Framework 47 Errata and Additions

November 13, 2011

Revisions are underlined

Economic Impacts of ACLs (page 145)

6.4.1.5 Annual Catch Limit Specifications

This measure considers two options. Option /No Action would leave the specifications as adopted by FW 44 and FW 45. Option 2 would adopt new specifications for the three winter flounder stocks, the two windowpane flounder stocks, ocean pout, GB yellowtail flounder, and GOM cod. Because specifications for GOM cod will not be determined until the assessment results are available in January 2012, this action considers a range of ABCs for GOM cod.

GOM cod is a key component of the catches from the GOM and the size of the GOM cod ABC may influence the ability to catch other stocks. For this reason, the analyses presented here are conducted for three levels of GOM cod catches: Option 1 (No Action), Option 2 (Revised ACLs, Low), and Option 2 (Revised ACLs, High). This analysis will focus on Sector vessels, which constitute greater than 98% of the commercial groundfish fishery. Most ACE allocations are remain scheduled to remain relatively stable from 2011 to 2012 for all options, but stocks such as Georges Bank yellowtail flounder and, potentially, Gulf of Maine cod, will see important decreases in FY 2012 (Table 1).

Overall, Option 1 and Option 2-High are predicted to have net positive economic impacts in aggregate, though Rhode Island and New York may see declines in gross revenues from groundfish under both Options. Option 2-Low will have negative economic impacts across all ports, size classes and gear types. Small vessels in the inshore Gulf of Maine are predicted to be most adversely affected. Under this Option, New Hampshire is predicted to lose over 90% of its gross revenues relative to FY 2010 though some of that lost revenue will be compensated by ACE leasing and declines in operating expenses as vessels chose not to fish.

Table 1 –Sector ACE allocations FY2010 – 2012, live pounds

SPECIES	STOCK	Sector ACE		Sector ACE 2012		
		2010	*2011*	*Option 1*	*Option 2-Low*	*Option 2-High*
American plaice		5,836,518	6,697,766	6,761,576	7,063,609	7,063,609
Cod	GB	7,008,304	9,277,222	10,244,878	9,934,027	9,934,027
	GOM	9,355,985	10,408,214	10,414,634	577,611	23,097,825
Haddock	GB	83,914,795	67,575,126	56,458,165	60,120,042	60,120,042
	GOM	1,683,057	1,717,432	1,388,912	1,426,390	1,426,390
Halibut						
Ocean pout						
Pollock		34,156,917	30,530,173	27,826,739	27,597,458	27,597,458
Redfish		14,109,702	16,545,996	17,727,366	18,265,293	18,265,293
White hake		5,292,674	6,494,937	6,896,058	7,169,431	7,169,431
Windowpane	North					
	South					
Winter flounder	GB	3,980,218	4,393,893	4,909,693	7,416,348	7,416,348
	GOM	288,899	330,699	291,010	1,496,938	1,496,938
	SNEMA					

Witch flounder		1,745,117	2,669,847	3,099,699	3,128,359	3,128,359
Wolffish						
Yellowtail flounder	CCGOM	1,581,720	2,012,857	2,151,711	2,239,896	2,239,896
	GB	1,738,477	2,473,632	1,467,617	471,789	471,789
	SNE	504,685	890,684	1,216,973	1,289,727	1,289,727
GRAND TOTAL		**171,197,068**	**162,018,479**	**150,855,030**	**148,196,919**	**170,717,133**

Analyzing impacts using a quota change model

To analyze potential impacts on vessels enrolled in the Sector program a linear programming technique is used, where a model attempts to maximize the catch of all stocks conditioned on the technology, fishing practices and jointness of production across stocks that existed during FY 2010. An approach like this is necessary because it is not enough to assume that all allocated ACE will be converted into catch and scale anticipate revenues accordingly. Performance during the first year of quota-based fishing demonstrated that either existing technology is insufficient to allow for targeting stocks with excess ACE capacity, or alternatively ACE allocations exceed resource availability (Table 2).

Nor should we assume that changes in aggregate ACE allocations will scale linearly with revenues—that merely allocating more fish (or less) will result in generating more or less gross revenues. For example, critical stocks such as white hake and GOM cod, both of which were somewhat constraining in FY2010, may see ACE allocations moving in opposite directions under Option 2-Low, with white hake increasing and GOM cod decreasing by nearly 95%. Option 1, which maintains allocations for most stocks, contains a roughly 40% reduction in the GB yellowtail flounder allocation. Option 2-High, on paper perhaps the most liberal of the three Options, includes an 80% reduction for this important stock. Jointness of production (the catch of several stocks simultaneously) ensures that increases and/or restrictions on the catch of one stock will have impacts on the catchability of all others, though technologies such as modified gears and improved electronics may help to overcome some of these limitations.

Table 2 – FY 2010 ACE allocations and catch for sector vessels

SPECIES	STOCK	ACE	2010 Catch	Utilization
American plaice		5,836,518	3,336,272	57%
Cod	GB	7008304	6,000,952	86%
	GOM	9,355,985	7,911,669	85%
Haddock	GB	83,914,795	18,266,338	22%
	GOM	1,683,057	818,239	49%
Halibut				
Ocean pout				
Pollock		34,156,917	11,483,386	34%
Redfish		14,109,702	4,702,621	33%
White hake		5,292,674	4,951,889	94%
Windowpane	North			
	South			
Winter flounder	GB	3,980,218	3,048,553	77%
	GOM	288,899	176,784	61%
Witch flounder	SNEMA	1,745,117	1,540,038	88%

Wolffish				
	CCGOM	1,581,720	1,233,481	78%
Yellowtail flounder	GB	1,738,477	1,632,512	94%
	SNE	504,685	351,362	70%
GRAND TOTAL		**171,197,068**	**65,454,096**	**38%**

The basic method of analysis used here is to draw from existing (FY 2010) fishing trips in an effort to predict future catch and gross revenues based on the proposed changes in ACE allocations. VTR data is adjusted by average sector-specific discard rates and landed/live pound conversions such that every VTR trip has a corresponding catch, the sum of landings and discards, and gross revenue. Metrics such as gear type, vessel size and hailing port/state are maintained. These records are scaled to match official dealer reporting on a species and stock level. The model simulates one year of fishing by randomly selecting and arraying trips from the database and summing the catches until one allocated stocks hits its limit. At this point the total landings for all stocks are recorded. 100 simulated fishing years are run, and the results are reported at the 95th percentile. Results are reported in terms of gross groundfish revenues, and constant 2010 dollars.

