7.0 Environmental Consequences – Analysis of Impacts

7.4 Economic Impacts

7.4.1 Introduction

Consideration of the economic impacts of the changes made in this framework is required pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976. NEPA requires that before any agency of the federal government may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that includes the integrated use of the social sciences (NEPA Section 102(2)(C)). The Magnuson-Stevens Act stipulates that the social and economic impacts to all fishery stakeholders should be analyzed for each proposed fishery management measure in order to provide advice to the Council when making regulatory decisions (Magnuson-Stevens Section 1010627, 109-47).

The National Marine Fisheries Service (NMFS) provides a series of guidelines to be used when performing economic reviews of regulatory actions. The key dimensions for this analysis are expected changes in net benefits to fishery stakeholders, the distribution of benefits and costs within the industry, and changes in income and employment (NMFS 2007). Where possible, cumulative effects of regulation will be identified and discussed. Other social concerns are discussed in Section 7.5. The economic impacts presented here consist of both qualitative and quantitative analyses dependent on available data, resources, and the measurability of predicted outcomes. In general, the regulations proposed in Framework 51 will impact revenue through changes to ACLs and fishery measures and may, for particular fisheries, impact operating costs through the modification of accountability measures and monitoring requirements. It is assumed throughout this analysis that changes in revenues will have downstream impacts on income levels and employment, however, these are only mentioned if directly quantifiable.

7.4.1 Updates to Status Determination Criteria, Formal Rebuilding Programs and Annual Catch Limits

7.4.1.1 GOM Cod Rebuilding Strategy

7.4.1.1.1 Option 1: No Action

The current rebuilding strategy for Gulf of Maine (GOM) cod, adopted in Amendment 13, uses a fishing mortality target that is calculated to rebuild the stock by 2014 with a 50 percent (median) probability of success. The stock is unlikely to rebuild by that date in the absence of all fishing mortality and in 2012, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the Magnuson-Stevens Act requires that a revised rebuilding program be implemented within 2 years for GOM cod. This No Action alternative would not address the Magnuson-Stevens Act requirement. If this option is adopted, fishing mortality (set at 75% F_{MSY}) as implemented in FW 50 would be maintained in 2014. However, because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015.

This option could result in no change in net economic impacts for 2014, but the resulting quota reductions for 2015 could cause severe disruptions to the groundfish fishery in the GOM stock area. Cod is a primary component of the multispecies catch in this region, and a quota set at or near levels consistent with "incidental bycatch" would impede the harvest of every groundfish stock. Commercial catches in the GOM would fall to trivial levels, resulting in a reduction of revenues that likely would approach 100% of those observed in FY2014. However, a zero-possession restriction could be imposed on cod in the GOM, thereby allowing fisherman to target other stocks while discarding cod. Such a restriction is unlikely to meet MSA requirements, but would dramatically decrease the economic costs associated with this Option.

Recreational fisheries would also experience significant economic losses, though these fisheries are perhaps better able to target stocks other than cod in the GOM. Economic losses for recreational fisheries may instead approach 50-80% reductions from FY2014 levels.

7.4.1.1.2 Option 2: Revised Rebuilding Strategy

Two options are being considered for a revised rebuilding strategy for GOM cod. Both rebuilding options assume no changes to the FY 2014-2015 ABC (1,550 mt) that was previously recommended by the SSC, and adopted by FW 50.

<u>Sub-Option A</u>: This strategy would rebuild the stock in 8 years, with a 50 percent (median) probability of success by 2022. This strategy is developed to be more conservative compared to sub-Option B. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}).

<u>Sub-Option B</u>: This strategy would rebuild the stock in 10 years, with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}).

In 2014, there is no difference in economic impacts between either Sub-Option and the No Action option. Both Sub-Options result in significantly greater economic benefits than the No Action option for 2015 and beyond, because they appear to maintain fishing mortality targets at (or above) 75% of F_{msy}. Relative to Sub-Option B, Sub-Option A may be more likely to require reversion to an $F_{rebuild}$ below 75%$_{Fmsy}$ and potentially lower ACLs in years 2016 and beyond.

Subsequent Framework Actions will modify ACLs in accordance with the (Sub-) Option selected, and these actions will provide a more precise estimate of the economic impacts of ACLs on commercial and recreational fisheries.

If it were assumed, however, that improved targeting technology amongst other factors were to allow the fishing industry to capture 100% of the allocated quota for GOM cod, and if it were further assumed that the quotas as projected remain in place for the duration of the rebuilding time frame, it would be possible to compare the net present value, in 2013 dollars, of the two Sub-Options and the No Action Option. This comparison is complicated by the presence of two competing models of the GOM cod stock, either of which may be used in quota setting, and therefore two scenarios emerge for each Sub-Option, referred to here as the Base Case and M-Ramp models.

Comparison of alternative benefit streams over time requires discounting future benefits to convert all benefit streams to a present value. For this purpose, a discount rate of 3% was selected as recommended by NOAA to reflect the social rate of time preference (NOAA 1999). The Executive Branch Office of Management and Budget recommends a discount rate of 7% to estimate the rate of return on average investments. Both rates are included here for the sake of comparison. Net present values (NPVs) are calculated through 2024, the approximate terminal rebuilding date for this stock.

