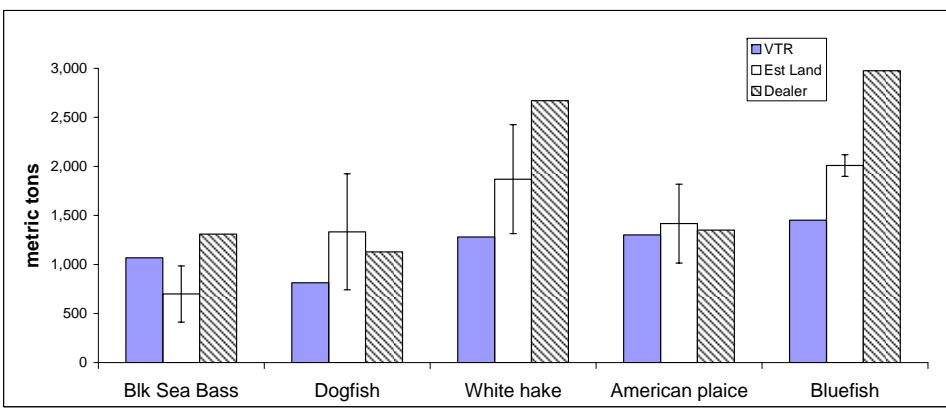
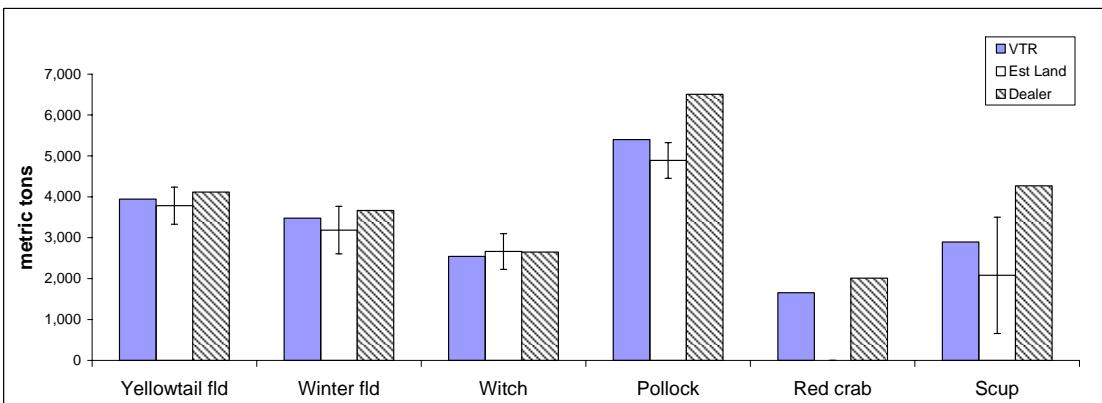


Figure 1 continued. VTR landings (shaded bar), estimated landings (open bar) based on NEFOP data, and Dealer landings (hatched bar) in 2005, by species/ species group.

Appendix Table 1. Survival ratios for spiny dogfish and summer flounder, by fleet.

Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)		
						SPINY DOGFISH	SUMMER FLOUNDER
Longline	HOOK	NE	all	all	010	0.75	0.20
Longline	OPEN	MA	all	all	010	0.75	0.20
Longline	OPEN	NE	all	all	010	0.75	0.20
Hand Line	OPEN	MA	all	all	020	0.90	0.20
Hand Line	OPEN	NE	all	all	020	0.90	0.20
Harpoon	OPEN	MA	all	all	030	0.00	0.20
Harpoon	OPEN	NE	all	all	030	0.00	0.20
Longline, Pelagic	OPEN	MA	all	all	040	0.75	0.20
Longline, Pelagic	OPEN	NE	all	all	040	0.75	0.20
Otter Trawl	B	MA	large	all	050	0.50	0.20
Otter Trawl	B	NE	small	all	050	0.50	0.20
Otter Trawl	B	NE	large	all	050	0.50	0.20
Otter Trawl	OPEN	MA	small	all	050	0.50	0.20
Otter Trawl	OPEN	MA	large	all	050	0.50	0.20
Otter Trawl	OPEN	NE	small	all	050	0.50	0.20
Otter Trawl	OPEN	NE	large	all	050	0.50	0.20
Otter Trawl	USCAN	MA	small	all	050	0.50	0.20
Otter Trawl	USCAN	MA	large	all	050	0.50	0.20
Otter Trawl	USCAN	NE	small	all	050	0.50	0.20
Otter Trawl	USCAN	NE	large	all	050	0.50	0.20
Scallop Trawl	CLOSED	MA	all	general	052	0.50	0.20
Scallop Trawl	CLOSED	MA	all	limited	052	0.50	0.20
Scallop Trawl	CLOSED	NE	all	limited	052	0.50	0.20
Scallop Trawl	OPEN	MA	all	general	052	0.50	0.20
Scallop Trawl	OPEN	MA	all	limited	052	0.50	0.20
Scallop Trawl	OPEN	NE	all	general	052	0.50	0.20
Scallop Trawl	OPEN	NE	all	limited	052	0.50	0.20
Shrimp Trawl	OPEN	MA	all	all	058	0.50	0.20
Shrimp Trawl	OPEN	NE	all	all	058	0.50	0.20
Sink, Anchor, Drift Gillnet	OPEN	MA	small	all	100, 110	0.70	0.20
Sink, Anchor, Drift Gillnet	OPEN	MA	large	all	100, 110	0.70	0.20
Sink, Anchor, Drift Gillnet	OPEN	MA	xlg	all	100, 110	0.70	0.20
Sink, Anchor, Drift Gillnet	OPEN	NE	small	all	100, 110	0.70	0.20
Sink, Anchor, Drift Gillnet	OPEN	NE	large	all	100, 110	0.70	0.20
Sink, Anchor, Drift Gillnet	OPEN	NE	xlg	all	100, 110	0.70	0.20
Purse Seine	OPEN	MA	all	all	121, 120	0.50	0.20
Purse Seine	OPEN	NE	all	all	121, 120	0.50	0.20
Scallop Dredge	CLOSED	MA	all	general	132	0.25	0.20
Scallop Dredge	CLOSED	MA	all	limited	132	0.25	0.20
Scallop Dredge	CLOSED	NE	all	general	132	0.25	0.20
Scallop Dredge	CLOSED	NE	all	limited	132	0.25	0.20
Scallop Dredge	OPEN	MA	all	general	132	0.25	0.20
Scallop Dredge	OPEN	MA	all	limited	132	0.25	0.20
Scallop Dredge	OPEN	NE	all	general	132	0.25	0.20
Scallop Dredge	OPEN	NE	all	limited	132	0.25	0.20
Mid-water paired & single Trawl	OPEN	MA	all	all	170, 370	0.50	0.20
Mid-water paired & single Trawl	OPEN	NE	all	all	170, 370	0.50	0.20

Appendix Table 1 *continued*. Survival ratios for spiny dogfish and summer flounder, by fleet.