The model is tested in two ways. First the 2010 fishing year was modeled. The model was able to recreate the fishing year almost perfectly at the stock level, but the hail port/state distributions vary somewhat from official statistics for ports in Maine and New Hampshire. There are two reasons for this discrepancy. One is error inherent in randomly drawing trips from the year—some trips may be selected multiple times while others are not selected at all. The second is from the level of reporting—VTR in the case of the model, and DEALER for official statistics. These data seldom match perfectly.

For the purposes of model verification, the limits were set at actual catches but were relaxed for the two haddock stocks and both SNE winter and yellowtail flounders.

Table 3 – Predicted and actual catch across stocks, quota change model

# runs = 100		CATCH			GROSS REVENUE	
SPECIES	**STOCK**	**PREDICTED**	**REALIZED**	***pct***		**PREDICTED**
American plaice		3,333,569	3,336,272	*99.9%*	$	4,326,759
Cod	GB	5,901,463	6,000,952	*98.3%*	$	15,216,177
	GOM	7,563,990	7,911,669	*95.6%*	$	10,896,663
Haddock	GB	18,088,804	18,266,338	*99.0%*	$	19,955,918
	GOM	886,730	818,239	*108.4%*	$	756,419
Halibut		59,816	59,822	*100.0%*	$	257,315
Ocean pout		134,992	138,861	*97.2%*	$	1,354
Pollock		11,061,692	11,483,386	*96.3%*	$	9,635,132
Redfish		4,698,527	4,702,621	*99.9%*	$	2,451,241
White hake		4,595,906	4,951,889	*92.8%*	$	4,487,637
Windowpane	North	333,465	333,507	*100.0%*	$	74,719
	South	238,302	238,387	*100.0%*	$	1,495
Winter flounder	GB	3,041,799	3,048,553	*99.8%*	$	5,805,730
	GOM	172,953	176,784	*97.8%*	$	306,702
	SNEMA	137,031	130,332	*105.1%*	$	885,233

Witch flounder		1,506,511	1,540,038	*97.8%*	$	3,507,958
Wolffish		37,444	38,315	*97.7%*	$	346
Yellowtail flounder	CCGOM	1,232,875	1,233,481	*100.0%*	$	679,399
	GB	1,630,973	1,632,512	*99.9%*	$	3,153,248
	SNE	348,320	351,362	*99.1%*	$	86,656
GRAND TOTAL		**65,005,162**	**66,393,320**	***97.9%***		***97.9%***
			Realized gross revenue:		***$***	***83,293,667***
						(99%)

To assess the model's predictive ability, we attempted to predict FY2011 fishing catches to date. The model was run to predict a complete year of data starting in September 2010 and running through the beginning of September 2011—approximately five months of data from the new fishing year. In aggregate the model was able to predict 90% of the catches and revenues realized during this timeframe. It overestimated GB haddock and SNE winter flounder while underestimating GOM cod and white hake. This is likely due to seasonality, as May-May data are being used to predict a Sept-Sept fishing event. Nonetheless, the ability to predict a reasonable portion of out-of-sample data is important.

Table 4 – Model prediction of September 2010 – September 2011 catches and revenues.

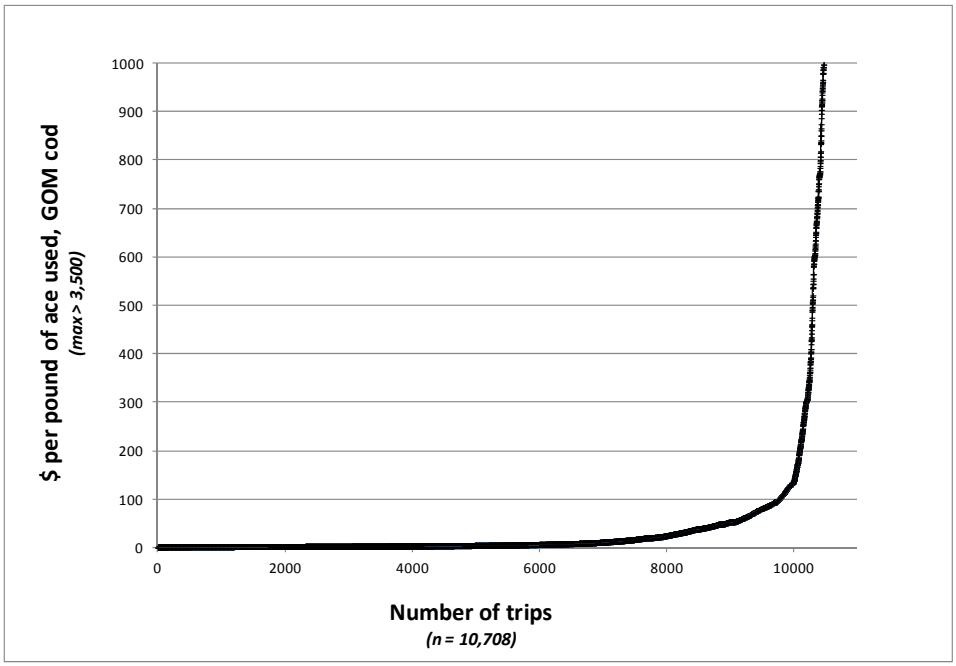
# runs = 100		**CATCH**			**GROSS REVENUE**		
SPECIES	**STOCK**	**PREDICTED**	**REALIZED**	***pct***	**PREDICTED**	**REALIZED**	***pct***
American plaice	all	1,485,980	1,485,998	*100%*	$ 1,886,735	$ 1,656,503	*114%*
Cod	GB	2,661,290	3,860,998	*69%*	$ 6,216,661	$ 9,919,553	*63%*
	GOM	3,795,779	4,650,138	*82%*	$ 5,225,442	$ 6,500,409	*80%*
Haddock	GB	9,453,456	6,323,512	*149%*	$ 9,586,750	$ 6,325,455	*152%*
	GOM	248,073	218,691	*113%*	$ 184,840	$ 170,196	*109%*
Halibut	all	31,108	31,290	*99%*	$ 134,642	$ 221,798	*61%*
	all						
Ocean pout	all	61,617	69,473	*89%*	$ -	$ 9	*0%*
Pollock	all	4,842,664	6,008,281	*81%*	$ 3,943,598	$ 5,028,640	*78%*
Redfish	all	2,363,609	2,374,441	*100%*	$ 1,176,396	$ 1,205,454	*98%*
White hake	all	1,422,817	2,357,638	*60%*	$ 1,471,277	$ 2,481,970	*59%*
Windowpane	North	149,280	166,308	*90%*	$ 2,035	$ 93,038	*2%*
	South	106,002	143,916	*74%*	$ 47	$ 13,641	*0%*
Winter flounder	GB	2,119,578	3,531,225	*60%*	$ 4,060,937	$ 4,629,856	*88%*
	GOM	44,022	95,404	*46%*	$ 88,335	$ 143,061	*62%*
	SNEMA	78,450	67,447	*116%*	$ 654,854	$ 234,099	*280%*
Witch flounder	all	623,055	847,002	*74%*	$ 1,547,061	$ 1,547,901	*100%*
Wolffish	all	19,237	23,531	*82%*	$ -	$ 3	*0%*
Yellowtail flounder	CCGOM	345,835	449,372	*77%*	$ 172,618	$ 178,947	*96%*
	GB	731,394	1,150,234	*64%*	$ 1,151,655	$ 1,602,819	*72%*
	SNE	109,298	76,523	*143%*	$ 14,089	$ 2,157	*653%*
GRAND TOTAL		**30,692,546**	**33,931,422**	***90%***	**$ 37,517,971**	**$ 41,955,505**	***89%***