The NPV analysis translates the potential landing streams into future revenues, discounted as appropriate, by applying an average price to potential GOM cod landings. As previously stated, this analysis assumes implicitly that all allocated fish are caught, and it also assumes that a 10% discard rate is applied in all years to estimate landings.

NPVs are of GOM cod landings alone and do not take into account potential revenue losses or gains from the sale of other stocks of groundfish. A simple linear regression was used to calculate an average price based on price and quantity relationships for GOM cod from 1996 – 2011 (Figure 1). The resulting prices were then applied to anticipated ACLs under the various scenarios (Table 1).

The results indicate (given the assumptions of full utilization of ACLs and perfect realization of predicted ACLs through 2024) under the Base Case model, a 10 year rebuilding plan(Sub-Option B) would maximize net present value relative to Sub-Option A (Table 1). Under the M-Ramp model there is little discernable difference between the two Sub-Options. Either Sub-Option is preferable to the No Action option, as the No Action yields very little economic benefits.

Figure 1 – Price and quantity relationship for GOM cod (data: 1996-2011 CFDERS, prices in 2013 dollars)

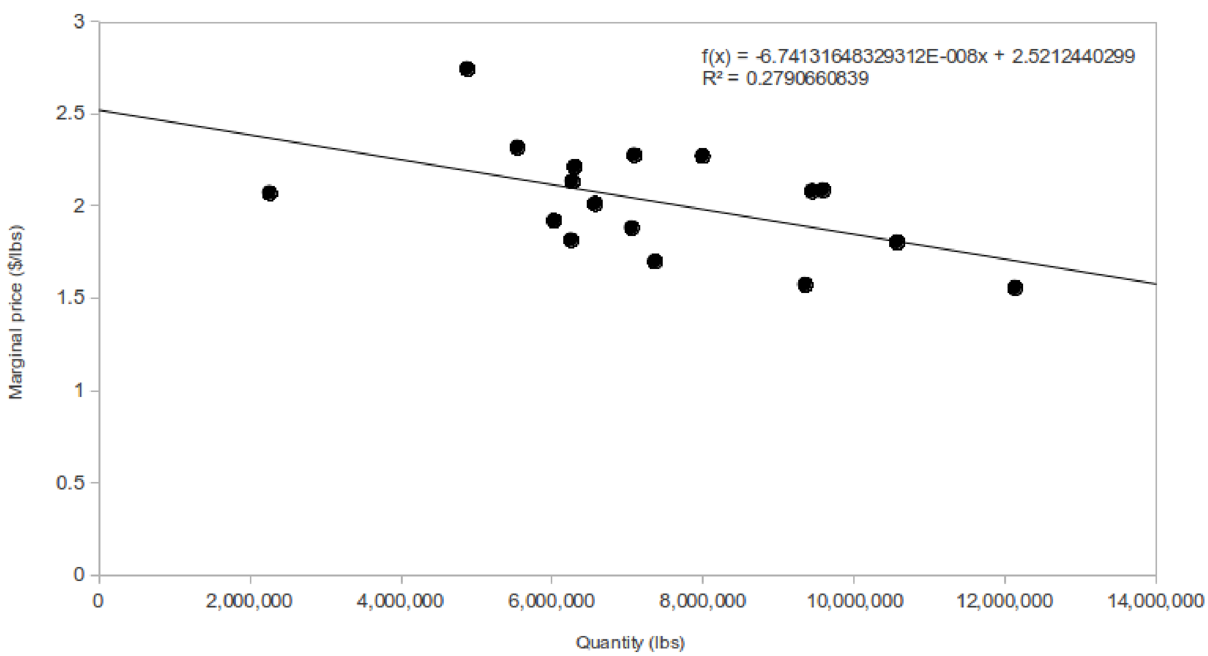

Table 1 – Net present value estimates for revenues from GOM cod landings based on two different models, three Options and three discount rates (millions of dollars)

	discount rate	8-year	10-year	No Action
BASE CASE	3%	$159	$167	$7
	7%	$124	$130	$7
	10%	$104	$109	$6

	discount rate	8-year	10-year	No Action
MRAMP	3%	$172	$171	$7
	7%	$135	$135	$7
	10%	$114	$115	$6

7.4.1.1.3 Option 3: Rebuilding Plan Review Analysis for GOM Cod

This Option specifies an administrative procedure for reviewing the revised GOM cod rebuilding plan in the future. It has no direct or indirect economic impacts.

7.4.1.2 American Plaice Rebuilding Strategy

7.4.1.2.1 Option 1: No Action

The current rebuilding strategy for American plaice, adopted in Amendment 13, uses a fishing mortality target that is calculated to rebuild the stock by 2014 with a 50 percent probability of success. The stock is unlikely to rebuild by that date in the absence of all fishing mortality, and in 2012, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the Magnuson-Stevens Act requires that a revised rebuilding program be implemented within 2 years for American plaice. This No Action alternative would not address this Magnuson-Stevens Act requirement. If this option is adopted fishing mortality (set at 75% F_{MSY}) as implemented in FW 50 would be maintained in 2014. However because the stock is not projected to be rebuilt by 2014, fishing mortality would be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2015.

