



## New England Fishery Management Council

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### MEMORANDUM

**DATE:** May 25, 2012  
**TO:** Groundfish Oversight Committee  
**FROM:** Groundfish Plan Development Team (PDT)  
**SUBJECT:** **PDT Meeting Report, May 16, 2012**

1. The PDT met in Newburyport, MA to continue addressing sector monitoring issues, work on ABC specifications, and discuss GB yellowtail flounder. PDT members present were Tom Nies and Fiona Hogan (NEFMC), Sarah Heil, Melissa Vasquez, and Dan Caless (NERO), Chad Demarest and Evan Bing-Sawyer (NEFSC), Steve Correia (Massachusetts DMF). Sarah Cierpich represented the NEFSC observer program. Amy Van Atten and Mike Palmer of the NEFSC attempted to participate by web conference but a poor connection limited their involvement. Members of the public at the meeting included Jackie Odell, Libby Etrie, Gib Brogan, Emilie Litsinger, and Jonathan Peros.

2. The PDT reviewed numerous draft documents. They included draft analyses of full retention of allocated groundfish stocks, draft measure text for an auction to defray monitoring costs, draft measure text for full retention, FW 47 alternatives for reactive AMs for halibut and wolffish, past summaries of SNEMAB windowpane flounder scallop fishery sub-ACLs, three preliminary papers on monitoring effects (both selection effects and observer effects).

#### **Sector Monitoring Issues**

##### *Observer Effects*

3. The PDT held an extensive discussion of an in-progress analysis that attempts to determine if there is evidence of observer effects: that is, if there is evidence that vessels fish differently when an observer is on board. While this work is not yet complete, the following summary is provided to update the Committee on current progress.

4. Identifying observer effects from available data is a complicated task because of the normal variability of catches between trips and between individual vessels. It is also confounded by the possibility of bias in the selection of trips that actually carry an observer. Benoit and Allard (2009)<sup>1</sup> described an analytic technique to isolate observer effects. The PDT is adapting this technique to the groundfish fishery. Our approach is very similar to that of Benoit and Allard. The primary differences are in the choice of metrics that are evaluated and the analysis by different time periods.

5. In order to minimize the impacts of variability between vessels, the analytic approach compares a series of metrics for observed and unobserved trips of an individual vessel. The following broad overview simplifies many of the details of the analysis for clarity. A vessel's trips are ordered by date. Sequences of three trips are identified where an observed trip (O) is bracketed by two unobserved trips (U). The observed trip is randomly matched to one of the unobserved trips and the difference of each metric is calculated (symbolized as a U-O result). A similar approach is followed for sequences of three unobserved trips, with the middle trip matched to one of the unobserved trips. We restrict matching pairs to a time window in order to limit variability caused by seasonal variation in catch rates. This is repeated for all vessels.

6. The resulting data is summarized and statistical tests are applied to determine if there are significant differences. If there is an observer effect, the distribution of the differences for the U-O pairs will be different than the differences for the U-U pairs. The preliminary results suggest that there may be statistically significant differences between observed and unobserved trips for all three primary gears (trawl, sink gillnet, and longline).

7. The PDT identified a number of issues that need to be explored and will pursue them over the next six to eight weeks. They include:

- Refinements to the data set used in the analyses. This includes evaluating the effect of restricting the analysis to trips that land at least one pound of groundfish.
- Correcting the algorithm so that trips in a matched pair are in the same fishing year
- Evaluating the power of the analyses: how many trips must be observed to detect an observer effect. This is a difficult question to address but the PDT developed a possible approach to answer it and will investigate that issue.

8. A significant question that remains is due to the nature of the analysis: it is based on metrics that we can compare from both observed and unobserved trips. For example, the metrics used include total landings, cod landings, roundfish landings, and groundfish value. If the preliminary results stand, then it may show statistically significant differences between some or all of these observable metrics. But the analysis does not directly address what is occurring with respect to discards on unobserved trips because there is no data. As a result, if there are differences, it is not clear how this will affect the ability to monitor sector catches. The differences could be

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<sup>1</sup> Benoit, Hugues P. and Allard, Jacques. 2009. Can the data from an at-sea observer program be used to make general inferences about catch composition and discards? *Can. J. Fish. Aquat. Sci.* 66:2025-2039.

statistically significant yet have little impact on sector catch monitoring. This is a critical issue to resolve as the Committee attempts to develop an efficient monitoring system.

### *Selection of Observed Trips*

9. One behavior that could lead to a bias in the selection of observed trips is if vessel operators cancel trips when an observer is assigned. Because of the way trips are assigned - a trip is first identified by the PTNS, then offered to a provider – this is a complicated issue to address. The PDT reviewed two analyses that examined this question, but their results differ. The two analysts agreed to reconcile the differences.

10. The Committee expressed an interest in assigning observer coverage to trips that land the most groundfish, and used the example of assigning more observer coverage to multi-day trips rather than day trips since more groundfish is landed on multi-day trips. Two analyses were reviewed that examine this issue. They are described in enclosure (1). The analyses conclude that (1) a higher percentage of observer coverage is assigned to multi-day trips; and (2) coverage is distributed relatively evenly across most sectors, with two exceptions; (3) identification of a sector as a day trip sector is marginally significant in explaining sea day use – daytrip sectors use more sea days for a given catch.

11. If observer coverage is weighted towards particular vessels, it may introduce a bias in discard estimation. The PDT will perform a simulation to evaluate whether this is a noteworthy concern. If different assignment methods are used for NEFO and ASM trips, then it may not be possible to combine the data from both programs for quota monitoring or stock assessment purposes.

### *Funding Mechanisms*

12. Draft management measure text was drafted for the Committee's proposal to use part of the ACL or management uncertainty buffer to defray monitoring costs. The draft text focuses on the distribution of the ACE and not the source of the ACE. The estimate of the amounts that might be raised has been updated with approximate FY 2013 ACLs; please see enclosure (2). The draft measure also includes strawman options for distributing the funds, including one that attempt to address the Committee's suggestion that sectors who have more of a need for the funds receive more of the available ACE. How these funds would have been distributed based on FY 2010 activity using the different options is also provided. Note that under some options a sector could get additional ACE that is worth more than the costs incurred. Please see enclosure (xxx). The PDT requests clarification on this issue as it appears that such an approach may reward inefficiency or waste of monitoring resources.

### *Full Retention*

13. The PDT prepared a summary of the regulatory restrictions and biological effects of a full retention policy for allocated groundfish stocks that will be incorporated into the monitoring white paper. Please see enclosure (3). The draft text does not exclude damaged fish from the full retention requirement. This is an issue that needs Committee attention (and frankly the draft text was written to prompt discussion). Any exemptions from the full retention requirement will reduce the expected benefits from the measure and as a result should be carefully considered.

14. The primary regulatory measure that prevents full retention for sector vessels is the minimum fish size. In summary, for some stocks it is probable that removing minimum fish sizes will shift selectivity to younger fish. The magnitude of the shift is difficult to predict, particularly if mesh regulations are not changed. Any change will not be quantified until the next assessment is performed for a given stock. The PDT explored the impacts of removing commercial minimum size limits for four representative stocks. Based on these results, shifts in selectivity to younger ages will reduce long-term yields from the fishery, will reduce the  $F_{MSY}$  proxy, and will usually increase  $SSB_{MSY}$  values. It may, however, improve information on catches by reducing discards and reduce operating costs as vessels target younger fish that are more abundant than older fish.

15. As noted in the enclosure, minimum fish sizes are used together with minimum mesh sizes to control the age of capture. The minimum size was adopted in part to reduce incentives to use illegal small mesh. The removal of minimum fish sizes is likely to create incentives to use illegal mesh, or to request sector exemptions to use smaller mesh. This is part of the reason why it is difficult to predict how much selectivity will change. An argument can be made that minimum mesh sizes should be reduced or eliminated if there is no minimum fish size. There may, however, be implications for other fisheries that have not been fully explored. The PDT believes there are three general approaches to this question.

- Do not take any action to change mesh sizes. Sectors can request exemptions if they desire to use a smaller mesh. If this approach is chosen the Council should be clear whether they believe such request should be granted.
- Implement a phased reduction in mesh size so that changes can be evaluated as they occur.
- Take no action at present but address the issue in a future action. Delaying a broader change would give time to evaluate the effects of removing the minimum size before the mesh is changed.