Marginal changes in quota allocations on the order of 15% or less are relatively straightforward to model as they are not likely to induce significant changes in fishing behavior or the use of technology. Rather we would expect to see continuous improvements in how fishermen use their quota and improve their fishing practices under the quota-based management system. However, two non-marginal changes in the proposed Options stand out. The first is the GB yellowtail flounder allocation, which is reduced by 40% from FY 2011 under Option 1 and 81% under Options 2 Low and High. The second is the 95% reduction in GOM cod allocations under Option 2-Low.

Both of these changes are drastic. To model such non-marginal changes is difficult at best. However, it is logical that fisherman will change their behavior to whatever degree they may in order to redirect their efforts on stocks for which they have ample quota. First we then need to understand to what degree fisherman can avoid these two stocks while still fishing. To do this, we look at the ratio of GOM cod and/or GB yellowtail ACE expended to the gross revenue from all species generated by that quota. Essentially the question is "how much money can be generated per pound of ACE?"

Figure 1 shows how fisherman used their cod ACE in 2010. A few things stand out. First, the more than 70% of GOM cod trips generate less than $7.50 for every pound of GOM cod ACE. This indicates that most vessels catching GOM cod are targeting it rather than using it to leverage catches of other stocks. A small minority of trips, on the order of 20%, generate more than $10 per pound of GOM cod ACE. Under a drastically reduced GOM cod quota, these are the trips that are most likely to continue. To re-calibrate the model to accommodate such a dramatic change in available quota, all trips that generated less than $12.50 per pound of GOM cod ACE were assumed not to occur in FY 2012. This was the level that optimized the catch of all other stocks conditioned on both this and the GB yellowtail constraints. Put another way, fisherman will in all likelihood need to generate on the order of $12.50 per pound of GOM cod ACE or more to effectively target other stocks.

Figure 1 – Dollars generated per pound of GOM cod ACE for all trips catching GOM cod in FY 2010.

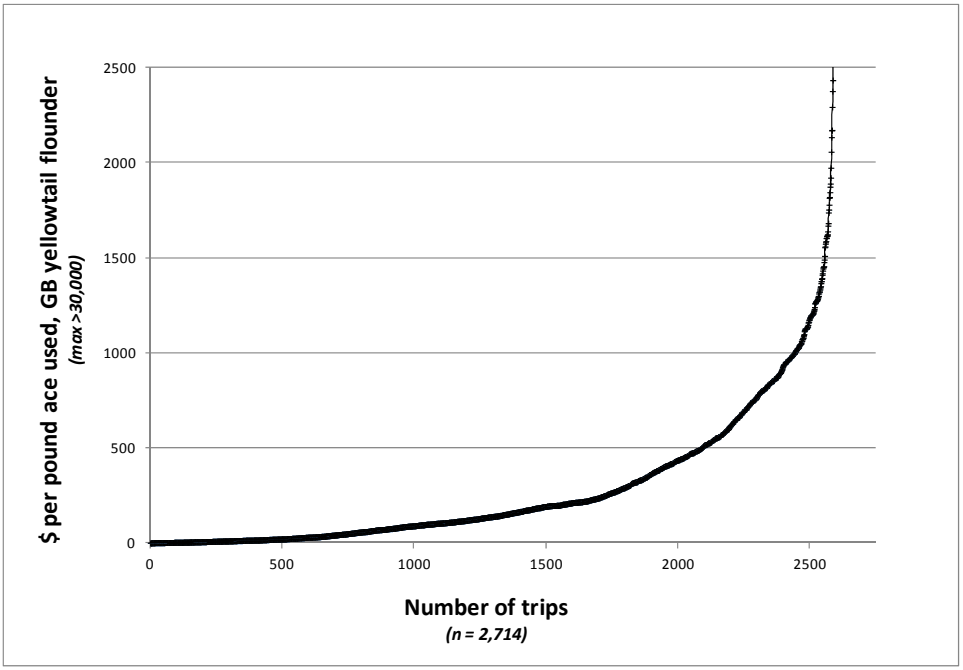


A similar problem is posed by GB yellowtail flounder. However,

Figure 2 shows that fisherman on Georges Bank use their yellowtail flounder ACE much differently than GOM fishermen use their cod ACE. Only about 15% of trips on Georges Bank generated $10 or less in gross revenue per pound of yellowtail ACE exhausted. As previously stated, the equivalent percentage for GOM cod was 70%. This indicates that far more fishing trips are able to leverage their GB yellowtail flounder quota in the service of catching other stocks. In fact, on over half the trips reported as taking place on Georges Bank, fisherman were able to generate in excess of $100 per pound of yellowtail ACE. GB yellowtail is, then, much easier to avoid than GOM cod. To optimize the catch of other stocks, we use $25 generated per pound of ACE as the threshold for excluding trips from the model for both Option 2-Low and High. Importantly, when trips are omitted from the model other included trips will be selected with a higher probability, changing not only the distribution of the catch but the distribution of the vessels catching it.

No other quota changes were significant enough to warrant modifications of the FY 2010 data set of fishing trips for use in the model.

Figure 2 – Dollars generated per pound of GB yellowtail flounder ACE for all trips catching GB yellowtail flounder in FY 2010.



