7.4 ECONOMIC IMPACTS

The following sections analyze the economic impacts of the management alternatives considered in Framework 29 and compare these with two baselines, No Action alternative and Status Quo scenario. The objective of the cost-benefit analysis is to evaluate the net economic benefits arising from changes in consumer and producer benefits that are expected to occur with implementation of a regulatory action. As the NMFS Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007) [1] state "the proper comparison is '*with the action' to 'without the action'* rather than to *'before and after the action,*' since certain changes may occur even without action and should not be attributed to the regulation." The guidelines also state that "No Action alternative does not necessarily mean a continuation of the present situation, but instead is the most likely scenario for the future, in the absence of other alternative actions"[2]. Even without action, the scallop stock abundance in open and access areas will be different, and as a result, landings, scallop prices, fishing costs, revenues and benefits from the fishery would change compared to the present levels. The Status Quo scenario as projected in this Framework action reflects this reality and, in addition to the No Action alternative, is used as one of the baselines to assess economic impacts of the proposed measures especially for the purposes of E.O.12866.

While NMFS 2007 guidelines indicate "The No Action alternative should be the basis of comparison for other alternatives", it very often use the terms "No Action" and "Status Quo" interchangeably[3]. The economic analyses presented in this section make a distinction in the definition of those terms, however, with "No Action" referring to a "regulatory" baseline and "Status Quo" referring to a state with no changes from the present allocations for open area DAS and access area trips. The definition of "No Action" as described in Section 2.2.1.1 of the document refers to the default measures that are specified in Framework 28 until the next Framework action is implemented. No Action alternative is used as one of the baselines for comparison of the biological and economic impacts of the proposed specification measures to those of default measures in accordance with the NMFS guidelines.

However, default measures are temporary in nature and as such, allocations under those measures are usually set at considerably lower levels than the allocations either in the current (in 2017) or the projected allocations in the next fishing year (2018) to prevent fishing effort exceeding the sustainable levels due to the delays in the implementation of the proposed measures in next Framework Action. As a result, the projections for landings, revenues and economic benefits under the No Action alternative are considerably lower than the current levels and the levels that are expected under the proposed measures. Because of this, when economic

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[1] Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions, March 2007, http://www.nmfs.noaa.gov/sfa/domes_fish/EconomicGuidelines.pdf

[2] Ibid, p.12

[3] For example, see p. 15 of 2007 NMFS guidelines: "For economic analysis of regulatory actions, changes in net benefits are measured by the difference in the present value of the discounted stream of net benefits of regulatory action, as compared to the status quo. In this context, a positive result means that the net present value of the regulatory action exceeds that of the status quo."

benefits of the proposed alternatives are estimated using No Action as the baseline, the impacts on the economy are overstated in the short-term compared to the present circumstances.

OMB recommends using more than one baseline when the choice of baseline will significantly affect estimated benefits and costs. [4] For these reasons, the economic analyses in this framework also include a Status Quo scenario *(SQ)* to provide an assessment of how landings, revenues and total economic benefits from the scallop fishery would change if the current allocations were continued in 2015 but taking into account the impacts of projected changes in the productivity and the spatial distribution of the scallop resource on landings, revenues and total economic benefits. From that perspective, SQ is a more realistic baseline to assess the impacts of the proposed measures on the economy from the perspective of E.O.12866.

As the Guidelines for Economic Analysis of Fishery Management Actions specify, "benefits and costs are measured from the perspective of the Nation, rather than from that of private firms or individuals. Benefits enjoyed by other nations are not included, although tax payments by foreign owners, and export revenues, are benefits to the Nation."