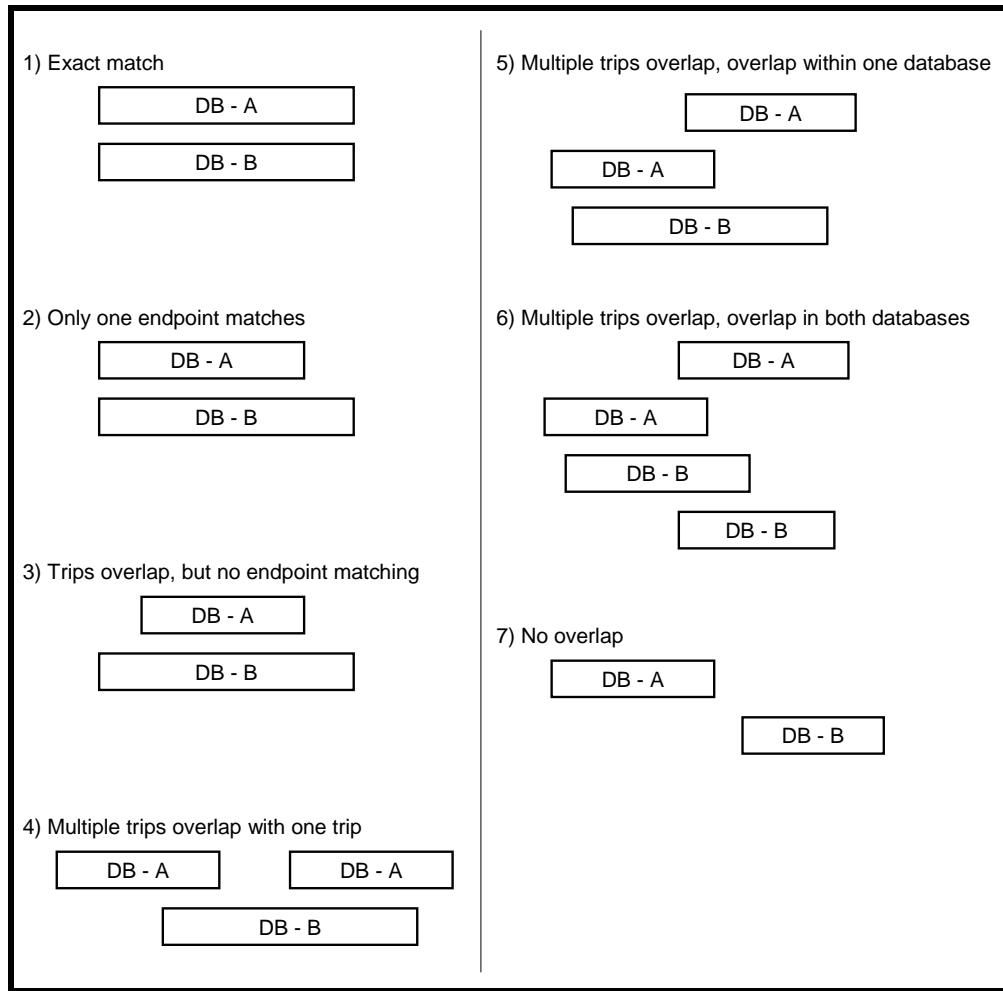
Gear Type	Access Area (Open-Closed)	Area Fished	Mesh Group	Trip Category (General/Limited)	Gear Code(s)		
						SPINY DOGFISH	SUMMER FLOUNDER
<b>Fish Pots/ Traps</b>	OPEN	MA	all	all	181	0.00	0.20
<b>Fish Pots/ Traps</b>	OPEN	NE	all	all	181	0.00	0.20
<b>Lobster Pots</b>	OPEN	MA	all	all	200	0.00	0.20
<b>Lobster Pots</b>	OPEN	NE	all	all	200	0.00	0.20
<b>Crab Pots</b>	OPEN	MA	all	all	300	0.00	0.20
<b>Crab Pots</b>	OPEN	NE	all	all	300	0.00	0.20
<b>Scottish Seine</b>	OPEN	MA	all	all	360	0.00	0.20
<b>Scottish Seine</b>	OPEN	NE	all	all	360	0.00	0.20
<b>Clam Quahog Dredge</b>	OPEN	MA	all	all	400, 386	0.00	0.20
<b>Clam Quahog Dredge</b>	OPEN	NE	all	all	400, 386	0.00	0.20
<b>Troll Line</b>	OPEN	MA	all	all	060	0.00	0.20
<b>Floating Trap</b>	OPEN	MA	all	all	080	0.00	0.20
<b>Floating Trap</b>	OPEN	NE	all	all	080	0.00	0.20
<b>Danish Seine</b>	OPEN	MA	all	all	160	0.00	0.20
<b>Pots + Traps</b>	OPEN	NE	all	all	180	0.00	0.20
<b>Pots + Traps, Conch</b>	OPEN	MA	all	all	183	0.00	0.20
<b>Pots + Traps, Conch</b>	OPEN	NE	all	all	183	0.00	0.20
<b>Pots + Traps, Hagfish</b>	OPEN	NE	all	all	186	0.00	0.20
<b>Pots + Traps, Shrimp</b>	OPEN	NE	all	all	190	0.00	0.20
<b>Rakes</b>	OPEN	MA	all	all	250	0.00	0.20
<b>Rakes</b>	OPEN	NE	all	all	250	0.00	0.20
<b>Diving Gear</b>	OPEN	MA	all	all	330	0.00	0.20
<b>Diving Gear</b>	OPEN	NE	all	all	330	0.00	0.20
<b>Beam Trawl</b>	OPEN	MA	all	all	350	0.00	0.20
<b>Beam Trawl</b>	OPEN	NE	all	all	350	0.00	0.20
<b>Dredge, Other</b>	OPEN	MA	all	all	381	0.00	0.20
<b>Dredge, Other</b>	OPEN	NE	all	all	381	0.00	0.20
<b>Dredge, Mussel</b>	OPEN	NE	all	all	385	0.00	0.20
<b>Dredge, Urchin</b>	OPEN	MA	all	all	387	0.00	0.20
<b>Dredge, Urchin</b>	OPEN	NE	all	all	387	0.00	0.20