Analysis of aggregate impacts

Option 1 is predicted to generate the highest gross groundfish revenue at $112 million, assuming prices remain constant at 2010 levels. Option 2-High is estimated to generate about 12% less gross revenue from groundfish than Option 1, at $101.5 million. Both options are predicted to generate positive economic impacts in aggregate. Higher quotas for binding stocks like white hake and GOM cod translate into 20-30% higher gross groundfish revenues relative to the most recent completed fishing year. (FY 2010, $83 million).

Option 2-Low is estimated to have a negative economic aggregate impact, reducing gross groundfish revenues by approximately 25% relative to FY2010 and 50% relative to Option 1.

It is difficult to determine whether or not these estimates are too high or too low. At first glance it may seem unrealistic that Option 2-Low could result in sustained catches for other GOM species such as plaice and witch flounder and produce only 25% less gross revenue from groundfish than observed in FY 2010. Yet the existing trip information indicates it is possible. The conditions that allowed those high-revenue-per-cod trips to happen (environmental, abundance, etc) must obviously persist, or be replicable. Further, there is every reason to believe that given as strong an incentive to avoid GOM cod as Option 2 will provide fishermen will become even more adept at maximizing their cod ACE-to-revenue ratio, using improved technology and/or skill to allow even higher catches of non-binding stocks than the model predicts.

Option 2-High may be even the most difficult to predict, though for an opposing reason--there are simply not enough trips with high GOM cod catch to allow the model to catch 23 million pounds. Without assuming significant increases in catch per unit effort on this stock (which seem unlikely given the targeted nature of most cod fishing in the Gulf of Maine) the model simply could not catch all the cod.

Table 5 – Predicted catch and gross revenue, Options 1, 2 Low and 2 High.

# runs = 250		CATCH				CATCH				CATCH			
SPECIES	**STOCK**	***PREDICTED***	***SECTOR ACE***	***pct***	**GROSS REVENUES**	***PREDICTED***	***SECTOR ACE***	***pct***	**GROSS REVENUES**	***PREDICTED***	***SECTOR ACE***	***pct***	**GROSS REVENUES**
American plaice		4,555,823	6,761,576	*67%*	$ 5,861,764	3,224,950	7,063,609	*46%*	$ 4,240,364	4,414,191	7,063,609	*62%*	$ 5,797,353
Cod	GB	8,598,489	10,244,878	*84%*	$ 22,466,502	5,629,079	9,934,027	*57%*	$ 14,551,700	6,945,753	9,934,027	*70%*	$ 18,096,727
	GOM	10,286,800	10,414,634	*99%*	$ 14,854,483	577,291	577,611	*100%*	$ 811,609	10,071,773	23,097,825	*44%*	$ 14,522,636
Haddock	GB	24,984,267	56,458,165	*44%*	$ 27,430,522	15,742,097	60,120,042	*26%*	$ 17,216,690	19,290,494	60,120,042	*32%*	$ 20,967,428
	GOM	1,146,057	1,388,912	*83%*	$ 1,057,557	678,543	1,426,390	*48%*	$ 554,481	1,418,209	1,426,390	*99%*	$ 1,221,174
Halibut		81,735	-	-	$ 318,590	50,913	-	-	$ 207,816	73,322	-	-	$ 344,376
Ocean pout		192,103	-	-	$ 939	132,556	-	-	$ 338	163,837	-	-	$ 1,261
Pollock		16,009,575	27,826,739	*58%*	$ 14,024,913	9,470,989	27,597,458	*34%*	$ 8,045,332	14,784,328	27,597,458	*54%*	$ 12,916,807
Redfish		7,340,072	17,727,366	*41%*	$ 3,766,582	4,549,371	18,265,293	*25%*	$ 2,341,542	6,092,781	18,265,293	*33%*	$ 3,219,909
White hake		6,152,143	6,896,058	*89%*	$ 6,077,986	4,365,190	7,169,431	*61%*	$ 4,253,578	6,080,081	7,169,431	*85%*	$ 5,782,972
Windowpane	North	467,271	-	-	$ 49,183	276,778	-	-	$ 31,671	413,660	-	-	$ 61,438
	South	337,903	-	-	$ 590	254,766	-	-	$ 1,128	316,674	-	-	$ 519
Winter flounder	GB	4,419,436	4,909,693	*90%*	$ 8,414,458	2,073,581	7,416,348	*28%*	$ 3,928,710	2,754,011	7,416,348	*37%*	$ 5,295,500
	GOM	248,828	291,010	*86%*	$ 438,316	71,961	1,496,938	*5%*	$ 123,453	228,797	1,496,938	*15%*	$ 410,320
	SNEMA	176,573	-	-	$ 823,166	151,147	-	-	$ 866,648	151,814	-	-	$ 563,025
Witch flounder		2,132,350	3,099,699	*69%*	$ 5,015,256	1,262,195	3,128,359	*40%*	$ 2,897,564	2,049,469	3,128,359	*66%*	$ 4,729,652
Wolffish		53,415	-	-	$ 233	32,589	-	-	$ 2	47,853	-	-	$ 236
Yellowtail flounder	CCGOM	1,710,901	2,151,711	*80%*	$ 912,610	861,911	2,239,896	*38%*	$ 471,702	1,812,185	2,239,896	*81%*	$ 995,570
	GB	1,467,353	1,467,617	*100%*	$ 2,498,444	397,078	471,789	*84%*	$ 514,586	450,828	471,789	*96%*	$ 567,359
	SNE	443,806	1,216,973	*36%*	$ 104,786	327,159	1,289,727	*25%*	$ 71,660	477,359	1,289,727	*37%*	$ 113,136
GRAND TOTAL		**90,804,899**	**150,855,030**	***60%***	**$ 114,116,878**	**50,130,142**	**148,196,919**	***34%***	**$ 61,130,575**	**78,037,421**	**170,717,133**	***46%***	**$ 95,607,397**

Distributional impacts

Option 1 and Option 2-High are both likely to have positive net benefits relative to FY 2010 across all hailing ports and states with the exception of Rhode Island and New York, which are predicted to lose roughly 30-70% of gross revenues under these two options. The loss of a commercial fishery for SNE winter flounder appears to continue to affect the medium sized vessels (50-70 feet) from this port, and may be the reason for the substantial predicted under-harvest of SNE yellowtail flounder. The model predicts that the largest size class vessels may see a nearly 50% reduction in gross groundfish revenues but the reason for this is unclear. Impacts across vessel size classes and gear types appear to be uniformly positive for these two Options.