This option would result in no change in net economic impacts for 2014, but the anticipated quota reductions for 2015 would result in severe disruptions to the groundfish fishery across all stock areas. American plaice is sometimes referred to as a “unit stock” species, meaning that it does not have multiple stocks within the management unit. As such, a low or *de minimis* allocation will result in loss of groundfish fishing opportunities coast-wide. The FY2012 value of groundfish catch was approximately $69 million in 2012 dollars. FY14 revenues would be consistent with ACLs specified elsewhere in this document, and would be unaffected by this option, but FY15 groundfish revenues would likely approach zero without other future changes to the management regulations, such as a zero possession restriction imposed on the fishery.

Recreational fisheries would be unaffected by this option, as there is no directed recreational fishery, and no recreational sub-allocation, for American plaice.

7.4.1.2.1 Option 2: Revised Rebuilding Strategy

Three options are being considered for a revised rebuilding strategy for American plaice. All three rebuilding options assume no changes to the FY 2014-2015 ABCs that were previously recommended by the SSC, and adopted by FW 50.

<u>Sub-Option A</u>: The rebuilding strategy would be to rebuild the stock in 7 years with a 50 percent (median) probability of success by 2021. This strategy is the most conservative compared to sub-Options B and C. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}).

<u>Sub-Option B</u>: The rebuilding strategy would be to rebuild the stock in 8 years with a 50 percent (median) probability of success by 2022. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}).

<u>Sub-Option C</u>: The rebuilding strategy would be to rebuild the stock in 10 years with a 50 percent (median) probability of success by 2024. This strategy is based on a fishing mortality that is above 75%F_{MSY}; $F_{rebuild}$ is not allowed to be initially limiting (i.e., $F_{rebuild}$ is greater than 75% F_{MSY}).

In 2014, there is no difference in economic impacts between the three Sub-Options and the No Action option. The Sub-Options result in significantly greater economic benefits than the No Action option for 2015 and beyond, because they appear to maintain fishing mortality targets at (or above) 75% of F_{msy}. In general, the longer the rebuilding program, the greater the economic benefits. This result is consistently observed across all discount rates greater than approximately 1%.

Subsequent framework adjustment actions will modify ACLs in accordance with the (Sub-) Option selected, and these actions will provide a more precise estimate the economic impacts of ACLs on commercial and recreational fisheries.

If it were assumed, however, that improved targeting technology amongst other factors were to allow the fishing industry to capture 100% of the allocated quota for American plaice, and if it were further assumed that the quotas as projected remained in place for the duration of the rebuilding time frame, it would be possible to compare the net present value, in 2013 dollars, of the three Sub-Options and the No Action Option.

Comparison of alternative benefit streams over time requires discounting future benefits to convert all benefit streams to a present value. For this purpose, a discount rate of 3% was selected as recommended by NOAA to reflect the social rate of time preference (NOAA 1999). The Executive Branch Office of Management and Budget recommends a discount rate of 7% to estimate the rate of return on average investments. Both rates are included here for the sake of comparison. NPVs are calculated through 2024, the approximate terminal rebuilding date for this stock.

The NPV analysis translates the potential landing streams into future revenues, discounted as appropriate, by applying an average price to potential American plaice landings. Implicitly, again, this analysis assumes that all allocated fish are caught and a 10% discard rate is applied in all years to estimate landings. NPVs are of American plaice landings alone and do not take into account potential revenue losses or gains from the sale of other stocks of groundfish.

A simple linear regression was used to calculate an average price based on price and quantity relationships for American plaice from 1996 – 2011 American plaice demonstrates a demand function where price is inelastic with respect to quantity (i.e., demands changes little due to price) (Figure 2). As such, a constant average price is applied to all landings and this price is applied to the anticipated ACLs under the various scenarios (Table 2).

The results indicate that, given the assumptions of full utilization of ACLs and perfect realization of predicted ACLs through 2024, there is little discernable difference between the three Sub-Options. The sub-Options are generally preferable to the No Action option, since the No Action option yields very little economic benefits.

Figure 2 - Price and quantity relationship for American plaice (data: 1996-2011 CFDERS, prices in 2013 dollars)