Because fishery management actions in general result in short-term costs for the industry in terms of foregone revenue, "choosing a period of analysis that is too short may bias the analysis toward costs, where costs are incurred in the short-term and benefits are realized later." Similarly, the Office of Management and Budget (OMB, 2003) indicated that the analyses should "present the annual time stream of benefits and costs expected to result from the rule," and state that "the beginning point for your stream of estimates should be the year in which the final rule will begin to have effects" and "the ending point should be far enough in the future to encompass all the significant benefits and costs likely to result from the rule."[5] For these reasons, guidelines indicate that "a reasonable attempt should be made to conduct the analysis over a sufficient period of time to allow a consideration of all expected effects."

Furthermore, the economic impacts of the proposed regulations over the long-term should be evaluated by the discounted cumulative present value of the stream of benefits since benefits or costs that occur sooner are generally more valuable (or have a positive time preference). Discount rate is the interest rate used in calculating the present value of expected yearly benefits and costs.

This section examines the economic impacts of the proposed regulations in Framework 29. Although Framework 29 is a one year action, it will have impacts on the future yield from scallop resources, on scallop revenues and total economic benefits. The short- and the long-term economic impacts of the specification alternatives are analyzed in Section 7.4.2. The present value of long-term benefit and costs of the specification alternatives are estimated using both a 3% and a 7% discount rate. The higher discount rate provides a more conservative estimate and a lower bound for the economic benefits of alternatives compared with the benefits predicted using a lower discount rate.

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[4] Circular A-4, September 17, 2003, http://www.whitehouse.gov/sites/default/files/omb/assets/regulatory_matters_pdf/a-4.pdf

[5] OMB Circular A-4 (September 17, 2003), http://www.whitehouse.gov/omb/circulars_a004_a-4/

7.4.1 Acceptable Biological Catch

7.4.1.1 No Action ABC

Reauthorization of the MSA requires the SSC to set an acceptable biological catch (ABC), or maximum catch level that can be removed from the resource taking into account all sources of biological uncertainty. The Council is prohibited from setting catch limits above that level. This requirement is expected to have long-term economic benefits on the fishery by helping to ensure that catch limits and fishing mortality targets are set at or below ABC. This should help prevent overfishing and optimize yield on a continuous basis. Under "No Action" for FY 2017, the overall ABC for each year would be identical to that of the default FY 2017 ABC for the fishery. No Action ABC (43,142 mt.) after discards removed is about 7% lower than the proposed ABC in this action because biomass has increased from 2017 levels. Therefore, the potential impacts of the No Action ABC on economic benefits are negative.

7.4.1.2 Alternative 2 - ABC for 2017 and default for 2018

The updated ABC estimates (45,950 mt. after discards removed) for 2018 are about 7% higher and the default ABC estimates for 2019 (45,805 mt.) are about 6% higher than the No Action values because updated surveys suggest scallop biomass is higher than previous estimates. Overall, using these estimates to set fishery specifications should have positive economic impacts over the long-term because the ABC values were determined based on the recent surveys and best available science to prevent overfishing of the scallop resource.

7.4.2 Economic impacts of the proposed specification alternatives

7.4.2.1 Specification alternatives and potential OHA2 scenarios

Table 1. Potential OHA2 Scenarios in FW 29

#	OHA2 Specification Scenarios in FW29
1	Status Quo – No change to current habitat and groundfish closures.
2	Approval and implementation of both Georges Bank measures (Alternative 10 in 2.3.4 of OHA2) and Great South Channel and Southern New England (Alternative 4 in Section 2.3.5 of OHA2)
3	Approval and implementation of only Great South Channel and Southern New England measures through OHA2
4	Approval and implementation of only Georges Bank measures though OHA2

Table 2. Specification alternatives under consideration in FW 29, including descriptions of spatial management, with corresponding OHA2 scenario