Option 2-Low will have a negative economic impact across all size classes, gear types and nearly all hailing ports. The exception to this appears to be Chatham, which is predicted to essentially maintain its revenue from groundfish. Behind Chatham, Boston is the only other port that is predicted to see a decline in gross groundfish revenues of less than 25%. New Hampshire is predicted to be the hardest hit by the GOM cod quotas, losing over 90% of its gross revenues. In all likelihood these nominal losses represent a shift in fishing from smaller inshore vessels. While Massachusetts as a whole is predicted so suffer only a 33% loss in gross revenues, Gloucester in particular is predicted to see over a 40% gross groundfish revenue loss. In particular it appears to be the 30-50 foot vessel size class that is likely to be most adversely affected as fishing in the GOM shifts from the nearshore areas west of the Western GOM closed area to the deeper waters further east (Figure 3). Gillnetters appear to be most negatively affected gear type.

Table 6 – Summary of impacts by hail State, relative to FY2010.

	Option 1	Option 2-Low	Option 2-High
CONNECTICUT	-	-	-
MASSACHUSETTS	27%	-33%	20%
MAINE	30%	-54%	30%
NEW HAMPSHIRE	32%	-91%	29%
NEW JERSEY	-	-	-
NEW YORK	-34%	-55%	1%
RHODE ISLAND	-48%	-63%	-71%
OTHER	-	-	-

Figure 3 – Fishing locations for high (red) and low (blue) cod trips. VTR is + and Observer is <>.

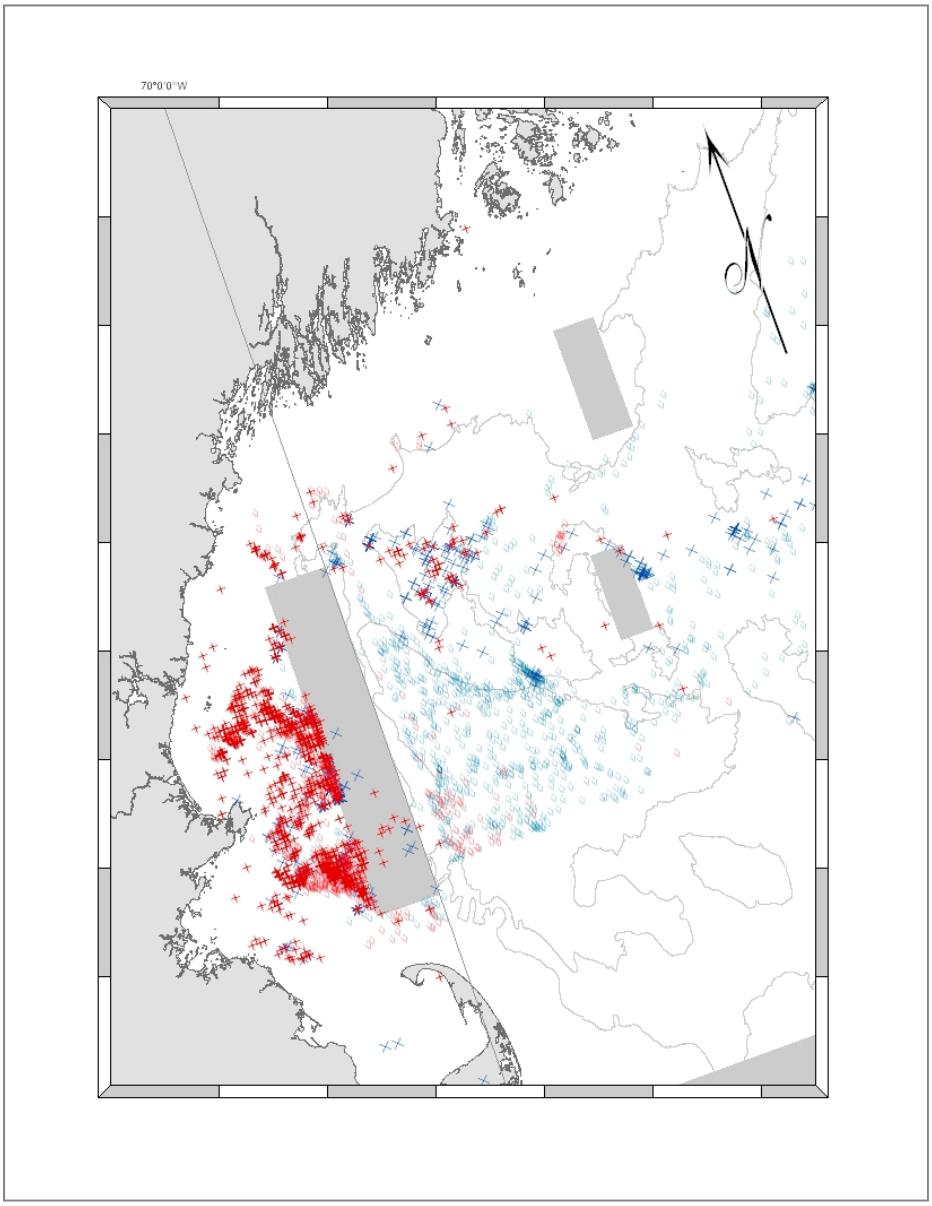


Table 7 – Predicted gross groundfish revenues and proportions by gear type.

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
Otter trawl	$72,000,240	$97,498,651	$48,870,927	$87,833,867
Gillnet	$8,161,313	$11,425,231	$2,577,757	$11,030,181
Longline	$1,817,210	$2,524,453	$1,220,758	$2,505,092
GRAND TOTAL	$81,978,763	$111,448,336	$52,669,441	$101,369,140

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
Otter trawl	87.8%	87.5%	92.8%	86.6%
Gillnet	10.0%	10.3%	4.9%	10.9%
Longline	2.2%	2.3%	2.3%	2.5%
	100.0%	100.0%	100.0%	100.0%

Table 8 – Predicted gross groundfish revenues and proportions by size class.

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
>30	$48,089	$74,808	$3,755	$69,715
30-50	$11,645,812	$17,248,859	$4,275,971	$16,636,091
50-75	$27,834,554	$37,365,622	$16,720,612	$34,155,658
>75	$42,450,307	$56,759,047	$31,669,103	$50,507,676
GRAND TOTAL	$81,978,763	$111,448,336	$52,669,441	$101,369,140

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
>30	0.1%	0.1%	0.0%	0.1%
30-50	14.2%	15.5%	8.1%	16.4%
50-75	34.0%	33.5%	31.7%	33.7%
>75	51.8%	50.9%	60.1%	49.8%
	100.0%	100.0%	100.0%	100.0%

Table 9 – Predicted gross groundfish revenues and proportions by hail State.