## **Appendix I. Method to assign DAS information to VTR trips**

### *Overview*

Matching trips between databases can be accomplished multiple ways. A common way is to use exact matches between the vessel identifier and the sailing and/or landing dates (scenario 1 and 2). This method work reasonably well when the trip endpoints are in agreement across databases. When trip endpoints are not in agreement (e.g., Appendix Figure 1, scenario 3), a trip-midpoint matching process may improve the matching rate. The trip-midpoint method matches trips by finding trips in database (A) where the midpoint of the trip falls between the sailing and landing dates of trips in the other database (B). However, the trip-midpoint matching process is sensitive to which data set is used to define the start and end points of a trip and which data set's trip midpoint is being bracketed [e.g., Appendix Figure 1, scenario 4 where the first VTR trip (A) would not be matched if the process uses the sailing/landing dates from the VTR (A) and the midpoint from the other database (B)]. One matching method that avoids this pitfall is to match trips that exhibit any degree of overlap. The disadvantage of this approach is that it increases the number of multiple overlaps as seen in scenarios 4, 5 and 6. The important questions to ask are: “can multiple matches be removed from the particular analysis?”, and/or, “are multiple matches likely to influence the results of the particular analysis?” If the answer to these questions is “No.” then the overlap method is more likely to produce a larger matched data set compared to either the midpoint-matching process or the more traditional, exact matches (e.g., Appendix Figure 1, scenarios 1 and 2).

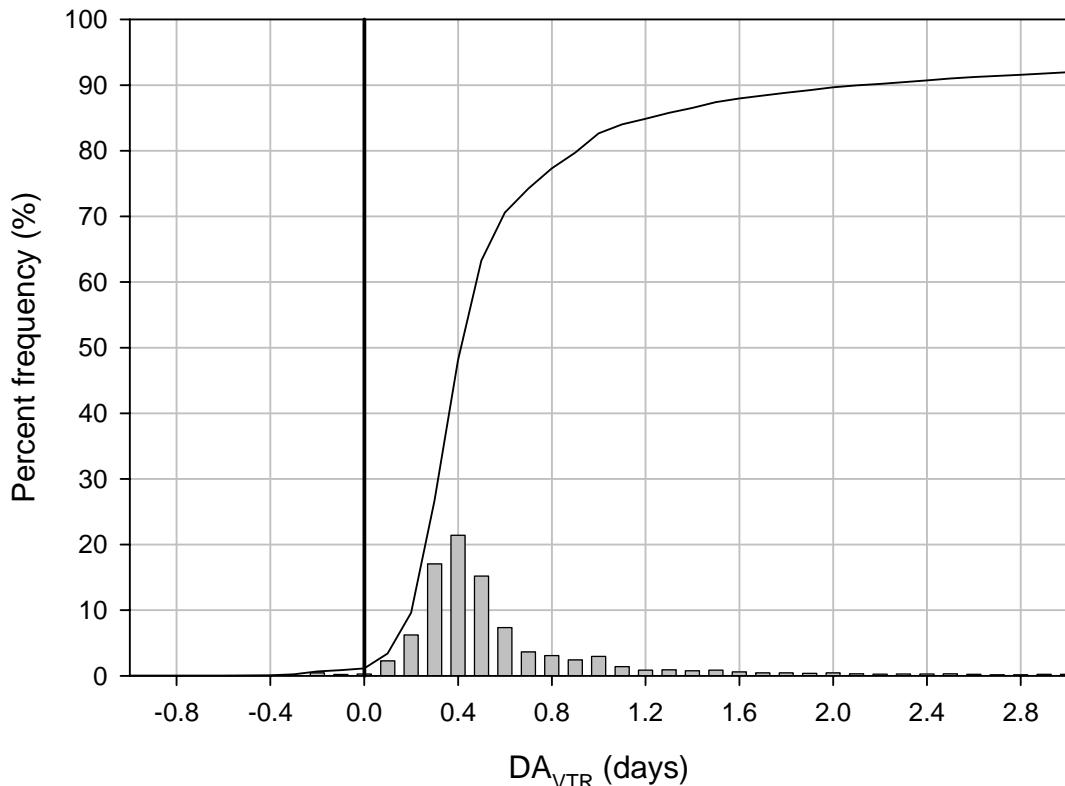
All matching processes will fail when trips that are true matches do not exhibit any overlap in the dates from the respective databases (e.g., Appendix Figure 1 scenario 7). This situation is almost always caused by incorrect data entry of trip times in either of the two databases. Because the VTR database contains self-reported data that is manually entered and only a limited amount of post-processing data auditing occurs, it is a reasonable assumption that the dates of VTR trips are less accurate than those of the other fisheries-dependent databases (e.g., Northeast Fisheries Observer Program, Days-At-Sea, Vessel Monitoring System, etc.).