LABEL	Description	Scenario #
NA	No Action - FW28 Default Measures	1
SQ	Status Quo - Same measures approved through FW28	1
BASE36	BASE Configuration of 5 AA trips, 1 in CAII, 1 in NLS-S, 3 in MAAA with open area F=0.36	1
BASE40	BASE configuration with open area F=0.4	1
S-BASE44	Sensitivity of BASE runs assuming open area F=0.44	1
NLSW36	Only NLS EFH opens, and NLS-West AA available. 5 AA trips: 1 in NLS-S, 2 in NLS-W, 2 in MAAA with open area F=0.36	3
NLSW40	Only NLS EFH opens, and NLS-West AA available. 5 AA trips: 1 in NLS-S, 2 in NLS-W, 2 in MAAA with open area F=0.4	3
5BOTH36	Both CAI and NLS available. 5 AA trips: 1 in CAI, 2 in NLS-W, 2 in MAAA with open area F=0.36	2
5BOTH40	Both CAI and NLS available. 5 AA trips: 1 in CAI, 2 in NLS-W, 2 in MAAA with open area F=0.4	2
6BOTH295	Both CAI and NLS available. 6 AA trips: 1 in CAI, 1 in NLS-S, 2 in NLS-W, 2 in MAAA with open area F=0.295	2
6BOTH26	Both CAI and NLS available. 6 AA trips: 1 in CAI, 1 in NLS-S, 2 in NLS-W, 2 in MAAA with open area F=0.295	2
CA1F35	Only CAI open. 5 AA trips: 1 in CAI, 1 in CAII, 1 in NLS-S, 2 in MAAA with F=0.36	4

7.4.2.2 Summary of economic impacts

Short-term impacts– 2018

- In general, the specification alternatives under OHA2 scenarios which opens both Closed Area I North HMA and/or Nantucket Lightship EFH for access in FW29 result in higher benefits compared to Status Quo OHA measures (Scenario 1). However, under the status quo OHA measures, specification scenario which assumes an open area F=0.44 (S-BASE 44) would have slightly higher benefits compared to alternative with only CA1 open (C1F36) in 2018. This is because Scenarios 2, 3, and 4 redirect fishery effort away from Closed Area II in 2018 to more productive areas, that is, either or both to Closed Area I and NLS-West with larger scallops and higher densities (Table 3).

- The specification alternatives that allow access to NLS and CAI (5BOTH40, with 5 AA trips and open area F=0.5 and 6BOTH295 with 6 AA trips and open area F=0.295) as well the alternative that provides 4 AA trips to NLS-West with open area F=0.36 (NLSW40) have the highest landings, revenues and total benefits in 2018. Total revenues under these under these alternatives are estimated to exceed the status quo scenario (continuation of FRM 28 measures) by over $160 million in 2018. Total economic benefits net of SQ values are estimated to be about $180 million under the same options. BASE36, BASE40 and C1F36 has lowest benefits net of SQ values, followed by S-BASE44 (Table 3).

- Among the specification alternatives with status quo OHA measures (Scenario 1), BASE configuration with open area F=0.40 (BASE 40) results in highest revenues and total economic benefits. Under scenario 2 which provides access to both CA1 and NLS-West , the alternative that provides 6 AA trips (1 in CAI, 1 in NLS-S, 2 in NLS-W, 2 in MAAA) with open area F=0.295 has the highest revenues and total economic benefits. Among the alternatives under Scenario 3 (Great South Channel and Southern New England measures through OHA2), the alternative with open area F=0.4 (NLSW40) has higher economic benefits than the option with open area F=0.36 (NLSW36). The alternative with only CA1 open through OHA2 results in lower revenues and total economic benefits compared to OHA2 scenarios 2 and 3, but higher economic benefits compared to SQ and BASE runs (BASE36 and BASE40) except for the one that provides access to open areas at F=44 (Table 3).

Long-term impacts– 2018 to 2032

- The results are expected to be similar over the long-term and the differences in economic benefits of various specification alternatives within the same OHA2 scenario group are small both in the short- and long-term.