### **ABCs/ACLs/AMs**

16. The PDT briefly discussed the direction from NMFS that the Council needs to develop reactive AMs for wolffish, halibut, and SNE/MA winter flounder. Attached to this report (enclosure (4)) are the AM areas that were developed for FW 47, as well as a similar area for SNE/MA winter flounder (Figure 8). These options could be readily incorporated into the ABC action should the Committee desire to use them.

17. The Committee intends to discuss a scallop fishery sub-ACL for SNE/MAB windowpane flounder. Such a sub-ACL was first considered in FW 47. The PDT discussed this issue in an earlier report in fall 2011, but there were questions about the catch estimates which led to the Committee deferring action. The following PDT discussion is repeated from that earlier PDT report:

“With respect to the scallop fishery, the PDT reviewed catches over various time periods. The scallop fishery modified twine tops in order to reduce flounder catches over the period 1999 – 2004. The first change was to increase twine tops to eight inches in 1999, by 2001 the ten-inch twine top was required in all access areas, and in 2004 the ten-inch twine top was required for all areas. The PDT recommends using the period 2001 – 2010 as the basis for the scallop fishery SNE/MA windowpane flounder sub-ACL. This stock is of limited value to the groundfish fishery; much of the catch has been discarded in the past and landing is currently prohibited. If the scallop sub-ACL is caught, it will lead to AMs that will reduce scallop revenues. For this reason, the PDT recommends a sub-ACL that is unlikely to be exceeded if recent catches are an indicator of future catches. The PDT recommends setting the sub-ACL for this stock at the the 90th percentile of recent catches.”

18. The recent assessment update of this stock revised the catch stream for scallop dredge vessels. In most cases the catch estimates were reduced. The resulting distribution is shown in the tables below for two different time periods. The PDT still suggests that if the Committee decides to establish a sub-ACL for this stock, the 90<sup>th</sup> percentile of recent catches may be an appropriate level. Please note that the revised catch streams mean that this value (31.8 pct of the ABC ) is lower than that recommended in the fall of 2011 (40 pct for the ABC) because of the revised catch stream.

19. Preliminary ACL monitoring results (enclosure 5) for FY 2011 suggest scallop fishery catches of SNE/MA windowpane flounder declined in FY 2011 to 86.7 mt, or 16 pct of the total catch. Catches by other fisheries continue to account for a large percentage of SNE/MA windowpane flounder removals. The fluke fishery is estimated to have discarded 102.5 mt, and the scup and unknown other fisheries discarded amounts of similar magnitude to the scallop fishery.

**Table 1 – Updated scallop dredge catches of SNE/MA windowpane flounder**

<b>1999 - 2010</b>	Percent of Total Catch	Scallop Catch (mt)	<b>2001 - 2010</b>	Percent of Total Catch	Scallop Catch (mt)
N of cases	12.0	12.0	N of cases	10.0	10.0
Minimum	3.9	7.1	Minimum	3.9	7.1
Maximum	38.2	187.0	Maximum	38.2	187.0
Median	14.3	54.0	Median	14.3	54.0
Mean	17.1	71.5	Mean	16.8	67.6
50%	14.3	54.0	50%	14.3	54.0
60%	14.7	59.8	60%	14.7	58.2
70%	16.0	70.0	70%	15.3	66.0
75%	19.0	80.5	75%	16.1	70.5
80%	24.4	97.0	80%	19.5	79.0
90%	30.6	149.9	90%	31.8	111.4
95%	34.3	169.5	95%	35.0	149.2
99%	37.5	183.5	99%	37.6	179.4

## **Enclosure (1)**

### **Distribution of Observer Sea Days**

The Groundfish Committee expressed an interest in modifying the way sector trips are selected for ASM observers. The concern expressed was that observer coverage is being assigned based on trips taken rather than the quantity of fish landed. This might result in excessive coverage on vessels that land only a small part of the overall groundfish catch. The PDT was asked to develop an alternative that would assign observer coverage so that observer funds are spent on the vessels and trips that land the most catch.

The PDT examined the underlying assumption in this request: that the current assignment of NEFOP and ASM observers results in a disproportional coverage on small vessels that take shorter trips and land a small fraction of the total groundfish landings. Two analyses are described below. Additional analyses will be performed in the future.

#### **Breakdown of Observer Sea Day Coverage by Trip Type**

Observer coverage rate were summarized by trip type (day vs. multi-day trips). The rates were determined based on trips, sea days, and groundfish landings. For this analysis, the observer sea days were summarized as “raw” sea days –that is, the actual time deployed. Landings data were taken from the dealer (CFDERS) database. In order to characterize landings by trip type, vessels were characterized as either day boat or multi-day boat based on whether 50 percent or more of their trips were  $\leq$  two days in length based on AMS data. This worked for all but 36 vessels which were categorized as day/multi based on the permit ton class (3 and 4 where considered multi-day boats). This approach was necessary because it is not possible to match every dealer record to a DAS trip declaration.

This analytic approach has a few caveats. The most important is that the numbers that result do not necessarily agree with accounting done by the Observer Program and the Regional Office. Because of these caveats, the PDT believes the results discussed below are most accurate for the trip and sea day coverage rates, and may be less accurate for the groundfish landings coverage rates.

- The trips are fairly consistent give or take a hundred or so.
- The sea days are about 2/3 of the estimates maintained by the Observer Program. The observer program estimates sea day observer coverage based on whole days, this analysis leaves it as raw sea days.
- The estimates of total groundfish landings are substantially lower than the Regional Office's estimates (by about 30%). This is believed to be due to imputation done for missing trips by the Regional Office.

Results are summarized in Table 2. Despite the uncertainties in the actual values in the tables, some general patterns stand out in this analysis:

1. There does seem to be differential coverage between day boats and trip boats: *coverage rates are higher on trip vessels*. It's unclear why this is, but some of the

coverage issues discussed in the last PDT report are possible causes (vessel and provider effects). This can be seen from the following data in the table:

- The trip coverage rate is higher on multi-day trips (35 pct) when compared to day trips (26 pct).
- The coverage rate on sea days is higher for multi-day trips (38 pct) when compared to day trips (27 pct).
- The coverage rate on groundfish landings is higher for multi-day trips (48 pct) than day trips (32 pct). Because of the caveats mentioned above, this result is the most uncertain.

2. While there are a greater number of day boat trips, the number of sea days as well as the amount of groundfish landings coming from day trips is only about 30-40% that of multi-day boats.

### **Breakdown of Observer Costs by Sector**

For the sector workshop, NERO provided the Council a summary of sector fishing activity for FY 2010. This summary includes sector landings and discards. NEFOP provided the PDT a summary of at-sea monitoring costs by sector for the same year. The summary breaks-down the sea days for each sector, as well as each sector's share of travel and training costs. These two tables were combined to analyze differences in sector monitoring costs. This allows comparisons to be made on the monitoring costs for each sector. It also allows identification of the sectors with the highest overall discard rates, though this is based on total groundfish catch and is not stock or gear specific.

While this comparison does not explicitly address the question of observer costs for day trip and multi-day trip vessels, in at least some cases sector membership may be a rough proxy for the majority of the trips taken by the sector's vessels. A few sectors have identified their members as primarily day trip or inshore vessels. These sectors are: NESC II/NESC III/NESC V/NESC X/NESC XI/NESC XII/NESC XIII/GBFG/NCCS.

The combined tables are provided in Table 3. The data from these tables can be analyzed to determine whether monitoring costs and effort by sector are related to pounds landed and /or discarded. Unlike the previous analysis, in this table observer sea days are counted in whole days regardless of the time deployed. This is because in FY 2010 observed days were billed as a full day for any part of a day the observer was deployed.



Figure 1 shows the percent of total groundfish landings and the percent of total groundfish discards for each sector. Generally, the percent of discards increases with the percent of landings and about half the sectors are clustered near the line where the percent of discards equals the percent of landings. There are three sectors where the percent of groundfish discards is considerably higher than the percent of groundfish landings (Common pool, NESC V, NESC IX), and three where the percent of groundfish discards is considerably lower than the percent of groundfish landings (NESC III, NESC VI, and SHS 1).

Figure 2 shows the percent of at-sea monitoring costs (NEFOP and ASM combined) against the percent of estimated discards. If a sector's monitoring costs as a percent of total were the same or almost the same as the percent of groundfish discards, it would be plotted on or near the 1:1 line shown. The percent of monitoring costs for six sectors are lower than the percent of groundfish discards estimated (NESC II, NESC V, NESC VIII, NESC XIII, NESC IX, and common pool). Three of these sectors consist primarily of inshore vessels. The percent of monitoring costs for six sectors are higher than the percent of groundfish discards estimates for those sectors (PCCS, NESC III, NESC XI, NESC X, GBFG, and SHS1). Four of these sectors are primarily inshore vessels.