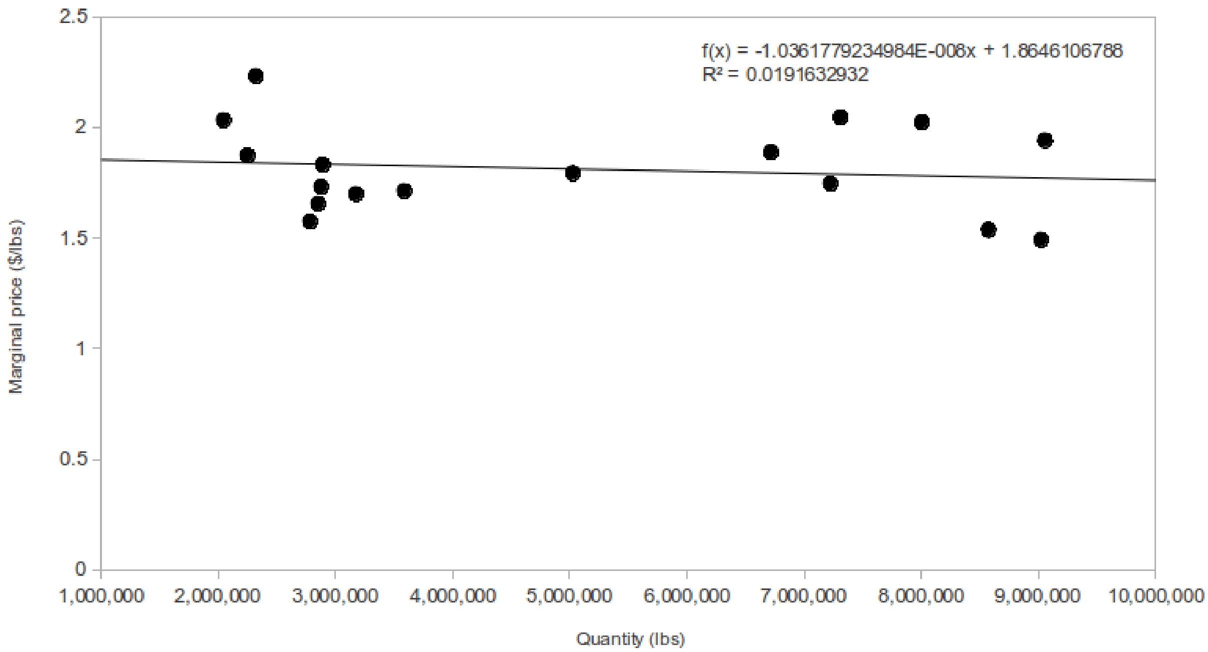

Table 2 - Net present value estimates for revenues from American plaice landings based on four Options and three discount rates (millions of dollars)

discount rate	7-year	8-year	10-year	No Action
3%	$74	$78	$80	$5
7%	$59	$61	$63	$5
10%	$50	$52	$54	$5

7.4.1.3 Annual Catch Limit Specifications

The following analysis focus on vessels enrolled in the sector allocation system, which constitute nearly 99% of the landings of the commercial groundfish fishery.

7.4.1.3.1 Option 1: No Action

By selecting Option 1, ACLs will be based on FW50 specifications for the years 2013-2014, which have missing values for many species (Table 3). Specifically, GB East cod and haddock, GB yellowtail flounder, and white hake would have no ACLs set and fishing would not be permitted for these species, nor would fishing be allowed in these species' broad stock areas. The portion of the GB East cod and haddock ACLs that would ordinarily be allocated to the eastern GB area would instead be allocated the western GB stock area and consequently the ACLs for GB West cod and haddock are higher under the No Action option than under Option 2.

Table 3 – No Action Option Groundfish Sector sub-ACLs (lbs)

SPECIES	STOCK	Sector sub-ACL
American plaice		2,996,079
Cod	GB East	0
	GB West	3,913,201
	GOM	1,794,561
Haddock	GB East	0
	GB West	70,089,279
	GOM	480,607
Halibut		-
Ocean pout		-
Pollock		28,964,298
Redfish		23,197,012
White hake		0
Windowpane	North	-
	South	-
Winter flounder	GB	7,420,751
	GOM	1,521,849
	SNE/MA	2,134,072
Witch flounder		1,324,977
Wolffish		-
Yellowtail flounder	CC/GOM	1,029,558
	GB	0
	SNE	992,079

Economic impacts on the Sector-based commercial fishery

As the white hake stock area encompasses the geographic range of the management unit, the adoption of the No Action option would almost certainly lead to a complete shut-down of the groundfish fishery, bringing fishery-wide commercial groundfish revenues to zero.

Economic impacts on the Common Pool fishery

Similarly, the Common Pool would not have an allocation of white hake and vessels fishing in the common pool would likely be prohibited from participating in the groundfish fishery.

Economic impacts on the recreational groundfish fishery

Impacts on the recreational fishery are less certain. There is no recreational fishery in the eastern GB stock area, and no recreational sub-allocation for GB yellowtail or white hake. It seems likely that the recreational fishery would not be significantly impacted by the adoption of the No Action alternative. Sub-allocations for other recreational stocks (GOM cod, haddock) are similar to those from FY13 and no measures are proposed in this framework action that would alter the administration of this fishery.

Economic impacts on the scallop fishery

The precise impacts of the No Action option on the scallop fishery are unclear. This option does not identify scallop fishery sub-ACLs for GB yellowtail flounder. While this would not prevent the scallop fishery from fishing in FY 2014, it is not clear if the absence of a sub-ACL would be treated as if the sub-ACL was zero. If this would be the case, then any catches of these stocks would lead to scallop fishery AMs being triggered in FY 2015 and/or later years. As a result, this option would result in large reductions in scallop fishery revenues when compared to Option 2. But if this is not the case and the scallop fishery catches of these stocks do not trigger AMs, then this option might allow for greater scallop fishery revenues than would be the case if AMs are triggered using the ACLs of Option 2.