- Present value of the cumulative economic benefits net of SQ would be higher for all the specification alternatives under OHA2 Scenario 2 that allows access to both CA1 and NLS-West whether the long-term benefits are discounted at 3% or 7% (**Table 4** and **Table 5**). Specification alternative 6BOTH295 results in slights higher benefits than others in this group. Present value of the estimated total revenues net of SQ values would range from $690 million to $700, and present value of the cumulative net economic benefits would range from $832 million to $858 million using a discount rate of 3%. A higher discount rate at 7%, do not alter the rank of alternatives, although the cumulative present value of revenues and total economic benefits would be lower due to the discounting the long-term benefits at a higher rate (Table 5) .

- Total revenues and economic benefits for NLSW40 (only NLS opens) are expected to be about the same as the 5BOTH36 and 5BOTH40 compared to scenarios which makes both CA1 and NLS available for scallop fishing whether benefits are discounted at 3% or at 7%. The alternative with open area F=0.36 (NLS36) would results in higher economic benefits compared to SQ values as well with the long-term present value of the scallop revenues exceeding the SQ benefits by $490 million at discount rate of 3% and by $444 million at a rate discount rate of 7%. However, long-term revenues under this option would be about $150 million (7% discount rate) to $200 million (3% discount rate) less compared to alternative NLSW40 (Table 4 and Table 5).

- Having only CA1 open with 5 AA trips (CA1F35) results in economic impacts similar to S-BASE44 with open areas fished at F=0.44 in the short-term. However, over the long-term, economic benefits of this scenario greatly exceed the benefits of all base runs under the OHA2 status quo measures including the SQ (continuation of FRM 28 measures). Nevertheless, compared to the specification alternatives which allow access to NLS-West and both CA1 and NLS-West, this alternative results in considerably lower benefits both in the short- and the long-term. For example, at a discount rate of 7%, present value of revenues

net of SQ values would be about $234 million for CA1F35 while it would exceed $600 million for the alternatives that provide access to NLS-West as well (Table 5).

- The numerical results of these analyses should be interpreted with caution and should be used solely to compare one alternative with another. The costs and the benefits of the alternatives were analyzed based on the biological projections of landings, DAS and LPUE and the available information about the vessel costs and characteristics and price model. Actual value of landings, size composition and other biological variables are likely to be different, at least to some extent, than the projected values due to scientific and management uncertainties. Price projections are derived from the price model presented in the Appendix which estimated the impact of landings and size composition on prices after taking into account the impact of exogenous variables including the import prices, per capita disposable income and scallop imports from Japan and Canada as a proxy of changes in international markets for large scallops. Future price projections hold all the exogenous explanatory variables constant in order to estimate the economic impacts of alternative management measures on landings, scallop size composition, LPUE and effort. Actual prices will be different than estimated depending on the differences in actual landings and size composition form projected values as well as due to changes inflation, consumer demand, price and composition of imports.

Table 3 - Economic Impacts for 2018: Estimated landings (Mill.lb.), revenue and economic benefits (Mill. $, in 2017 dollars)

Scenario	Landings	Price	Revenue	Revenue - Difference from SQ	Producer Surplus	Consumer Surplus	Total Benefits	Total Benefits - Difference from SQ
NA	25	13.80	340	***(233)***	270	10	280	***(242)***
SQ	44	13.00	573		489	33	522	
BASE36	52	12.32	641	***68***	555	41	596	***74***
BASE40	54	12.25	659	***87***	572	44	616	***94***
S-BASE44	56	12.18	677	***104***	588	46	634	***113***
5BOTH36	58	12.34	713	***140***	626	53	680	***158***
5BOTH40	60	12.24	733	***161***	645	57	702	***180***
6BOTH295	60	12.22	734	***161***	647	56	703	***181***
6BOTH26	58	12.32	713	***141***	628	53	680	***158***
NLSW36	58	12.07	698	***125***	610	50	661	***139***
NLSW40	60	12.24	733	**161**	645	57	702	**180**
C1F36	53	12.56	665	***93***	581	46	627	***105***

Table 4 - Long-term Economic Impacts (2018-2032): Cumulative present value of revenues, producer surplus and total economic benefits *net of Status quo* values (in 2017 dollars, 3% Discount rate)