Appendix Figure 1. Agreement scenarios for matched trips between the VTR database (A) and other fisheries-dependent databases (B) (DB = database).

#### *VTR data conditioning*

Examination of days absent (DA) from the VTR database revealed the presence of negative DA for approximately 1 % of the overall trips (1,227 of 123,766 trips) in 2005. All negative DA values are false. When negative DA values were less than -1.0 days, it was assumed that these were day trips with the times incorrectly entered. To correct for this, all trips with DA  $\leq 0$  were assigned new start and end times of 00:00:01 and 11:59:59 (local times) on the start and end dates respectively. Artificially increasing the duration of these trips in the VTR database resulted in a higher incidence of the situation observed in scenario 6 above. Because these were generally day boats, taking a single trip per day, this was only an issue if a vessel had a negative DA trip and another fishing trip existed for the same day (i.e., multiple trips on the same day). It should be noted that there were instances of multiple trips within the same day in the VTR data (1,038 of 123,766 trips) in 2005. If any of these trips have negative DA, then this last assumption was violated, however the impact was small (37 trips out of 123,766 trips) in 2005. This assumption would also have been violated if any of the negative DA trips had sailing dates that different from landing dates, however in 2005 there were no occurrences of this situation.



Appendix Figure 2. Percent frequency distribution of days absents from Vessel Trip Report (VTR) trips in 2005. Note: x-axis has been truncated at 3 days absents.

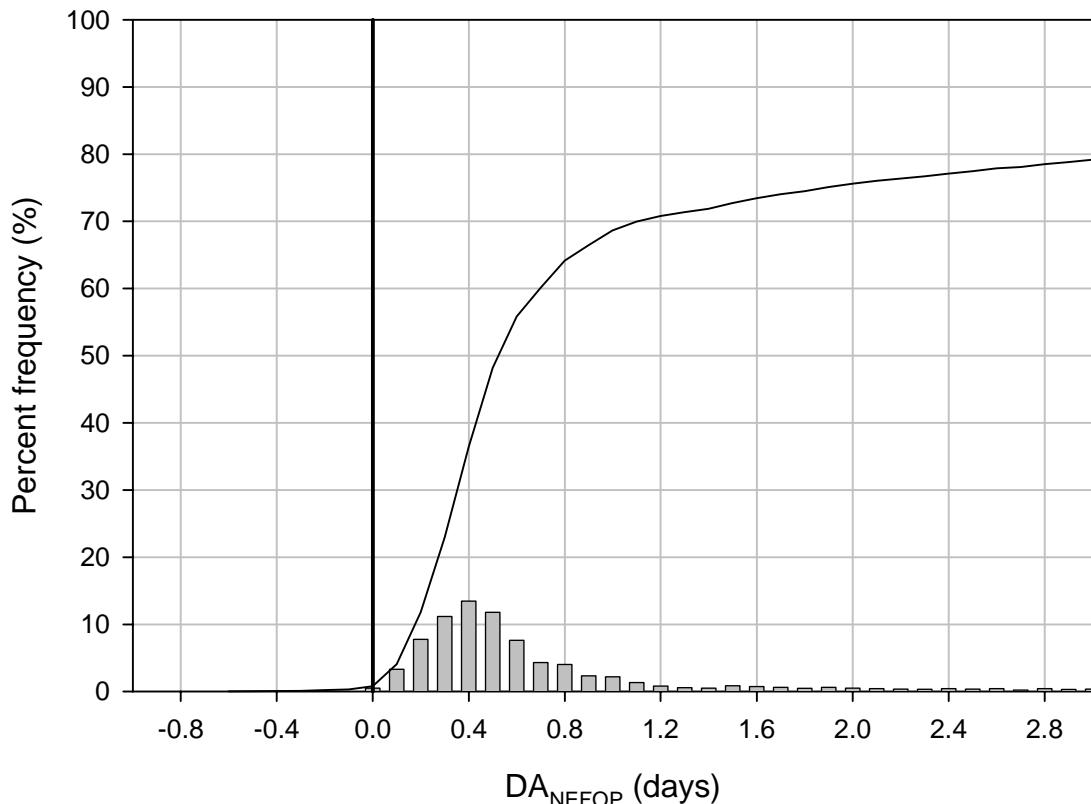
In addition to the concern that adjustment of the times of sailing and landing associated with negative DA trips would result in overlapping trips, there is also the possibility of overlapping trips in the rest of the trips (Appendix figure 1, scenario 5). No adjustment was made for these, but their presence is recognized. The number of overlapping trips was less than 2.4 % of the total trips (2,910 of 123,766 trips) in 2005.