Figure 3 plots the observed sea days against groundfish pounds caught. Monitoring costs are primarily generated by the number of sea days. While the number of sea days increases with pounds landed, there is some variability at the lower catch levels. There is one group of sectors (highlighted by an oval) that appear to have more sea days than other sectors at similar catch levels. Both sectors in the oval are primarily inshore sectors (GBFG, NESC III). Of the sectors in this oval, one sector where the percent of discards are higher than the percent of landings (GBFG) and one where the percent of discards is lower than the percent of landings (NESC III). If a regression line is fitted to these data (sea days as a function of catch and a constant), only two sectors lie above the 95 pct confidence interval of the regression while one lies below (Figure 5). This regression line is correlated well with the data, with an  $r^2$  of 0.834 (see data following table 5).

The data were also fitted to a general linear model that included identification as a day trip sector as a categorical variable (using effects coding). The results are shown in Table 4. This model is marginally significant at an alpha of 0.05 and an  $r^2$  of 0.857. This suggests that identification as a daytrip sector does improve the model fit slightly. It suggests that sea days used by sectors that are not identified as daytrip sectors, on average, are below the overall sea day mean for a given catch. Given the small data set, the results are sensitive to even one sector being incorrectly identified as a daytrip or non-daytrip sector.

## **Discussion**

There is little evidence in these analyses that there was a consistent bias in observer coverage based on trip length during FY 2010. There are, however, a few sectors that appear to have observer costs that are significantly different than other sectors. This may

be due in part to the fact that costs in FY 2010 were billed for full sea days rather than the time actually underway. Billing observer sea days according to the time underway might improve the distribution of costs.

Identification of a sector as a daytrip sector does account for part of the variance (about 30.3 pct) in the assignment of sea days during FY 2010. This categorical factor is marginally significant at an alpha of 0.05. At a given catch, a daytrip sector would be expected to use more sea days than a sector that was not identified as a daytrip sector.

The common pool in particular appears to have lower monitoring costs than would be warranted for the activity by these vessels, and is no doubt a result of the lower coverage rates for this component (an estimated 11.4 pct of trips are observed, less than half the percent of trips observed for most sectors). This may be due to the fact that Handgear A vessels do not call in the observer program for PTNS, leading to a shortfall in the number of common pool trips observed.

Table 2 – Coverage rates for day trip and multi-day trip vessels

Trip type	Observed trips	Total trips	Trip coverage rate	Observed sea days	Total sea days	Sea day coverage rate	Observed groundfish landings (mt)	Total groundfish landings (mt)	Ground fish landings coverage rate
Day trip (<= 2 days)	3047	11669	0.26	1496.8	5479.2	0.27	1718.4	5402.7	0.32
Multi-day trip (> 2 days)	841	2382	0.35	4975.3	13265.7	0.38	7613.9	15739.7	0.48
Total	3888	3551	0.28	6472.2	16804.9	0.35	9332.3	21142.4	0.44
Day/Multi-day ratio	3.62	4.90		0.30	0.41		0.23	0.34	

Table 3 – Monitoring costs and catches by sect, FY 2010

SECTOR	Estimated Coverage	Number of Seadays				Catch			Monitoring Cost
	NEFOP+ASM	NEFOP	ASM	FSB	TOTAL	Landings	Discards	Total	Total
Common Pool - Groundfish	11.4%	94	250	0	344	1,497,294	325,566	1,822,860	\$251,610
GB Cod Fixed Gear Sector	32.2%	142	733	0	875	2,135,072	146,336	2,281,408	\$623,043
Sustainable Harvest Sector 1	30.8%	550	1467	0	2017	22,670,561	599,709	23,270,270	\$1,474,546
Port Clyde Community Groundfish Sector	27.9%	16	243	0	259	1,000,255	35,224	1,035,479	\$180,956
Northeast Fishery Sector VII	28.4%	128	256	0	384	2,057,048	123,688	2,180,737	\$285,168
Northeast Fishery Sector VIII	24.8%	68	227	7	302	3,069,013	152,992	3,222,005	\$212,392
Northeast Fishery Sector XI	28.1%	104	445	1	550	2,879,262	103,313	2,982,575	\$394,307
Northeast Fishery Sector XII	34.8%	5	26	0	31	126,155	7,920	134,075	\$21,964
Northeast Fishery Sector II	26.9%	239	751	1	991	9,981,597	431,140	10,412,736	\$716,417
Northeast Fishery Sector III	25.2%	205	583	0	788	2,650,952	65,872	2,716,824	\$573,520
Northeast Fishery Sector X	30.8%	122	188	1	311	846,464	54,447	900,911	\$232,194
Northeast Fishery Sector XIII	28.6%	103	310	0	413	3,587,713	197,350	3,785,063	\$300,036
Northeast Fishery Sector IX	26.8%	279	462	0	741	8,171,211	496,965	8,668,177	\$557,945
Northeast Fishery Sector V	31.4%	131	288	0	419	1,309,850	179,293	1,489,142	\$309,655
Tri-State Sector	22.0%	33	42	0	75	656,798	23,020	679,818	\$56,773
Northeast Fishery Sector VI	18.8%	44	126	0	170	2,864,288	59,027	2,923,314	\$123,635
Northeast Coastal Communities Sector	82.1%	22	1	9	32	7,350	2,579	9,930	\$19,252
									\$0
<b>TOTAL FOR ALL SECTORS</b>	<b>26.8%</b>	<b>2285</b>	<b>6398</b>	<b>19</b>	<b>8702</b>	<b>64,498,920</b>	<b>2,975,138</b>	<b>67,474,058</b>	<b>\$6,333,411</b>