Scenario	Landings	Price	Revenue	Revenue - Difference from SQ	Producer Surplus	Consumer Surplus	Total Benefits	Total Benefits - Difference from SQ
NA	909	12.05	8,872	(88)	7,706	758	8,464	(64)
SQ	911	12.03	8,960		7,789	739	8,528	
BASE36	914	12.01	9,007	47	7,838	740	8,579	51
BASE40	914	12.01	9,011	51	7,842	739	8,581	53
S-BASE44	914	12.01	9,014	54	7,844	739	8,583	54
5BOTH36	995	11.82	9,650	690	8,446	915	9,361	832
5BOTH40	995	11.82	9,655	695	8,450	913	9,364	835
6BOTH295	997	11.82	9,667	707	8,462	919	9,381	853
6BOTH26	997	11.82	9,660	700	8,456	920	9,377	848
NLSW36	970	11.87	9,450	490	8,255	852	9,107	579
NLSW40	995	11.82	9,655	695	8,450	913	9,364	835
C1F36	940	11.97	9,232	273	8,054	802	8,856	327

Table 5 - Long-term Economic Impacts (2018-2032): Cumulative present value of revenues, producer surplus and total economic benefits net of Status quo values (in 2017 dollars, 7% Discount rate)

Scenario	Landings	Price	Revenue	Revenue - Difference from SQ	Producer Surplus	Consumer Surplus	Total Benefits	Total Benefits - Difference from SQ
NA	909	12.05	7,066	(97)	6,134	616	6,750	(76)
SQ	911	12.03	7,163		6,227	600	6,827	
BASE36	914	12.01	7,211	47	6,276	601	6,877	50
BASE40	914	12.01	7,216	53	6,280	600	6,881	54
S-BASE44	914	12.01	7,220	57	6,284	600	6,884	57
5BOTH36	995	11.82	7,771	608	6,806	753	7,559	733
5BOTH40	995	11.82	7,778	615	6,812	752	7,564	737
6BOTH295	997	11.82	7,790	627	6,824	757	7,581	755
6BOTH26	997	11.82	7,782	619	6,817	758	7,575	749
NLSW36	970	11.87	7,607	444	6,649	701	7,350	524
NLSW40	995	11.82	7,778	615	6,812	752	7,564	737
C1F36	940	11.97	7,398	234	6,455	652	7,107	281

7.4.2.3 Landings and size composition

Projected values of landings show that landings could vary from over 50 million to 60 million pounds in 2018 (except for no Action and SQ scenarios) but could reach over 80 to 90 million pounds in 2019. However, over the long-term the value of landings are expected to be stabilize about 55 to 60 million pounds (Table 6). The alternatives that result in highest landings usually have a higher proportions of U10 scallops (about 11% for alternatives that provide access to NLS-West and CA1) and consequently higher LPUEs (Table 7, Table 9 and Table 11).

Table 6. Estimated landings (Million lb., Average per fishing year)

Scenario group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	**NA**	25	96	75	56	61
	SQ	44	84	74	56	61
	BASE36	52	80	74	56	61
	BASE40	54	79	73	56	61
	S-BASE44	56	78	73	56	61
2	**5BOTH36**	58	95	85	59	66
	5BOTH40	60	94	84	59	66
	6BOTH26	58	96	85	59	66
	6BOTH295	60	96	85	59	66
3	**NLSW36**	58	94	81	57	65
	NLSW40	60	94	84	59	66
4	**C1F36**	53	81	77	58	63

Table 7. Projected landings of U10 scallops (Mill.lb.)