7.4.1.3.2 Option 2: Revised Annual Catch Limit Specifications

Economic impacts on the Sector-based commercial fishery

As in past framework adjustment actions, the Quota Change Model (QCM) is used to predict the potential impact of changes in quota on the Sector-based commercial fishery. The QCM is a simulation model that selects trips from existing catch records that are representative of those trips most likely to take place under the new quota conditions. A pool of 100,000 actual trips is selected based on each trip's utilization of allocated ACE, using fishery-dependent trip-level data from FY12. The more efficiently a trip used its ACE, the more likely that trip is to be drawn into the pool, and, potentially, the more times that trip will be replicated within the pool. ACE efficiency is determined by the ratio of ACE expended to net revenues on a trip for each of the 16 allocated stocks. Net revenues are calculated as gross revenues minus trip costs minus quota leasing costs, where trip costs are based on observer data and quota leasing costs are estimated from an inter-sector lease value model based on FY 2012 (Murphy et al. 2012). Trips that were particularly ACE-inefficient are not drawn into the pool at all. The model pulls trips from the pool at random, summing the ACE expended for the 16 allocated stocks as trips are drawn. When one stock's ACE reaches the allocated limit, no trips from that broad stock area are selected and the model continues selecting trips until quota limits are achieved in all three broad stock areas or for one of the unit stocks.

By running simulations based on actual trips, the model implicitly assumes that stock conditions existing during the data period are representative, that trips are repeatable, and that price/quantity relationships realized during the data period are applicable to the forecast period (FY14). Use of existing trip net revenues requires an assumption of constant trip costs and constant quota costs. These assumptions will surely not hold—fisherman will continue to develop their technology and fishing practices to increase their efficiency, market conditions will induce additional behavior changes, and fishery stock conditions are highly dynamic. Fuel and other costs may change due to larger economic shifts or shoreside industry consolidation. Quota lease prices will certainly increase under more restrictive allocations, though it is impossible to estimate the magnitude of these increases.

In general, the model will under-predict true landings and/or revenues if stock conditions improve, if prices rise in response to lower quantities landed, or if fisherman become more efficient at maximizing the value of their ACE. Conversely, the model will over-predict true landings and/or revenues if stock conditions decline, markets deteriorate or fishing costs increase. The model will over-predict landings if stock conditions for a highly constraining stocks are such that catchability increases substantially and/or fisherman are unable to avoid the stock--in this circumstance, better than expected stock conditions may lead to worse than anticipated fishery performance.

Groundfish Sector sub-ACLs (mt) for 2010-2013 and Option 2 for 2014 ACLs are summarized in Table 4. Output from the simulation model is provided in Table 5.

Under Option 2, gross groundfish revenues for FY14 are predicted to be just over $58 million and all gross revenues on groundfish trips are predicted to be just under $71 million (Table 8). This represents approximately a 26% reduction in gross revenues relative to FY12 and an 18% reduction in revenues relative to those predicted in FY13 (Table 8). On a home-port state level, New Hampshire is expected to have the largest percentage decline (32%) in gross revenues from groundfish relative to FY12. Rhode Island is expected to be the least affected by these ACLs, with a small 7% predicted increase in gross groundfish revenues relative to FY12. For major home-ports, Gloucester, MA is expected to have the largest percentage decline (33%) in gross revenue and New Bedford, MA is expected to be the least affected with a 5% decline in gross groundfish revenues predicted (Table 6).

The impacts to gross revenues are expected to be distributed non-uniformly across different vessel length categories as well, with the 30-50 foot category experiencing the largest drop in gross revenue compared to FY12, with a predicted 35% reduction (Table 7)Larger vessel classes are predicted to experience smaller declines in gross revenues, with the largest vessel size class (75+ ft) predicted to see a 10% decline in gross revenues. This result is not surprising, as small vessels have less scalability in terms of landings and have a smaller geographic range. Net revenues, as opposed to gross revenues, are expected to decline much less substantially as lower allocations drive fisherman to fish as efficiently as possible (Table 8). The relatively large decline in predicted trip costs (fuel, ice, food, etc) reflects an anticipated actual reduction, but most likely over-estimates the efficiency gains that will be possible in FY14. Predicted trip costs for FY13 are substantially lower than those predicted for FY14 despite a similar number of trips, days absent, etc. This is in part a function of the optimization component of the QCM, which selects the most profitable trips (often the lowest-cost trips) disproportionately, but may also be signaling a trend in rising trip costs.

FY14 is predicted to see a 20% decline in net revenues relative to FY12 and a 12% decline relative to predicted net revenues for FY13. Crew-days, days absent and total Sector trips are all predicted to decline substantially relative to FY 2012, as the model predicts only the most efficient trips will occur under continued restrictive quota allocations (Table 8). This represents fewer earning opportunities for crew members, and may signal reductions in incomes for down-stream fishing businesses such as fish dealers, ice houses, gear shops, and shipyards.

Table 4 – Groundfish Sector sub-ACLs (mt) for 2010-2013 and Option 2 for 2014

SPECIES	STOCK	2010	2011	2012	2013	Option 2, 2014
American plaice		2,748	3,108	3,223	1,420	1,359
	GB East	325	423	445	92	145
Cod	GB West	2,977	3,878	4,079	1,715	1,584
	GOM	4,327	4,825	3,619	830	814
	GB East	11,913	9,065	8,111	3,754	9,971
Haddock	GB West	28,273	21,515	19,252	22,442	18,666
	GOM	799	778	648	187	218
Halibut		-	-	-		-
Ocean pout		-	-	-		-
Pollock		16,178	13,952	12,530	12,893	13,138
Redfish		6,756	7,541	8,291	10,132	10,522
White hake		2,505	2,974	3,257	3,849	4,308
Windowpane	North	-	-	-		-
	South	-	-	-		-
	GB	1,823	2,007	3,367	3,528	3,364
Winter flounder	GOM	133	329	690	714	690
	SNE		-		1,210	968
Witch flounder		827	1,236	1,426	610	601
Wolffish		-	-		-	-
	CC/GOM	729	940	1,021	479	467
Yellowtail flounder	GB	803	1,142	364	116	252
	SNE/MA	235	524	607	570	450