Figure 1 – FY 2010, percent of groundfish landings and percent of discards

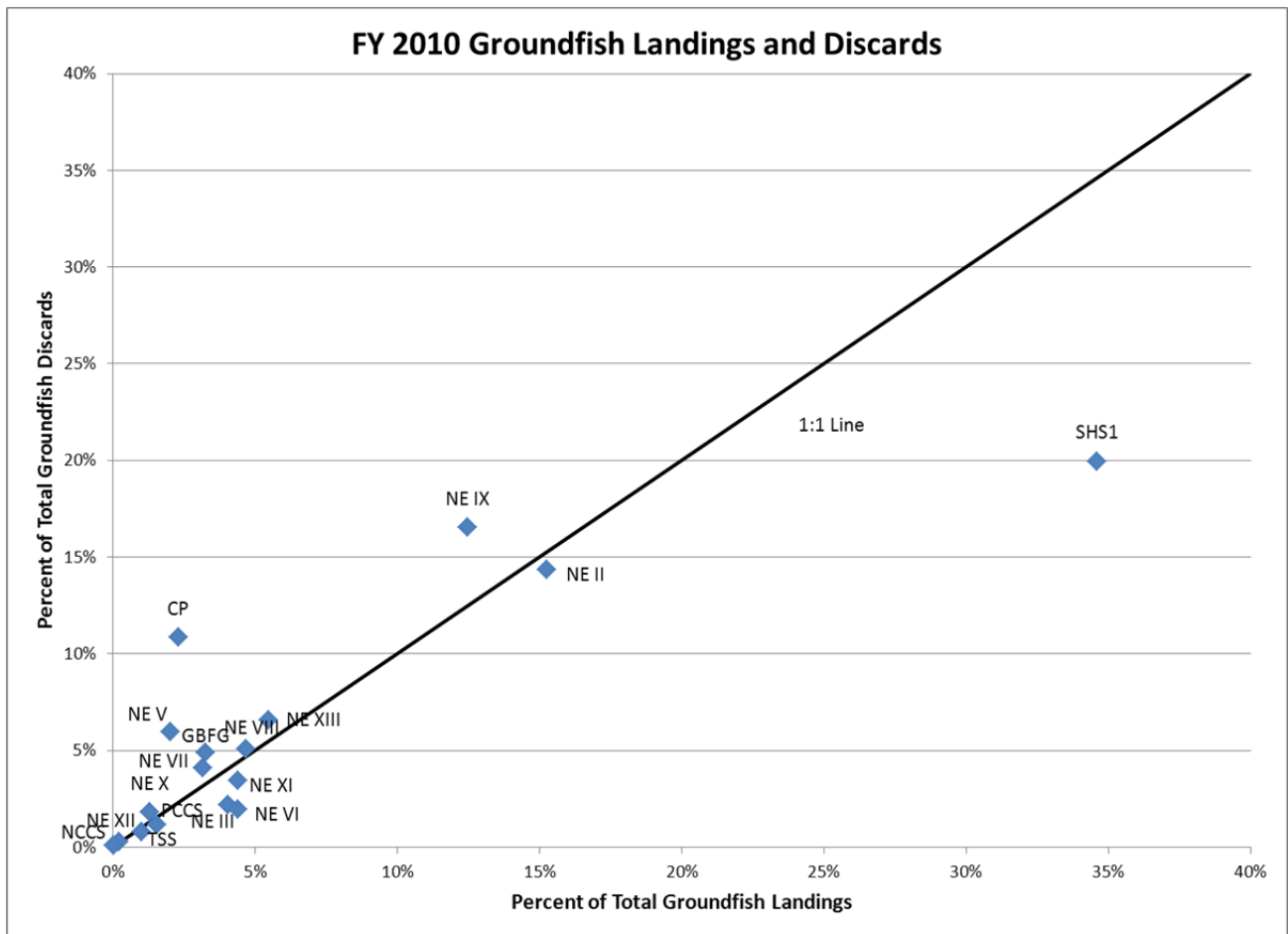


Figure 2 – Percent of monitoring costs and percent of discards

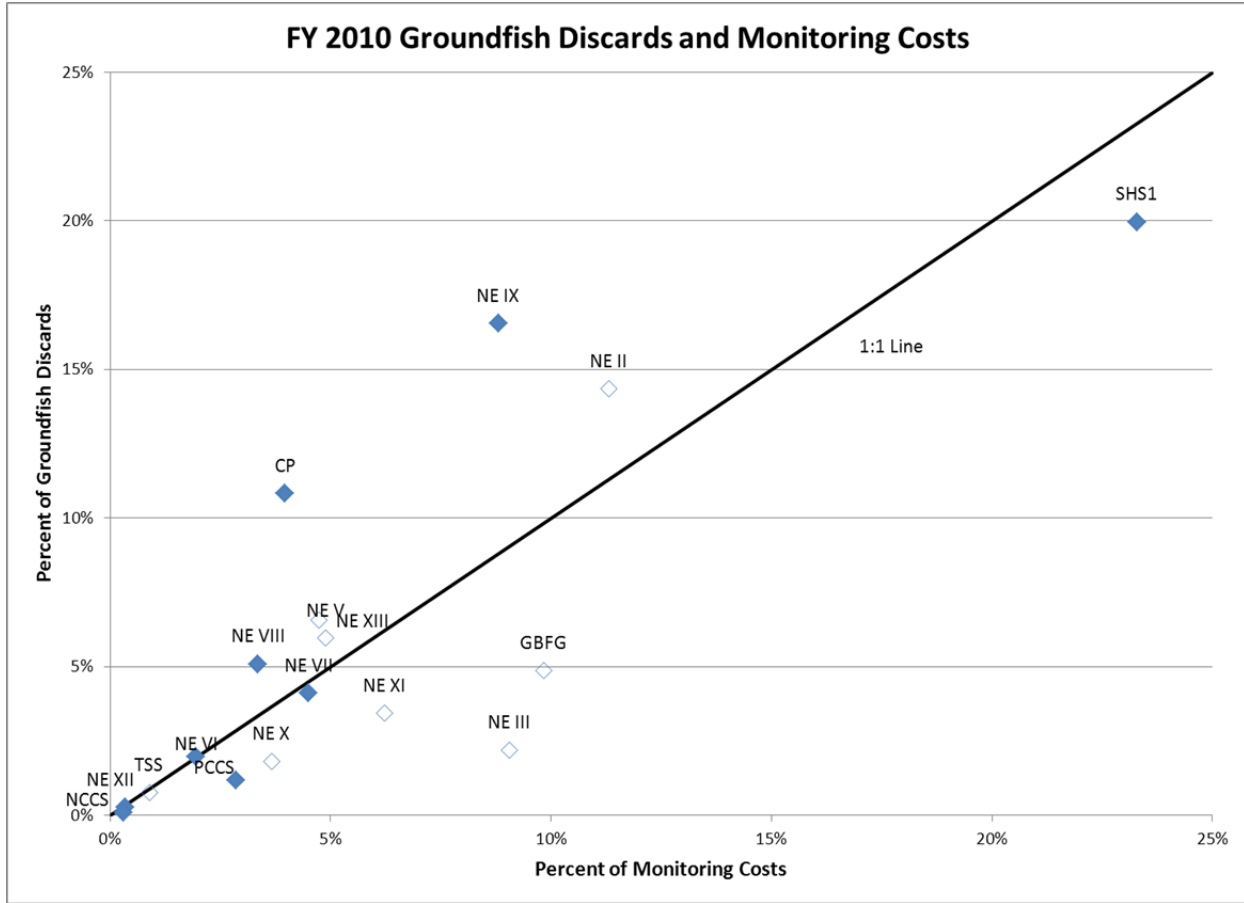


Figure 3 – FY 2010 observed sea days and groundfish pounds caught

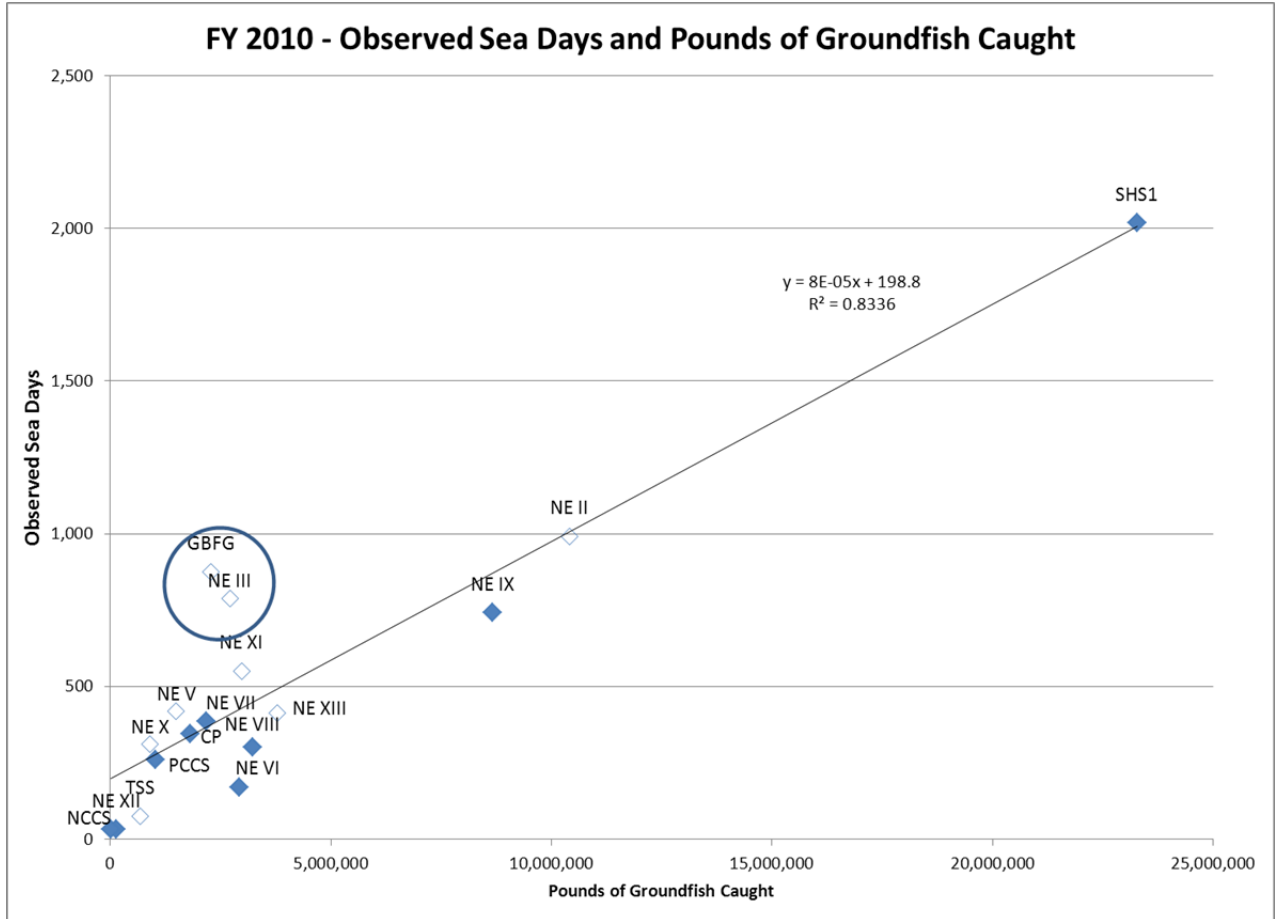


Figure 4 – FY 2010 observed sea days and groundfish pounds discarded

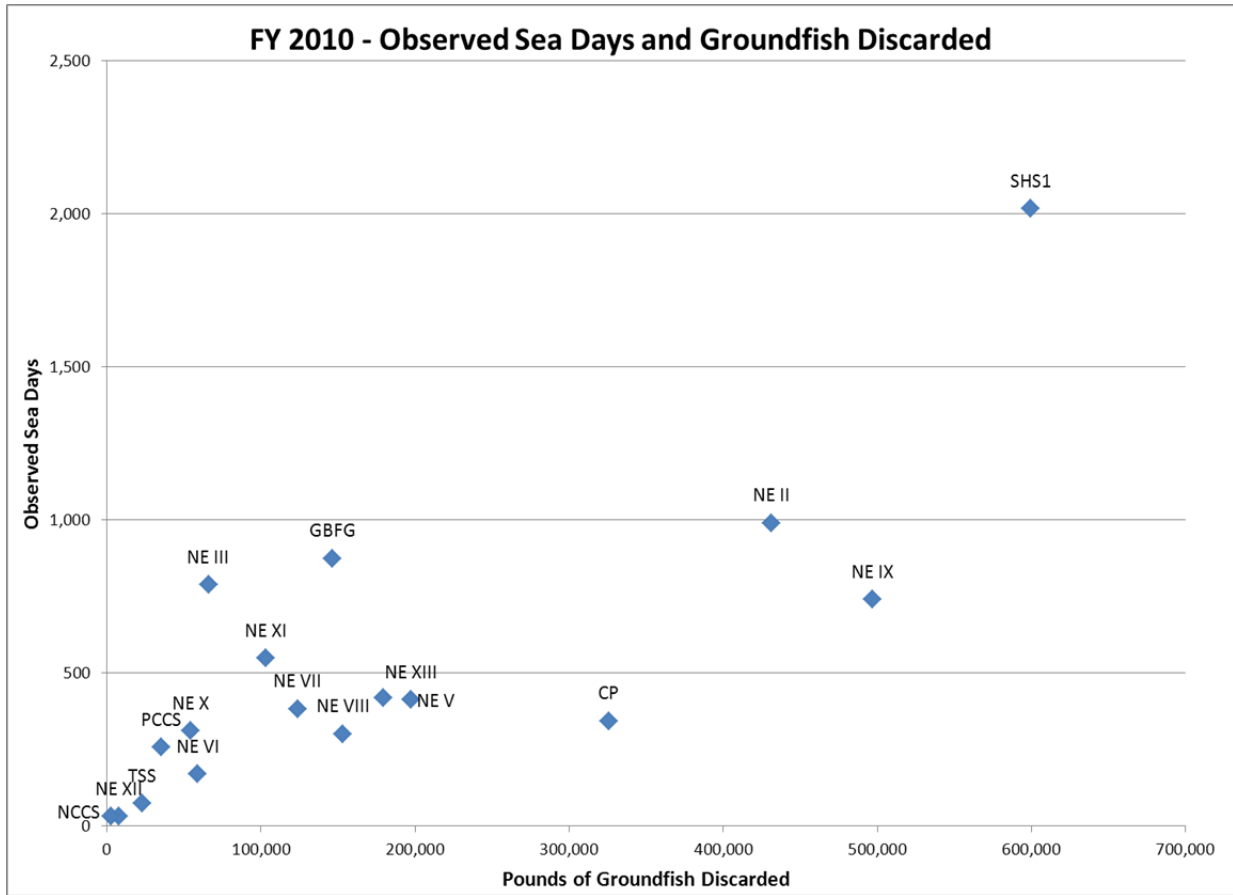
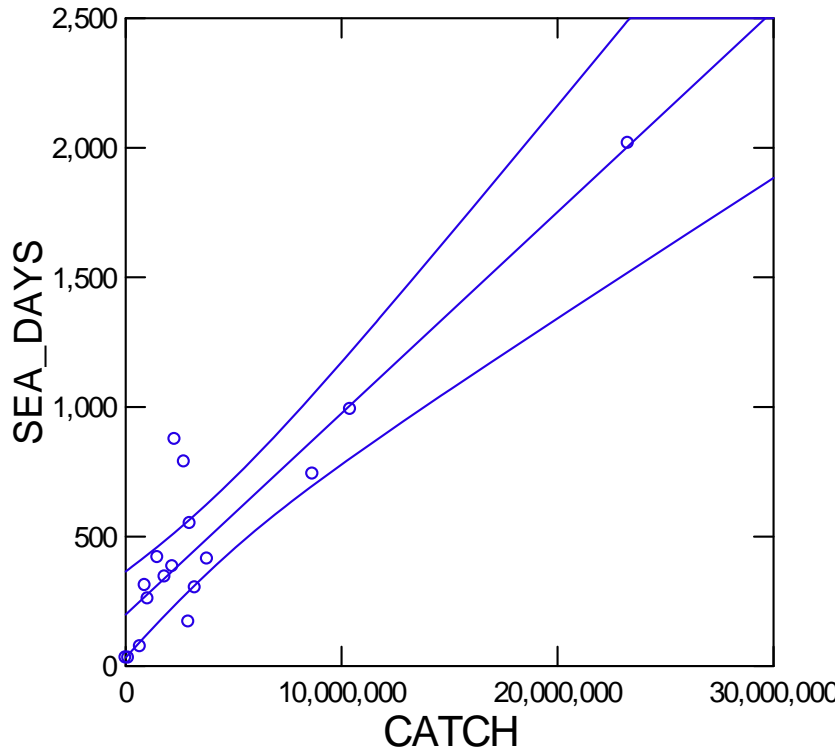