When matching two datasets for which optimization of the match rate is critical, it is important to have a reference match rate from another dataset to provide a point of reference. For example, when matching DAS data to VTR data and only a 90 % match rate can be obtained, it may be that there is 10 % underreporting of VTRs such that a better match is not possible. To provide a reference point for this analysis, the Northeast Fisheries Observer Program data (NEFOP) were examined.

#### *Northeast Fisheries Observer Program (NEFOP) data conditioning*

The NEFOP data identifies vessel using vessel hull number but not permit number. Permit numbers had to be assigned to the NEFOP data to facilitate matches with other databases. This was accomplished using the PERMIT database and matching on the sailing and landings dates. An inability to match NEFOP hull numbers to the PERMIT database truncated the 2005 NEFOP

data set<sup>3</sup> from 4,469 to 4,133. Furthermore, all trips with DA  $\leq 0$  were deleted (a reduction to 4,118 trips for 2005 data). An assumption was made that all remaining dates in the NEFOP dataset were valid and the match rate was assessed on the remaining trips (match rate among valid NEFOP trips). There were 2 overlapping NEFOP trips in the 2005 data.



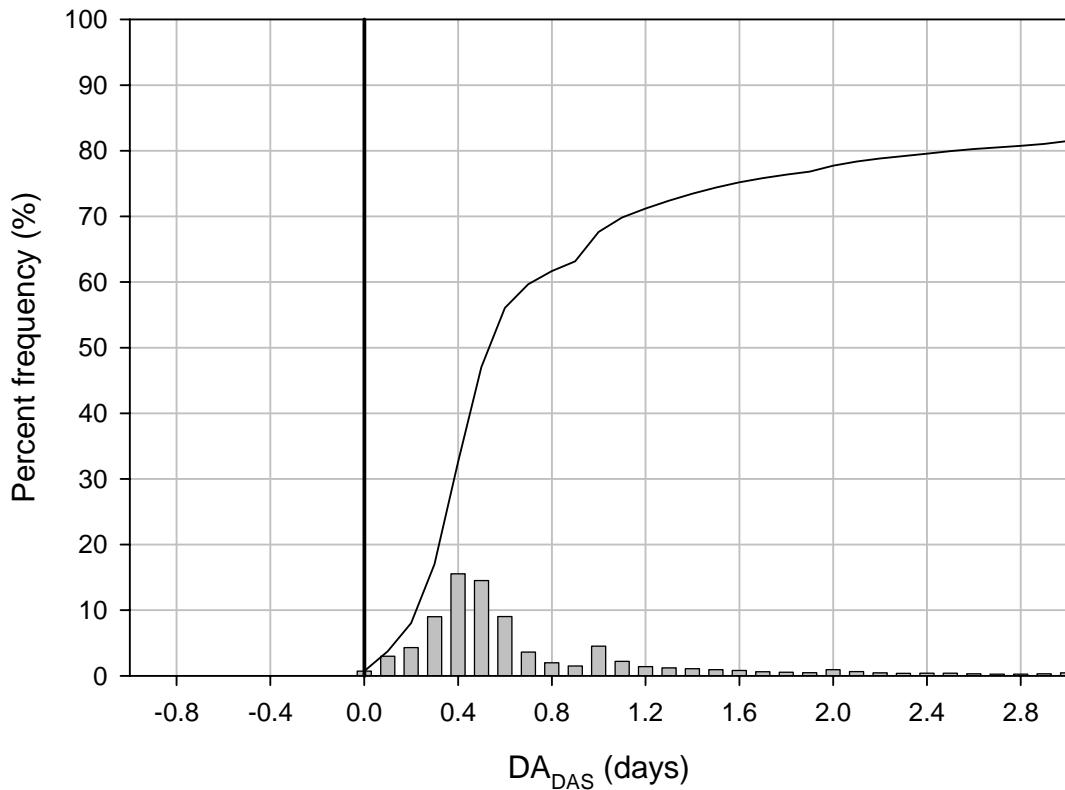
Appendix Figure 3. Percent frequency distribution of days absents from the Northeast Fisheries Observer Program (NEFOP) trips in 2005. Note: x-axis has been truncated at 3 days absents.