Table 5 – Predicted Option 2 catch (lbs) and gross revenue by stock from simulation model (*500 realizations*)

		limit	catch	utilization	ex_vsl_value
am_plaice	**all**	2,996,079	2,629,857	88%	$3,903,973
cod	**gb_east**	319,670	146,707	46%	$162,253
cod	**gb_west**	3,492,118	3,363,083	96%	$6,820,426
cod	**gom**	1,794,561	1,769,437	99%	$4,280,519
haddock	**gb_east**	21,982,266	804,401	4%	$1,219,368
haddock	**gb_west**	41,151,437	1,747,944	4%	$2,793,642
haddock	**gom**	480,607	367,450	76%	$780,661
halibut	**all**	0	96,646	.	$146,703
non_gfish	**all**	0	21,827,479	.	$15,437,992
ocean_pout	**all**	0	76,571	.	$0
pollock	**all**	28,964,298	11,869,407	41%	$10,856,342
redfish	**all**	23,197,012	7,414,715	32%	$3,727,931
wh_hake	**all**	9,497,503	4,259,018	45%	$5,698,826
windowpane	**north**	0	228,891	.	$1
windowpane	**south**	0	232,426	.	$0
winter_fl	**gb**	7,416,342	4,477,145	60%	$9,061,821
winter_fl	**gom**	1,521,849	258,900	17%	$539,169
winter_fl	**sne_ma**	2,134,072	210,003	10%	$2,490
witch_fl	**all**	1,324,977	1,301,836	98%	$2,467,637
wolffish	**all**	0	44,458	.	.
yt_flounder	**cc_gom**	1,029,558	745,874	72%	$1,029,291
yt_flounder	**gb**	554,462	368,615	66%	$574,568
yt_flounder	**sne**	992,079	991,296	100%	$1,506,325
	TOTAL		**65,232,160**		**$71,009,940**
	TOTAL GROUNDFISH	**148,848,888**	**43,404,682**	**29%**	**$58,653,156**

Table 6 – Predicted groundfish catch and gross revenue by homeport state and port under Option 2 from simulation model

	FY 2010	FY 2011	FY 2012	FY 2013 (predicted)	FY 2014 (predicted)	% change from FY_12		
	Ex-vessel value	Ex-vessel value	Ex-vessel value	*Catch (lbs)*	Ex-vessel value	*Catch (lbs)*	Ex-vessel value	
Connecticut	$ 35,081	$ 46,646	$ 12,778	*14,031*	$ 16,284	*18,387*	$ 14,766	16%
Massachusetts	$ 58,006,800	$ 64,605,304	$ 47,530,895	*29,945,047*	$ 38,255,313	*28,582,837*	$ 38,143,540	-20%
Boston	$ 14,251,495	$ 17,458,607	$ 13,203,964	*8,730,169*	$ 11,142,660	*8,429,184*	$ 10,925,097	-17%
Chatham	$ 2,482,876	$ 2,582,201	$ 957,320	*557,276*	$ 857,939	*503,753*	$ 833,477	-13%
Gloucester	$ 16,224,983	$ 16,807,126	$ 12,110,282	*9,068,082*	$ 9,962,835	*7,006,414*	$ 8,067,363	-33%
New Bedford	$ 18,149,740	$ 20,387,478	$ 16,213,206	*9,552,957*	$ 13,516,564	*10,852,708*	$ 15,482,606	-5%
Maine	$ 14,470,489	$ 14,599,316	$ 13,498,376	*12,820,916*	$ 12,683,212	*10,590,255*	$ 11,413,905	-15%
Portland	$ 10,269,562	$ 9,683,130	$ 8,841,043	*9,677,859*	$ 8,823,335	*7,795,446*	$ 7,627,913	-14%
New Hampshire	$ 3,347,576	$ 4,673,318	$ 3,110,230	*1,962,643*	$ 2,317,117	*1,576,817*	$ 2,107,929	-32%
New Jersey	$ 97,897	$ 66,667	$ 208,687	*1,424*	$ 1,315	*94,599*	$ 150,478	-28%
New York	$ 909,309	$ 1,262,452	$ 665,866	*352,138*	$ 581,975	*444,907*	$ 739,782	11%
Rhode Island	$ 3,123,923	$ 3,144,732	$ 2,536,242	*1,449,554*	$ 1,838,143	*1,957,761*	$ 2,723,910	7%
Point Judith	$ 2,412,589	$ 2,284,227	$ 1,848,403	*1,198,607*	$ 1,444,257	*1,509,505*	$ 2,043,208	11%
Other Northeast	$ 511,277	$ 365,959	$ 124,222	*69,987*	$ 119,577	*107,239*	$ 174,472	40%
TOTAL	$ 80,502,352	$ 88,764,394	$ 67,687,297	*46,615,739*	$ 55,812,937	*43,372,802*	$ 55,468,783	-18%