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
CONNECTICUT	$8,923	$8,546	$5,392	$13,255
MASSACHUSETTS	$73,951,733	$101,981,159	$49,824,769	$92,212,150
MAINE	$3,550,153	$5,099,528	$1,642,897	$5,086,295
NEW HAMPSHIRE	$1,685,361	$2,473,340	$149,597	$2,383,963
NEW JERSEY	$7,854	$5,339	$3,946	$5,448
NEW YORK	$96,561	$72,322	$43,089	$97,882
RHODE ISLAND	$2,678,150	$1,808,081	$999,740	$1,570,126
OTHER	$28	$21	$12	$20
GRAND TOTAL	$81,978,763	$111,448,336	$52,669,441	$101,369,140

	FY2010	STATUS QUO	OPTION 2 LOW	OPTION 2 HIGH
CONNECTICUT	0.0%	0.0%	0.0%	0.0%
MASSACHUSETTS	90.2%	91.5%	94.6%	91.0%
MAINE	4.3%	4.6%	3.1%	5.0%
NEW HAMPSHIRE	2.1%	2.2%	0.3%	2.4%
NEW JERSEY	0.0%	0.0%	0.0%	0.0%
NEW YORK	0.1%	0.1%	0.1%	0.1%
RHODE ISLAND	3.3%	1.6%	1.9%	1.5%
OTHER	0.0%	0.0%	0.0%	0.0%
	100.0%	100.0%	100.0%	100.0%

Table 10 – Predicted gross groundfish revenues by hail State, major Port and size class.

# runs = 100	**ACTUAL**	**MODEL**			
	FY2010	**FY2010**	**Status Quo**	**Option_2_low**	**Option_2_high**
CONNECTICUT	**$13,316**	**$8,923**	**$8,546**	**$9,011**	**$13,255**
MASSACHUSETTS	**$73,336,890**	**$73,951,733**	**$101,981,159**	**$58,536,018**	**$92,212,150**
>30		$4,110	$0	$0	$6,114
30-50		$14,838,013	$8,102,648	$7,593,161	$17,345,782
50-75		$24,703,780	$17,506,355	$15,375,585	$31,224,937
>75		$41,357,898	$37,200,704	$31,185,773	$49,730,577
Boston	*$11,598,490*	*$12,825,790*	*$11,646,591*	*$9,562,867*	*$17,771,721*
Chatham	*$2,165,564*	*$2,277,540*	*$2,418,136*	*$2,097,439*	*$3,270,683*
Gloucester	*$27,777,488*	*$23,256,440*	*$17,698,836*	*$13,974,987*	*$32,509,232*
New Bedford	*$29,072,251*	*$33,066,241*	*$25,561,087*	*$23,317,921*	*$35,111,931*
MAINE	**$4,738,143**	**$3,550,153**	**$1,949,600**	**$1,642,897**	**$5,086,295**
>30			$0		
30-50		$2,104,266	$795,290	$832,612	$3,072,312
50-75		$1,166,854	$846,881	$580,683	$1,657,666
>75		$279,033	$307,429	$229,601	$356,316
Portland	*$3,853,628*	*$2,824,570*	*$1,666,088*	*$1,385,831*	*$4,036,373*
NEW HAMPSHIRE	**$3,268,992**	**$1,685,361**	**$2,473,340**	**$160,556**	**$2,383,963**
>30			$0		
30-50		$1,618,523	$160,556	$149,587	$2,289,562
50-75		$66,839	$0	$9	$94,402
>75			$0		
NEW JERSEY	**$29,035**	**$7,854**	**$7,269**	**$3,946**	**$5,448**
NEW YORK	**$293,257**	**$96,561**	**$61,933**	**$43,089**	**$97,882**
RHODE ISLAND	**$1,611,478**	**$2,678,150**	**$1,808,081**	**$1,018,580**	**$1,570,126**
>30			$0		
30-50		$20,817	$2,105	$9,038	$15,166
50-75		$1,851,655	$683,939	$741,744	$1,146,517
>75		$804,661	$331,697	$248,544	$407,793
Point Judith	*$1,508,615*	*$2,671,392*	*$1,014,437*	*$996,910*	*$1,565,711*
OTHER	**$2,556**	**$28**	**$14**	**$12**	**$20**
GRAND TOTAL	**$83,293,667**	**$81,978,763**	**$111,448,336**	**$61,742,980**	**$101,369,140**

6.4.2.5 Accountability Measures – Additional Text

Option 2: Area-Based Accountability Measures for Atlantic Halibut, Ocean Pout, Windowpane Flounder, and Atlantic Wolffish

To estimate the economic impacts of these options we will focus on the types of fishing trips that are likely to be affected by looking at fishing practices as reported in the VTR and observer databases. We do not distinguish between Sector and common pool vessels. All revenues are reported in nominal dollars. Total and sample populations, used for estimating impacts, draw from FY2010 data only. Data used for assessing the catch rates of selective gears (separator trawl, Ruhle trawl) are from FY2010 and FY2011 to date.

The AM areas considered here are relatively small and as such it is best to use the self-reported latitude and longitude data from the VTR to construct a sample population of impacted trips. Approximately half of all trips during the timeframe of our analysis reported latitude and longitude data. For obvious reasons, it is impossible to determine if these coordinate data are biased with respect to position. Comparisons will be made to the sample population of trips with positive coordinate data, and it is important to keep in mind that this only represents half of the total population. As the location of an entire trip is coded at one particular point, these coordinate data are assumed to be approximate and to broadly represent the type and level of activities in these areas.

Table 1 – Number of trips reporting positional data, with revenues generated

	Reporting	Not reporting
number trips	13,192	8,374
total revenues	$ 113,081,991	$ 115,855,503
% total revenues	49%	51%

Windowpane flounder and ocean pout:

If adopted, this option would implement trawl gear restrictions in certain areas during either year 2 or year 3 based on ACL overages that occurred in year 1.

If this option were triggered, both common pool and sector-based vessels would have the choice of either using an approved selective gear or not fishing in the area. Two sub-options are considered, the first with smaller areas and the second with larger areas.

Sub-option 1: Smaller areas
Nearly $4 million dollars of total revenues by groundfish fishing vessels were generated from trips in these areas, representing approximately 4% of the sample population revenues. The majority of these revenues (93%) were reported on trips hailing from New Bedford, MA (Table 1).