#### *Days-At-Sea data conditioning*

No data conditioning was performed on the DAS data set.

---

<sup>3</sup> The join to acquire permit was checked to make sure only one permit was assigned to a given trip.



Appendix Figure 4. Percent frequency distribution of days absents from Days-At-Sea trips in 2005. Note: x-axis has been truncated at 3 days absents.

#### *Match between VTR and NEFOP databases*

In 2005, 3,642 of 4,118 NEFOP trips could be matched to a VTR trip (88.4 % match rate). There were a total of 3,713 matched records. Of the 3,713 matched records there were 8 VTR trips that matched multiple NEFOP trips and 70 NEFOP trips that matched multiple VTR trips (Appendix Figure 1, scenario 4).

#### *Match between VTR and DAS databases*

31,274 of 33,952 DAS trips could be matched to a VTR trip (92.1 % match rate). There were a total of 32,088 matched records resulting in the assignment of DAS information to 31,362 trips. Of the 32,088 matched records there were 644 VTR trips that matched multiple DAS trips and 631 DAS trips that matched multiple VTR trips (Appendix Figure 1, scenario 4).

Based on the match results between VTR and NEFOP, the 92.1 % matching rate of DAS trips appears acceptable. There are four likely reasons for the non-matching of the remaining 7.9 % of the DAS trips in the 2005 data:

- 1) Under-reporting of VTRs (i.e., fishing occurred but no VTR was submitted/received for the trip);

- 2) A VTR was not required for the trip (i.e., vessel was only setting gear or returned to port prior to engaging in fishing activity due to bad weather, mechanical breakdown or some other reason);
- 3) A trip-stub exists in the DAS database that belongs to a longer DAS trip, but was not correctly assigned to a VTR trip because it falls outside of the sailing/landing dates reported on the VTR; and
- 4) Due to incorrect reporting of trip dates to either database, a true match could not be determined when one exists (Appendix Figure 1, scenario 7).

For the purposes of this analysis, the critical issue was to correctly assign the appropriate DAS information (fishery code, DAS category code and access area) to the VTR trip. So long as VTR trips were matched with the appropriate DAS information, it was unimportant that a DAS transaction could not be matched to a particular VTR trip (i.e., reason 3 given above).

It was important to ensure that the overlapping matches identified above (644 VTR trips matching multiple DAS trips and 631 DAS trips matching multiple VTR trips) did not result in conflicts with the assignment of DAS information to VTR trips. This was determined by looking for VTR trips with multiple DAS code combinations (fishery\_code||das\_category||access\_area). In the 2005 data there were 80 VTR trips (< 0.3 % of total 31,362 assigned VTR trips) that were assigned conflicting VTR information resulting in 167 conflicting records requiring modification to reduce the conflict and assign a single DAS designation to these trips. Based on a visual inspection of these 167 conflicting records a decision was been made to use the DAS designation with the longest days absent for a particular VTR trip. If a tie was encountered in the days absent then the last DAS designation for a particular VTR trip was used.