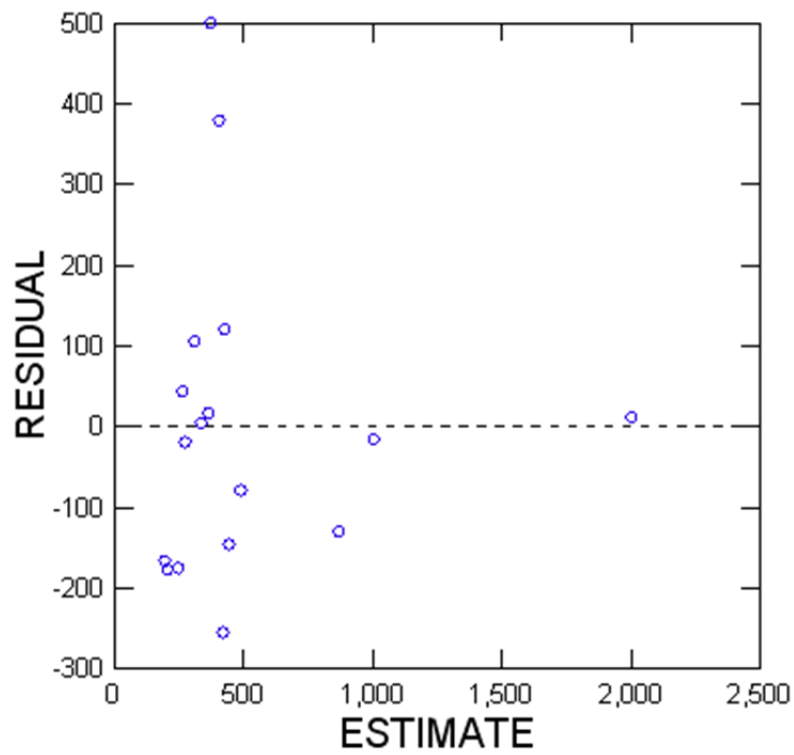




Figure 5 – Linear regression of groundfish caught and observed sea days



Plot of Residuals vs. Predicted Values



Dependent Variable	SEA_DAYS
N	17
Multiple R	0.913
Squared Multiple R	0.834
Adjusted Squared Multiple R	0.823
Standard Error of Estimate	203.592

Regression Coefficients $B = (X'X)^{-1}X'Y$					
Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	p-Value
CONSTANT	198.797	61.174	0.000	.	3.250
CATCH	0.000	0.000	0.913	1.000	8.670