Table 2 – Gross revenues from VTR trips reported inside Sub-option 1 (smaller areas) during FY2010

PORT	GROSS REVENUE
Boston, MA	$ 95,861
Gloucester, MA	$ 46,587
New Bedford, MA	$ 3,464,140

Nantucket, MA	$	201
Montauk, NY	$	78,405
Newport, RI	$	7,840
Pt Judith, RI	$	231,535
Grand Total	$	3,924,570

A portion of these revenues may be affected by this option, though likely not all as vessels may still elect to fish inside these areas with selective gear. Obviously selective gears have not been used extensively in these areas thus far, indicating that it is generally more profitable to fish with traditional gears than selective gears. Whether it will be more profitable to fish in other areas or to continue fishing inside these areas with selective gears depends on the profitability of other fishing options. Given the relatively small size of these areas, the additional trip costs (steaming time, etc) are likely negligible. The true cost will be the difference between the profitability of fishing inside these areas and the profitability of making those trips in the next best outside area. Note also that $4 million dollars in gross revenue from vessels hailing from New Bedford is not insignificant—it is approximately 6% of the nearly $65 million landed in that port in FY 2010.

The use of selective gear does substantially change the composition of the catch inside the windowpane and ocean pout (small) areas. Both VTR reported and observer data collected from tows inside the areas show a much higher proportion of haddock and lower proportion of flatfish relative to traditional trawl gears.

Table 3 – Proportion of kept catch on observed trips using selective (separator, Rhule) and traditional (otter) trawl gears inside the small windowpane AM option areas.

	Observer				VTR			
	selective		**traditional**		**selective**		**traditional**	
cod	$ 23,194	4.1%	$ 155,022	13.5%	$ -	0.0%	$ 296,617	7.6%
haddock	$ 510,581	91.1%	$ 656,658	57.3%	$ 36,444	100.0%	$ 1,766,087	45.4%
flats	$ 24,012	4.3%	$ 259,142	22.6%	$ -	0.0%	$ 916,976	23.6%
pollock	$ 117	0.0%	$ 9	0.0%	$ -	0.0%	$ 1,988	0.1%
white hake	$ -	0.0%	$ 6	0.0%	$ -	0.0%	$ 3,156	0.1%
skates	$ 1,688	0.3%	$ 32,881	2.9%	$ -	0.0%	$ 777,913	20.0%
other	$ 783	0.1%	$ 36,106	3.2%	$ -	0.0%	$ 119,405	3.1%
squids	$ -	0.0%	$ 5,255	0.5%	$ -	0.0%	$ 5,985	0.2%
Grand Total	$ 560,376		$ 1,145,079		$ 36,444		$ 3,888,127	

Average revenues per two for the selective gears in these areas were approximately 31% higher than per-row revenues using traditional gears on observed trips, though fewer tows were observed. Whether or not fisherman will chose to use the selective gear in these areas remains to be seen, but while this option appears to affect $4 million in revenues it appears that nearly all of that revenue can be made up for at relatively low cost by using the approved selective gears, or moving to a different fishing location.

Table 4 – Revenue per tow by two types of trawl gears from tows observed inside windowpane small areas

Trawl net		Revenue per tow	number tows
selective	$	2,536	223
traditional	$	1,918	597

Sub-option 2: Larger areas
Approximately $7 million in gross revenues is reported (VTR) to have come from these areas, with 75% of these revenues (75%) coming from New Bedford, MA. Pt Judith is the next-most affected port, with almost $750K in gross revues coming from these areas.

Table 5 - Gross revenues from VTR trips reported inside Sub-option 2 (larger areas) during FY2010.

Port		Gross revenue
Stonington, CT	$	18,948
Boston, MA	$	134,332
Gloucester, MA	$	115,316
New Bedford, MA	$	5,263,653
Nantucket, MA	$	11,998
Pt Pleasant, NJ	$	20,115
Cape May, NJ	$	5,255
Monmouth, NJ	$	6,995
Belford, NJ	$	232,377
Belmar, NH	$	2,529
Freeport, NY	$	62,847
Greenport, NY	$	9,322
Montauk, NY	$	271,857
Point Lookout, NY	$	108,771
Newport, RI	$	26,539
Pt Judith, RI	$	741,707
GRAND TOTAL	$	7,032,561

Selective gears again substantially change the composition of the catch inside the windowpane and ocean pout large areas. Both VTR reported and observer data collected from tows inside the areas show a much higher proportion of haddock and lower proportion of flatfish relative to traditional trawl gears.

Table 6 - Proportion of kept catch on observed trips using selective (separator, Rhule) and traditional (otter) trawl gears inside the large windowpane AM option areas.

	Observer				VTR			
	selective		**traditional**		**selective**		**traditional**	
cod	$ 75,181	7.4%	$ 294,954	12.5%	$ 26,656	11.8%	$ 442,460	6.5%
haddock	$ 818,668	80.6%	$ 880,722	37.3%	$ 156,242	69.0%	$ 2,233,075	32.7%
flats	$ 48,349	4.8%	$ 581,598	24.6%	$ 29,658	13.1%	$ 1,964,637	28.8%
pollock	$ 56,472	5.6%	$ 4,783	0.2%	$ 1,314	0.6%	$ 15,904	0.2%
white hake	$ 38	0.0%	$ 2,054	0.1%	$ -	0.0%	$ 27,566	0.4%
skates	$ 4,450	0.4%	$ 266,161	11.3%	$ 547	0.2%	$ 1,175,045	17.2%
other	$ 11,972	1.2%	$ 229,621	9.7%	$ 12,015	5.3%	$ 727,943	10.7%
squids	$ -	0.0%	$ 101,112	4.3%	$ -	0.0%	$ 233,545	3.4%

Grand Total	$ 1,015,131	$ 2,361,006	$ 226,432	$ 6,820,176

As with the small windowpane areas, catch rates per observed tow were about 33% higher with the selective gears than with traditional gear for observed tows in the large areas.

Table 7 - Revenue per tow by two types of trawl gears from tows observed inside windowpane large areas

Trawl net		Revenue per tow	number tows
selective	$	2,452	417
traditional	$	1,804	1309

Atlantic halibut:

If adopted, this option would (1) require the use of selective trawl gear in specified trawl halibut AM areas, (2) restrict entirely sink gillnet and longline vessel operation in specified fixed gear halibut AM areas, and (2) set a zero possession limit for all vessels.

Trawl vessel restrictions
This sub-option would require the use of selective trawl gears in the area, similar to the windowpane options discussed above. Approximately $4 million dollars in gross revues were taken from this area with trawl gears in FY 2010.