Table 7 – Predicted groundfish catch and gross revenue by vessel length class under Option 2 from simulation model

Length class	FY 2010	FY 2011	FY 2012	FY 2013 (predicted)	FY 2014 (predicted)
<30'	$ 16,485,506	$ 496,779	$ 527,746	$ 19,114	$ 447,791
30'to<50'	$ 24,689,727	$ 18,835,175	$ 13,457,745	$ 10,001,904	$ 8,671,624
50'to<75'	$ 39,225,644	$ 28,294,806	$ 22,332,585	$ 17,559,012	$ 18,105,071
75'+	$ 107,682	$ 41,142,431	$ 31,369,221	$ 28,232,906	$ 28,244,296
TOTAL	**$ 80,508,559**	**$ 88,769,191**	**$ 67,687,297**	**$ 55,812,937**	**$ 55,468,783**

Table 8 – Predicted outcomes under Option 2 based on 500 model realizations ($ millions)

		Gross revenue	Gross groundfish revenue	Net revenue	Total variable cost	Trip cost	Quota cost	Sector landing fees	Crew days	Days Absent	Number trips
	FY 2010	$ 95.8	$ 80.5	$ 53.3	$ 45.0	$ 20.7	$ 21.8	$ 2.5	55,992	18,401	13,474
	FY 2011	$ 109.8	$ 88.8	$ 53.5	$ 59.3	$ 29.2	$ 27.5	$ 2.7	65,450	21,465	15,958
	FY 2012	$ 95.4	$ 67.7	$ 46.2	$ 49.2	$ 30.3	$ 17.0	$ 2.0	65,669	19,556	14,487
	FY 2013 (predicted)	*$ 74.1*	*$ 55.8*	*$ 41.8*	*$ 32.3*	*$ 16.6*	*$ 13.8*	*$ 1.7*	*47,583*	*13,472*	*6,797*
FY 2014 (predicted)	*MIN*	*$ 64.7*	*$ 50.5*	*$ 33.7*	*$ 32.0*	*$ 19.6*	*$ 10.9*	*$ 1.4*	*20,918*	*6,892*	*6,091*
	MAX	*$ 75.9*	*$ 59.2*	*$ 38.8*	*$ 38.3*	*$ 23.6*	*$ 13.0*	*$ 1.7*	*50,595*	*14,149*	*6,949*
	MEAN	*$ 70.9*	*$ 55.5*	*$ 36.7*	*$ 35.2*	*$ 21.6*	*$ 12.0*	*$ 1.6*	*46,735*	*13,162*	*6,602*
	STD	*$ 1.9*	*$ 1.6*	*$ 0.9*	*$ 0.7*	*$ 1.1*	*$ 0.4*	*$ 0.0*	*2,140*	*533*	*140*
	% change FY12	-26%	-18%	-21%	-29%	-28%	-29%	-20%	-29%	-33%	-54%
	% change FY13(p)	-4%	-1%	-12%	9%	30%	-13%	-8%	-2%	-2%	-3%

Economic impacts on the Common Pool fishery

As with sectors, Option 2 could result in declines in catch for the common pool fishery, which would have negative economic impacts for this component of the fishery.

Economic impacts on the recreational groundfish fishery

Recreational fishermen target GOM haddock, GOM cod, pollock, and GOM winter flounder, with GOM cod and GOM haddock a particularly important part of the catch (see Amendment 16 for a description of the recreational fishery in the GOM). As shown in Section **Error! Reference source not found.**, there have been recent declines in recreational groundfish fishing activity. These declines are likely to continue given the low allocations for GOM cod and GOM haddock for FY 2014.

Option 2 could directly affect recreational anglers and have an indirect impact on charter/party operators through a potential change in passenger demand for charter/party fishing trips. However, the exact measures that will be in place are likely to be carried over from FY 2013. There is likely to be no difference in economic impacts between Option 1 and Option 2.

Economic impacts on the scallop fishery

To be provided.

7.4.2 Commercial and Recreational Fishery Measures

7.4.2.1 Small Mesh Fishery Accountability Measures

7.4.2.1.1 Option 1: No Action

This option would not establish additional accountability measures (AMs) for the small-mesh fishery for Georges Bank (GB) yellowtail flounder under the Multispecies FMP. FW 48 adopted a sub-ACL of GB yellowtail flounder beginning in FY 2013. If the U.S. TAC (equal to the U.S. ABC) for GB yellowtail flounder is exceeded, the U.S./Canada Resource Sharing Understanding requires that the U.S. TAC for the following fishing year be reduced by the amount of the overage.

To be provided.

7.4.2.1.2 Option 2: Accountability Measure for the Small-Mesh Fishery Georges Bank Yellowtail Flounder Sub-ACL

Two options (one with two sub-options) are being considered for the small-mesh fishery AM.

Sub-Option A: If the sub-ACL is zero for the small-mesh fishery, or a sub-ACL is not specified, then vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches would be prohibited from fishing in the Georges Bank yellowtail flounder stock area (Statistical Areas 522, 525, 561 and 562). Because of the timing of availability of data for this fishery, the AM would be implemented in the fishing year following the notification of the overage.

Sub-Option B1: The AM would be implemented if both the total ACL and the small-mesh fishery sub-ACL for Georges Bank yellowtail flounder are exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of Georges Bank yellowtail flounder.