Confidence Interval for Regression Coefficients				
Effect	Coefficient	95.0% Confidence Interval		VIF
		Lower	Upper	
CONSTANT	198.797	68.408	329.186	.
CATCH	0.000	0.000	0.000	1.000

Analysis of Variance					
Source	SS	df	Mean Squares	F-Ratio	p-Value
Regression	3,115,809.424	1	3,115,809.424	75.171	0.000
Residual	621,748.341	15	41,449.889		

**WARNING**

Case 2 is an Outlier (Studentized Residual : 3.238)  
Case 3 has large Leverage (Leverage : 0.776)

**Table 4 – GLM results for regression of sector sea days as a function of catch and daytrip identification**

Effects coding used for categorical variables in model.  
The categorical values encountered during processing are

Variables	Levels				
SECTOR\$ (17 levels)	CP	GBFG	NCCS	NE II	NE III
	NE IX	NE V	NE VI	NE VII	NE VIII
	NE X	NE XI	NE XII	NE XIII	PCCS
	SHS1	TSS			
DAYTRIP\$ (2 levels)	0.000000	1.000000			

Dependent Variable	SEA_DAYS
N	17
Multiple R	0.93518
Squared Multiple R	0.87457

Estimates of Effects $B = (X'X)^{-1}X'Y$		
Factor	Level	SEA_DAYS
CONSTANT		187.25975
DAYTRIP\$	0.000000	-97.92409
CATCH_1000		0.08197

Analysis of Variance					
Source	Type III SS	df	Mean Squares	F-Ratio	p-Value
DAYTRIP\$	152,940.27828	1	152,940.27828	4.56725	0.05072
CATCH_1000	3.26648E+006	1	3.26648E+006	97.54677	0.00000
Error	468,808.06286	14	33,486.29020		

Least Squares Means				
Factor	Level	LS Mean	Standard Error	N
DAYTRIP\$	0.000000	419.71851	61.88362	9.00000
DAYTRIP\$	1.000000	615.56668	65.75402	8.00000

\* Means are computed after adjusting covariate effect.

**WARNING**

Case 1 is an Outlier (Studentized Residual : 2.91718)

Durbin-Watson D-Statistic	1.57310
First Order Autocorrelation	0.02860

Information Criteria	
AIC	230.06441
AIC (Corrected)	233.39774
Schwarz's BIC	233.39726

## Example Management Measure for Distributing ACE to Defray Monitoring Costs

### Enclosure (2) Draft ACE Distribution to Defray Monitoring Costs

#### Option 1 – No Action

{TBD}

#### Option 2 –

Each sector (including the common pool) that incurs monitoring costs (i.e. lease only sectors and state permit banks will not be provided additional ACE to defray monitoring costs) will be provided ACE to help defray the costs of sector monitoring programs. The additional ACE will be provided from one of two sources:

- Sub-Option A: A percentage of the sub-ACL for commercial groundfish vessels
- Sub-Option B: A percentage of the difference between the ACL and the ABC for commercial groundfish vessels.

{Need to specify how percentage is determined}

Once the amount of each stock available is determined, it will be distributed to the sectors and common pool in one of the following ways.

Sub Option C: The additional monitoring ACE will be distributed in proportion to each group's ACE. As an example, if a sector received 5 percent of the overall ACE for stock A, it will receive 5 percent of the amount available to defray monitoring costs.

Sub-Option D: The additional monitoring ACE will be distributed in proportion to the distribution of monitoring costs in the previous fishing year. As an example, if a sector incurred 5 percent of the total monitoring costs in the previous fishing year, the sector would receive 5 percent of the amount available to defray monitoring costs.

Sub-Option E: The monitoring cost per pound caught in the previous fishing year will be calculated for each sector (including the common pool). The sectors will be ranked in order of cost per pound with the lowest ranked sector at 1. Each sector (or the common pool) will receive a share for the available ACE calculated as:

$$\text{Share} = \text{Sector Rank} / (\text{Sum of all ranks})$$

The ACE provided by the sectors will be leased to defray the monitoring costs of the sector. The ACE can be leased within the sector, or can be leased to another sector. Each sector can determine lease prices in any manner chosen by the sector.

In the sector's annual report, a full accounting will be made of all leases of the funding ACE. This report will include the amounts (pounds) of each stock leased, the revenues obtained from that lease, whether the lease was internal or external to the sector, and if an external lease the receiving sector will be identified.

Table 5 – Example funding distribution based on strawmun sub-options for using extra ACE to defray monitoring costs

Sector	Cost/ Pound Caught	Sub- Option C Percent of PSC	Sub-Option D Percent of Monitoring Costs	Sub-Option E Ranked Cost/ Pound Caught	Example Monitoring ACE Value	Sub- Option C Percent of PSC	Sub-Option D Percent of Monitoring Costs	Sub-Option E Ranked Cost/ Pound Caught	Adjusted Cost/ Pound Caught Sub-Option C	Adjusted Cost/ Pound Caught Sub-Option D	Adjusted Cost/ Pound Caught Sub-Option E
CP	0.14	2.2%	4.0%	6.5%	1,100,000	\$23,760	\$43,700	\$71,895	\$0.12	\$0.11	\$0.10
GBFG	0.27	7.2%	9.8%	10.5%	1,100,000	\$79,310	\$108,211	\$115,033	\$0.24	\$0.23	\$0.22
SHS1	0.06	28.9%	23.3%	1.3%	1,100,000	\$318,010	\$256,102	\$14,379	\$0.05	\$0.05	\$0.06
PCCS	0.17	1.9%	2.9%	7.8%	1,100,000	\$21,010	\$31,429	\$86,275	\$0.15	\$0.14	\$0.09
NE VII	0.13	4.8%	4.5%	5.2%	1,100,000	\$52,800	\$49,529	\$57,516	\$0.11	\$0.11	\$0.10
NE VIII	0.07	5.7%	3.4%	2.6%	1,100,000	\$62,150	\$36,889	\$28,758	\$0.05	\$0.05	\$0.06
NE XI	0.13	2.7%	6.2%	5.9%	1,100,000	\$29,370	\$68,484	\$64,706	\$0.12	\$0.11	\$0.11
NE XII	0.16	0.9%	0.3%	7.2%	1,100,000	\$9,680	\$3,815	\$79,085	\$0.09	\$0.14	-\$0.43
NE II	0.07	11.4%	11.3%	3.3%	1,100,000	\$125,400	\$124,429	\$35,948	\$0.06	\$0.06	\$0.07
NE III	0.21	2.8%	9.1%	9.2%	1,100,000	\$30,250	\$99,610	\$100,654	\$0.20	\$0.17	\$0.17
NE X	0.26	1.6%	3.7%	9.8%	1,100,000	\$17,050	\$40,328	\$107,843	\$0.24	\$0.21	\$0.14
NE XIII	0.08	10.3%	4.7%	3.9%	1,100,000	\$113,410	\$52,111	\$43,137	\$0.05	\$0.07	\$0.07
NE IX	0.06	9.2%	8.8%	2.0%	1,100,000	\$100,980	\$96,905	\$21,569	\$0.05	\$0.05	\$0.06
NE V	0.21	4.4%	4.9%	8.5%	1,100,000	\$47,850	\$53,782	\$93,464	\$0.18	\$0.17	\$0.15
TSS	0.08	1.9%	0.9%	4.6%	1,100,000	\$20,570	\$9,860	\$50,327	\$0.05	\$0.07	\$0.01
NE VI	0.04	3.4%	2.0%	0.7%	1,100,000	\$37,180	\$21,473	\$7,190	\$0.03	\$0.03	\$0.04
NCCS	1.94	1.0%	0.3%	11.1%	1,100,000	\$11,110	\$3,344	\$122,222	\$0.82	\$1.60	-\$10.37

## Enclosure (4)

### FW 47 Area based AMs for Halibut and Wolffish

#### Atlantic halibut

The groundfish fishery AM for Atlantic halibut would be implemented if the total ACL (as opposed to the groundfish sub-ACL) is projected to be exceeded. Should a sub-ACL be allocated to other fisheries and AMs developed for those fisheries, the AMs for either (or both) fisheries will be implemented only if the total ACL for the stock is exceeded. If only one fishery exceeds its sub-ACL the AM will be implemented only for that fishery. Note that for this stock a specific area-based measure becomes effective only if catches exceed the ACL by more than the allowance for management uncertainty. In effect, the area-based measures are effective if the ABC is exceeded.