Scenario Group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	NA	1.4	7.8	5.5	7.2	6.5
	SQ	5.6	3.3	5.1	7.1	6.3
	BASE36	2.6	6.7	5.4	7.2	6.5
	BASE40	2.8	6.5	5.3	7.2	6.5
	S-BASE44	2.9	6.4	5.2	7.2	6.4
2	5BOTH36	6.2	6.7	8.1	8.6	8.2
	5BOTH40	6.3	6.6	8.0	8.6	8.2
	6BOTH26	5.7	7.1	8.4	8.6	8.3
	6BOTH295	5.9	7.0	8.3	8.6	8.2
3	NLSW36	2.1	6.7	6.3	7.7	7.0
	NLSW40	6.3	6.6	8.0	8.6	8.2
4	C1F36	6.7	6.7	7.2	8.0	7.7

Table 8. Historical landings of scallops by size category (Mill.lb.)

Fishyear	U10	11+	NA	Grand Total
2005	6.9	44.2	3.8	54.9
2006	13.3	40.3	3.8	57.3
2007	14.9	41.8	4.4	61.1
2008	12.3	38.3	2.0	52.6
2009	8.4	48.2	1.6	58.2
2010	8.9	48.0	1.1	58.1
2011	8.6	48.8	1.3	58.6
2012	10.5	45.3	1.4	57.2
2013	8.7	30.5	1.3	40.4
2014	8.0	23.5	1.1	32.6
2015	6.1	29.1	1.1	36.4
2016	4.7	35.8	1.4	42.0
2017	6.4	20.9	0.4	27.7

Table 9. Biological projections - Percentage share of U10 scallops in total landings

Scenario Group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	NA	6%	8%	7%	13%	11%
	SQ	13%	4%	7%	13%	11%
	BASE36	5%	8%	7%	13%	11%
	BASE40	5%	8%	7%	13%	11%
	S-BASE44	5%	8%	7%	13%	11%
2	5BOTH36	11%	7%	10%	15%	13%
	5BOTH40	11%	7%	10%	15%	13%
	6BOTH26	10%	7%	10%	15%	13%
	6BOTH295	10%	7%	10%	15%	13%
3	NLSW36	4%	7%	8%	14%	11%
	NLSW40	11%	7%	10%	15%	13%
4	C1F36	13%	8%	9%	14%	13%

Table 10. Percentage composition of scallop landings by size categories

Fishyear	U10	11+	NA	Grand Total
2005	13%	81%	7%	100%
2006	23%	70%	7%	100%
2007	24%	68%	7%	100%
2008	23%	73%	4%	100%
2009	15%	83%	3%	100%
2010	15%	83%	2%	100%
2011	15%	83%	2%	100%
2012	18%	79%	2%	100%
2013	21%	75%	3%	100%
2014	25%	72%	3%	100%
2015	17%	80%	3%	100%
2016	11%	85%	3%	100%
2017	23%	75%	2%	100%

Table 11. Landings per unit of effort estimates of scallops (LPUE)

Scenario group	Scenario	2018	2019	2020-2022	2023-2032	Grand Total
1	NA	2,315	2,355	2,370	2,471	2,433
	SQ	2,324	2,282	2,358	2,469	2,425
	BASE36	2,571	2,311	2,345	2,469	2,440
	BASE40	2,555	2,302	2,342	2,469	2,438
	S-BASE44	2,537	2,294	2,339	2,469	2,436
2	5BOTH36	2,798	2,435	2,456	2,492	2,501
	5BOTH40	2,770	2,426	2,453	2,492	2,498
	6BOTH26	2,859	2,450	2,458	2,491	2,506
	6BOTH295	2,837	2,443	2,456	2,491	2,504
3	NLSW36	2,721	2,426	2,424	2,473	2,476
	NLSW40	2,770	2,426	2,453	2,492	2,498
4	C1F36	2,695	2,321	2,379	2,486	2,467

7.4.2.4 Prices and Revenue

Prices are estimated using the ex-vessel price model that takes into account the impacts of changes in domestic landings, exports, import prices, income of consumers, composition of landings by market category (i.e., size of scallops), and changes in international markets for large scallops using imports of Japanese and Canadian scallops as proxy variables (Appendix I. Price Model).