Table 8 - Gross revenues from VTR trips reported inside the Atlantic halibut trawl restriction area during FY2010

Port		Gross revenue
Boston, MA	$	146,403
Gloucester, MA	$	319,035
New Bedford, MA	$	3,299,450
Nantucket, MA	$	87,666
Barnstable, MA	$	1,138
Point Judith, RI	$	40,154
Grand Total	$	3,893,844

Selective gears again substantially change the composition of the catch inside the windowpane and ocean pout large areas. Both VTR reported and observer data collected from tows inside the areas show a much higher proportion of haddock and lower proportion of flatfish relative to traditional trawl gears.

Table 9 - Proportion of total kept catch on observed trips using selective (separator, Rhule) and traditional (otter) trawl gears inside Atlantic halibut trawl restriction area.

	Observer				VTR			
	selective		**traditional**		**selective**		**traditional**	
cod	$ 35,711	13.8%	$ 364,444	17.5%	$ 9,733	23.1%	$ 521,323	13.5%
haddock	$ 129,036	50.0%	$ 784,196	37.6%	$ 25,387	60.3%	$ 1,245,429	32.3%
flats	$ 11,895	4.6%	$ 272,928	13.1%	$ 2,596	6.2%	$ 717,946	18.6%
pollock	$ 50,824	19.7%	$ 116,162	5.6%	$ 2,683	6.4%	$ 136,223	3.5%
white hake	$ 40	0.0%	$ 513	0.0%	$ -	0.0%	$ 421	0.0%
skates	$ 2,306	0.9%	$ 25,317	1.2%	$ -	0.0%	$ 719,744	18.7%

other	$	28,224	10.9%	$	520,649	25.0%	$	1,655	3.9%	$	510,683	13.3%
quids	$	-	0.0%	$	85	0.0%	$	21	0.0%	$	-	0.0%
Grand Total	$	258,036		$	2,084,294		$	42,075		$	3,851,769	

As with the small windowpane areas, catch rates per observed tow were about 15% higher with the selective gears than with traditional gear for observed tows in the large areas

Table 10 - Revenue per tow by two types of trawl gears from tows observed inside Atlantic halibut trawl restriction area.

Trawl net		Revenue per tow	number tows
selective	$	1,518	172
traditional	$	1,353	1541

Fixed gear vessel restrictions
This option would prohibit fishing with fixed gears. In this case, all of the fishing activities affected by these areas would be displaced, and the costs would be those associated with lower catch rates and/or longer steaming time. Approximately $381K in revenues came from trips reported fishing inside this area, with Chatham contributing the highest proportion. The bulk of these came from cod.

Table 11 - Gross revenues from VTR trips reported inside the Atlantic halibut fixed gear restriction areas during FY2010.

Port		Gross revenue
Portland, ME	$	21,384
Harpswell, ME	$	23,275
Gloucester, MA	$	98,613
Chatham, MA	$	231,429
Portsmouth, NH	$	5,146
Seabrook, NH	$	1,376
Grand Total	$	381,913

Table 12 - Proportion of total kept catch by species on observed trips inside Atlantic halibut fixed gear restriction areas.

		Observer		VTR
cod	$	16,677	$	194,729
haddock	$	4,812	$	27,282
flats	$	346	$	12,622
pollock	$	2,668	$	56,599
white hake	$	5	$	99
skates	$	765	$	7,405
other	$	4,527	$	83,177
quids	$	-	$	-
Grand Total	$	29,798	$	381,913

Wolffish:
If adopted, this option would (1) require the use of selective trawl gear in specified trawl wolffish AM areas, and (2) restrict entirely sink gillnet and longline vessel operation in specified fixed gear wolffish AM areas.

Trawl vessels
A little over $2 million dollars in gross revenues were reported to have been caught inside the proposed trawl restriction area for wolffish. The vast majority of these, 85%, came from Gloucester, MA. Like the previously discussed trawl gear restriction areas, this would require the use of selective gear or, alternatively, fishing elsewhere.

Table 13 - Gross revenues from VTR trips reported inside the wolffish trawl gear restriction areas during FY2010.

Port	Gross revenue
Boston, MA	$ 56,544
Gloucester, MA	$ 1,854,027
Marshfield, MA	$ 10,410
New Bedford, MA	$ 31,748
Plymouth, MA	$ 97,192
Provincetown, MA	$ 672
Rockport, MA	$ 51,792
Portsmouth, NH	$ 10,690
Seabrook, NH	$ 10,198
Grand Total	$ 2,123,274

Selective gears were hardly utilized in this area, with just one reported observed tow and no trips reported in the VTR.

Table 14 - Proportion of total kept catch on observed trips using selective (separator, Rhule) and traditional (otter) trawl gears inside wolffish trawl restriction area.

	Observer		VTR	
	selective	traditional	selective	traditional
cod	$ 3,587	$ 432,268		$ 1,593,903
haddock	$ 205	$ 7,798		$ 22,630
flats	$ -	$ 145,404		$ 437,352
pollock	$ 82	$ 16,149		$ 27,218
white hake	$ -	$ 6		$ 5
skates	$ -	$ 9,187		$ 11,481
other	$ -	$ 14,313		$ 30,549
quids	$ -	$ 6		$ 136
Grand Total	$ 3,874	$ 625,130	$ -	$ 2,123,274

Table 15 - Revenue per tow by two types of trawl gears from tows observed inside Atlantic halibut trawl restriction area.

Trawl net	Revenue per tow	number tows
selective	$ 3,874	1
traditional	$ 1,823	345

Fixed gear vessels
Fixed gear vessels fishing out of Chatham reported revenues of approximately $325K in FY 2010. These trips would have to occur elsewhere, and while costs may go up slightly these revenues would be made up by fishing in other areas.

Table 16 - Gross revenues from VTR trips reported inside the wolffish fixed gear restriction areas during FY2010.

Port	Gross revenue	
Chatham, MA	$	324,224
Grand Total	$	324,224

Table 17 - Proportion of total kept catch by species on observed trips inside wolffish fixed gear restriction areas.

	Observer		VTR
cod	$ 15,171	$	187,164
haddock	$ 544	$	10,357
flats	$ 215	$	631
pollock	$ 1,406	$	29,581
white hake	$ 0	$	-
skates	$ 10,011	$	48,565
other	$ 4,468	$	47,925
quids	$ -	$	-
Grand Total	$ 31,816	$	324,224