If the AM is implemented trawl vessels would be required to use approved selective trawl gear that reduces the catch of flounders and retention of Atlantic halibut would be prohibited. Approved gears include the separator trawl, Ruhle trawl, mini-Ruhle trawl, rope trawl, and other gear authorized by the Council in a management action or approved for use consistent with the process defined in 50 CFR 648.85 (b)(6).

If the AM is implemented, sink gillnet and longline vessels would not be allowed to fish in the AM areas described below. Should selective gear be developed that reduces catches of these species then fishing would be allowed in these areas as long as the gear is used. Such gear must be approved through the process used to authorize selective trawl gear before it is authorized for use.

**Areas:** The areas are designed to account for an ACL overage of up to 20 percent. The areas would be implemented for ACL overages that are between the management uncertainty buffer and 20 percent.

The applicable areas where trawl gear restrictions would apply are shown in Figure 4.

The areas where sink gillnet and longline fishing would be prohibited (or if selective gear is developed, where use of the gear would be required) are also shown in Figure 4.

#### Trawl Gear Halibut AM Area

42-00N 69-20W  
42-00N 68-20W  
41-30N 68-20W  
41-30N 69-20W

#### Fixed Gear Halibut AM areas

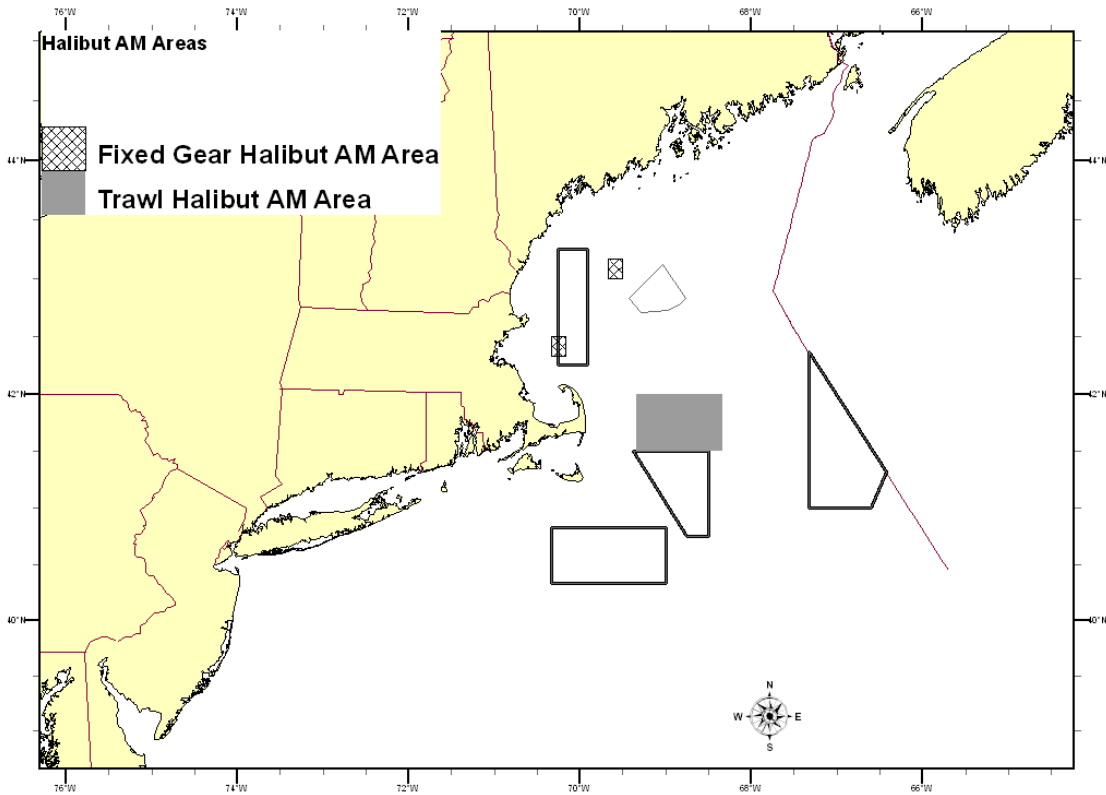
41-40N 69-40W  
41-40N 69-30W  
41-30N 69-30W  
41-30N 69-40W

And

43-10N 69-40W  
43-10N 69-30W

43-00N 69-30W  
43-00N 69-40W

**Figure 4 – Proposed AM areas for fixed gear and trawl vessels for halibut.**



### **Atlantic Wolffish**

The groundfish fishery AM for Atlantic wolffish would be implemented if the total ACL (as opposed to the groundfish sub-ACL) is projected to be exceeded. Should a sub-ACL be allocated to other fisheries and AMs developed for those fisheries, the AMs for either (or both) fisheries will be implemented only if the total ACL for the stock is exceeded. If only one fishery exceeds its sub-ACL the AM will be implemented only for that fishery. Note that for this stock a specific area-based measure becomes effective only if catches exceed the ACL by more than the allowance for management uncertainty. In effect, the area-based measures are effective if the ABC is exceeded.

If the AM is implemented trawl vessels would be required to use approved selective trawl gear that reduces the catch of demersal species. Approved gears include the separator trawl, Ruhle trawl, mini-Ruhle trawl, rope trawl, and other gear authorized by the Council in a management action or approved for use consistent with the process defined in 50 CFR 648.85 (b)(6).

If the AM is implemented, sink gillnet and longline vessels would not be allowed to fish in the AM areas described below. Should selective gear be developed that reduces catches of these species then fishing would be allowed in these areas as long as the gear is used. Such gear must be approved through the process used to authorize selective trawl gear before it is authorized for use.



The AM measures would be in effect from May through December, and in April. The measures would not be in effect from January through March because the habits of wolffish make it less susceptible to fishing at that time.

**Areas:** The areas are designed to account for an AM overage of up to 20 percent. The areas would be implemented for ACL overages that are between the management uncertainty buffer and 20 percent.

The applicable areas where trawl gear restrictions would apply are shown in Figure 5.

The areas where sink gillnet and longline fishing would be prohibited (or if selective gear is developed, where use of the gear would be required) are shown in Figure 5.

#### Trawl Wolffish AM Area

42-30N 70-30W  
42-30N 70-15W  
42-15N 70-15W  
42-15N 70-10W  
42-10N 70-10W  
42-10N 70-20W  
42-20N 70-20W  
42-20N 70-30W

#### Fixed Gear Wolffish AM Area

41-40N 69-40W  
41-40N 69-30W  
41-30N 69-30W  
41-30N 69-40W

And

42-30N 70-20W  
42-30N 70-15W  
42-20N 70-15W  
42-20N 70-20W

**Figure 5 – Proposed AM areas for fixed gear and trawl gear for wolffish. Note the AM areas overlap on the western side of the WVGOM closed area.**