Sub-Option B2: The AM would be implemented if the small-mesh fishery sub-ACL of Georges Bank yellowtail flounder is exceeded. The AM would require that vessels fishing with bottom otter trawl gear with a cod-end mesh size of less than 5 inches to use approved selective trawl gear that reduces the catch of Georges Bank yellowtail flounder.

To be provided.

7.4.2.2 Small-Mesh Fishery Measures

7.4.2.2.1 Option 1: No Action

This option would not change existing pre-trip call-in requirements for small-mesh fisheries.

To be provided.

7.4.2.2.2 Option 2: Call-in Requirements for Small-Mesh Fisheries

This option would require small-mesh fisheries in the Georges Bank yellowtail flounder stock area (522, 525, 561,or 562) to request an observer prior to leaving the dock for a trip.

To be provided.

7.4.2.3 Management Measures for US/CA TACs

7.4.2.3.1 Option 1: No Action

If this option is adopted, the U.S./Canada TACs would be specified at the beginning of the fishing year, and there would be no in-season adjustments to the U.S./Canada TACs. This option would not consider the quota trading mechanism established by the TMGC and U.S./Canada Steering Committee, and would not allow additional quota to be distributed to the U.S. at the end of the Canadian fishing year (December). Under this option, there would also be no adjustment to the amount of the U.S. TAC for eastern GB haddock that is allocated to the Eastern U.S./Canada Management Area.

To be provided.

7.4.2.3.2 Option 2: Revised In-Season Adjustment for US/CA TACs

7.4.2.3.3 Option 3: Revised In-Season Adjustment for US/CA TACs

7.4.2.3.4 Option 4: Revised In-Season Adjustment for US/CA TACs

7.4.2.3.5 Option 5: Distribution of US TACs for Eastern/Western Georges Bank Haddock

Sub-Option A: If this option is adopted, the Regional Administrator, in consultation with the Council, would be allowed to adjust the portion of the U.S. TAC for Eastern GB haddock that is available in the Eastern U.S./Canada Area.

Sub-Option B: A sector, or state-operated permit bank, may convert its Eastern GB haddock ACE to Western GB haddock ACE at any time during the fishing year, and up to 2 weeks into the following fishing year (unless otherwise instructed by NMFS) to cover any overage during the previous fishing year.

To be provided.

7.4.2.4 Georges Bank Yellowtail Flounder Management Measures

7.4.2.4.1 Option 1: No Action

If this option would be adopted, there would be no changes to the management measures for GB yellowtail flounder for estimating discards.

Option 1 would not change the current discard rates used for GB yellowtail quota monitoring nor does it change the existing regulatory requirements for the small-mesh bottom-trawl fishery. No new economic impacts are expected.

7.4.2.4.2 Option 2: Revised Discard Strata for GB Yellowtail Flounder

This option would modify the stratification used for estimating discards of GB yellowtail flounder for in-season quota monitoring of sector catches. It would not change the stratification used in assessments, nor would it change the stratification used to monitor common pool fishing trips.

Option 2 would modify the spatial stratification used to estimate discards for in-season quota monitoring. A separate discard rate would be calculated for statistical area 522 from all other GB yellowtail flounder statistical areas. There are a number of potential economic impacts associated with this option. If the discard rate is lowered in area 522, vessels fishing in that area will be able to expend less GB yellowtail quota on each trip, increasing net revenues by allowing for more fishing. This is expected to have the largest effect on trawl vessels since they are the vessels that predominantly fish in area 522. If area 522 is removed from the discard rate calculation for other areas, it is likely the discard rate for other areas would be higher than in the past (Section 7.1.2.4.2). This will represent decreased net revenues to vessels fishing in those areas because the opportunity cost of quota will likely increase. If area 522 becomes relatively more profitable to fish in than the other statistical areas, there could be a shift in spatial effort to area 522 by other trawl vessels. This could have unforeseen impacts on area-specific fishing levels, which could have negative long-term MSY consequences.

7.4.2.5 Prohibition on Possession of Yellowtail Flounder by the Limited Access Scallop Fishery

7.4.2.5.1 Option 1: No Action

For limited access scallop fishery vessels, there would be no trip limit for yellowtail flounder stocks (GB and SNE/MA) and limited access scallop vessels will be required to land all legal-sized yellowtail flounder that is caught, as established in FW44 to the Groundfish FMP.

7.4.2.5.1 Option 2: Prohibition on Possession of Yellowtail Flounder

For limited access scallop fishery vessels, there would be zero possession of yellowtail flounder stocks (GB and SNE/MA). Under this option, yellowtail flounder could not be landed or sold by the limited access scallop fishery.

To be provided.

References

Murphy T, Kitts A, Records D, Demarest C, McPherson M, Walden J, Caless D, Bing-Sawyer E, Steinback S, Olson J. 2012. 2011 Final Report on the Performance of the Northeast Multispecies (Groundfish) Fishery (May 2011-April 2012). December 2012. Woods Hole (MA): NOAA Fisheries Northeast Fisheries Science Center. 12-30. 1111 p.

NMFS. 2007. Guidelines for the Economic Review of National Marine Fisheries Service Regulatory Actions. Washington (DC): NMF Service. 49 p.