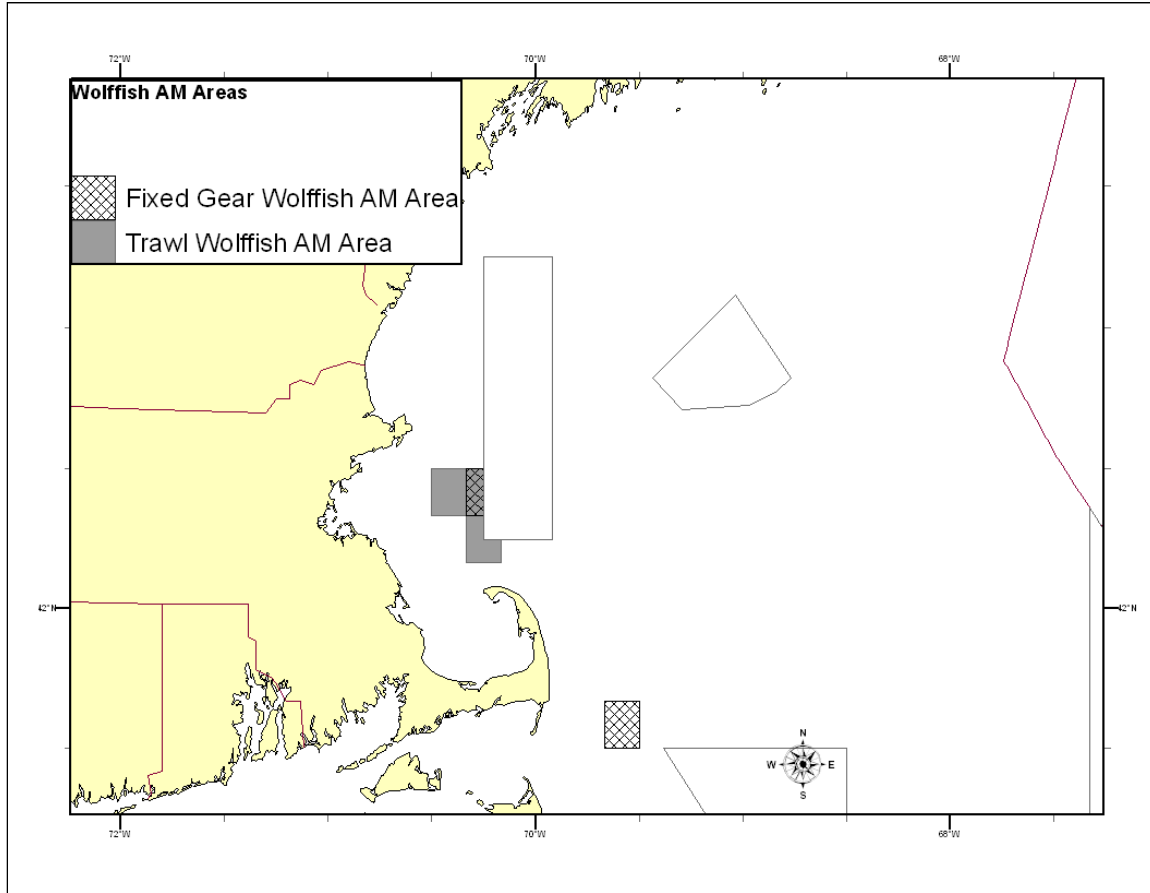


Figure 8 – Example SNE/MA areas for an AM

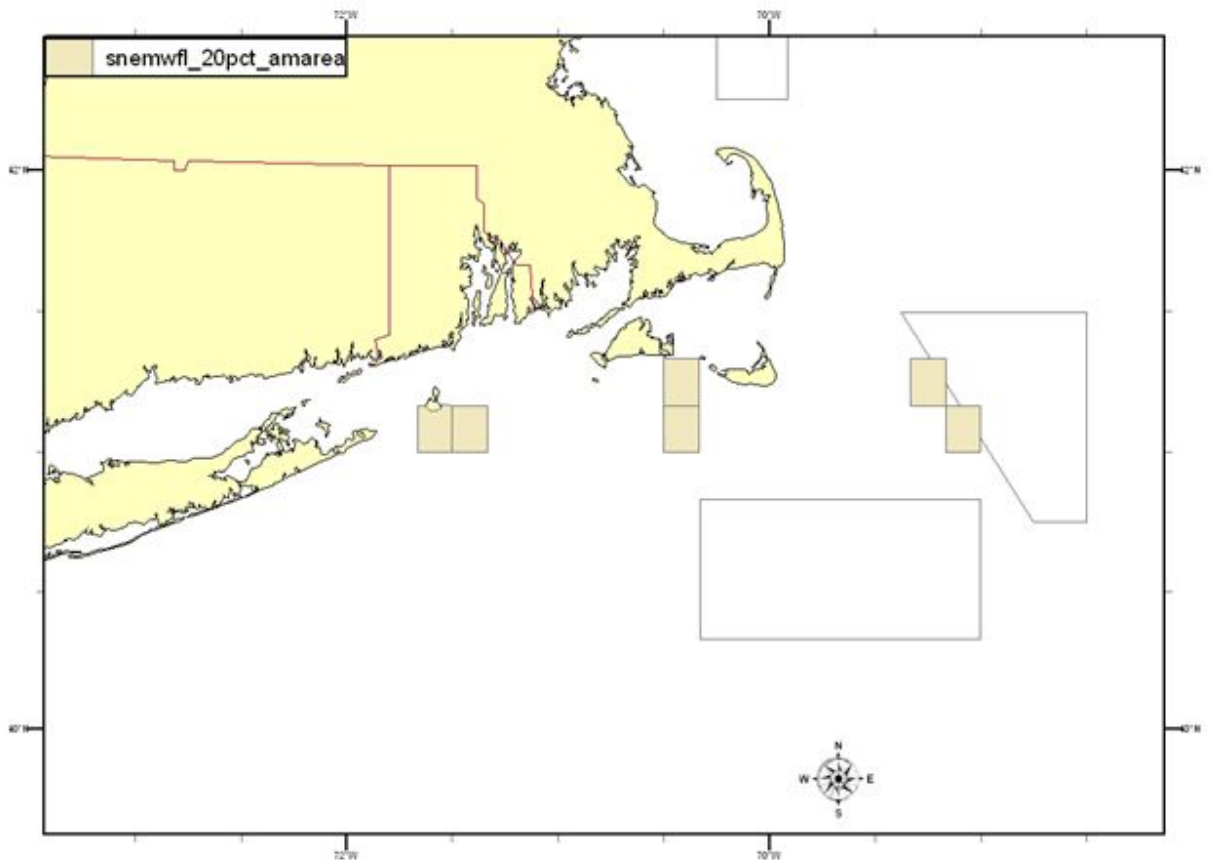


Table 6 – PRELIMINARY FY 2011 groundfish catch accounting. See notes on following page.

**FY 2011 End of Year Accounting of NE Multispecies Catch (mt)**

\*\*\*Preliminary - Still in Review \*\*\*

Stock	ACLs and sub-ACLs; (with accountability measures (AMs))							sub-components: No AMs	
	Total Groundfish	Groundfish Fishery	Sector	Common Pool	Recreational	Herring Fishery	Scallop Fishery	State Water	Other
	A to G	A+B+C	A	B	C	D	E	F	G
GB cod	3,576.0	3,283.6	3,221.6	62.0				48.0	244.4
GOM cod	6,850.6	6,210.1	4,402.0	96.8	1,711.3			597.0	43.5
GB Haddock	4,904.6	3,843.3	3,831.6	11.7		101.2		342.0	618.2
GOM Haddock	759.5	746.3	498.7	2.0	245.6	2.6		9.0	1.7
GB Yellowtail Flounder	1,117.2	982.6	980.6	2.0			97.8	0.0	36.8
SNE/MA Yellowtail Flounder	519.7	383.4	370.9	12.5			96.5	7.0	32.7
CC/GOM Yellowtail Flounder	863.2	820.7	808.7	11.9				10.0	32.5
Plaice	1,742.3	1,646.0	1,641.4	4.6				34.0	62.3
Witch Flounder	1,167.0	1,000.4	996.1	4.3				14.0	152.5
GB Winter Flounder	2,006.8	1,924.6	1,923.5	1.1				0.0	82.2
GOM Winter Flounder	226.1	163.4	160.5	2.9				60.0	2.7
SNE/MA Winter Flounder	322.3	105.0	97.7	7.3				72.0	145.3
Redfish	2,864.6	2,689.8	2,686.1	3.6				84.0	90.8
White Hake	3,123.9	3,072.8	3,054.5	18.3				33.0	18.0
Pollock	9,367.0	7,670.0	7,599.8	70.2				769.0	928.1
Northern Windowpane	193.2	157.1	156.8	0.3				2.0	34.1
Southern Windowpane	528.5	115.4	85.2	30.1				2.0	411.1
Ocean Pout	111.2	60.9	56.5	4.5				3.0	47.2
Halibut	91.1	42.9	41.8	1.1				39.0	9.2
Wolffish	38.3	33.1	32.3	0.8				1.0	4.2

Values in live weight

Sector and common pool include estimate of missing dealer reports

Source: NMFS Northeast Regional Office

May 25, 2012, run date of May 10, 2012

These data are the best available to NOAA's National Marine Fisheries Service (NMFS). Data sources for this report include: (1) Vessels via VMS; (2) Vessels via vessel logbook reports; (3) Dealers via Dealer Electronic reporting. Differences with previous reports are due to corrections made to the database.

Sector/Common Pool	- from DMIS - FY11 waves, estimate Mar./Apr. 2012 wave using Mar./Apr. 2011
Rec - GOM Cod	- FY11 waves, estimate Mar./Apr. 2012 wave using Mar./Apr. 2011
Rec - GOM Haddock	- approx. from monitoring reports
Herring	For GBYT, SNE YT, GB Winter, SNE Winter, S. Windowpane: - FY11 Scallop Est. = FY11 Kall * disc rate from Feb. '11 to Jan. '12
Scallop	For all others stocks: - CY11 Scallop Est. = CY11 Kall * disc rate from Nov. '10 to Oct. '11
State Water	- FY11 subcomponent value
Other subcomponent:	- FY11 non-scallop Kall*non-scallop disc rate from Feb. '11 through Jan. '12 + scallop where included respectively.