The price estimates shown in Table 12 correspond to the price model outputs assuming that the import prices will be constant at their 2017 levels, scallop exports will constitute about 40% of the domestic landings and the disposable income, ratio of Japanese and Canadian imports to total scallops import will be constant at the current levels in 2017, so that only the effects of the reduction in and changes in the size composition of landings could be identified. In additions, price estimates reflect real (as opposed to nominal) prices since they are expressed in 2017 constant prices assuming inflation will be zero in the future years. Therefore, actual real or nominal prices could be higher (lower) than the values estimated in Table 12 if the import prices, exports and disposable income increase (decrease) in the future years. Nominal prices will probably higher in the future as well since it is unusual for the inflation to remain at zero. In addition, ex-vessel prices could be underestimates of true values because the biological model underestimates the proportion of U10s in landings and it doesn't have a separate category for U12 scallops.

Although the absolute values for revenues, producer and consumer surpluses, and total economic benefits would change with the value of estimated prices, the differences of these values for all the alternatives to the No Action or Status Quo scenarios would not change in any substantial

way. Higher prices than estimated in **Table 12** would increase the short-term positive impact of all alternatives on revenues compared to No Action and SQ, while lower prices would reduce this impact. Absolute values of short- and long-term revenues and economic will be greater with higher prices and smaller with lower prices, but the ranking of alternatives are not expected to change than presented in the tables below (**Table 13** to **Table 20**).

Table 12. Estimated ex-vessel prices (in 2017 dollars)

Scenario group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	NA	13.80	10.28	11.19	12.32	12.05
	SQ	13.00	10.55	11.22	12.32	12.03
	BASE36	12.32	10.94	11.24	12.32	12.01
	BASE40	12.25	10.96	11.25	12.32	12.01
	S-BASE44	12.18	10.98	11.26	12.32	12.01
2	5BOTH36	12.34	10.39	10.88	12.20	11.82
	5BOTH40	12.24	10.42	10.90	12.20	11.82
	6BOTH26	12.32	10.35	10.88	12.20	11.82
	6BOTH295	12.22	10.37	10.89	12.20	11.82
3	NLSW36	12.07	10.43	10.98	12.26	11.87
	NLSW40	12.24	10.42	10.90	12.20	11.82
4	C1F36	12.56	10.87	11.17	12.25	11.97

Table 13. Scallop revenue per Fishyear (Million $, in 2017 dollars, not discounted)

Scenario Group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	NA	340	992	841	692	718
	SQ	573	888	829	690	723
	BASE36	641	872	826	691	727
	BASE40	659	866	823	691	727
	S-BASE44	677	860	820	691	727
2	5BOTH36	713	987	919	716	775
	5BOTH40	733	981	916	716	775
	6BOTH26	713	997	920	716	775
	6BOTH295	734	991	918	716	776
3	NLSW36	698	978	891	704	759
	NLSW40	733	981	916	716	775
4	C1F36	665	885	856	704	744

7.4.2.5 Estimated impacts on DAS, fishing costs and open area days and employment

Total effort measured in terms of DAS used as a sum total of all areas will be higher in the short-term for all the alternatives compared to SQ scenario which allocates fewer DAS and access trips. Changes in employment level in the scallop fishery as measured by CREW*DAS will be proportional to total effort under all alternatives compared to No Action and SQ. Because overall DAS will increase under all alternatives compared to the levels under No Action and SQ in 2018, employment is 4expected to increase as well (Table 9). However, in 2019, total DAS and employment is estimated to be less under all the BASE specifications and also under CF136 by about 5% to over 7% compared to SQ while under other alternatives, it is expected to increase by over 5% (Table 14). Over the long-term, total effort and employment is expected to be higher compared to SQ under all alternatives except for BASE specifications. Even though, employment in terms of CREW*DAS would be lower under some options and higher on others, it is uncertain to what extent this would lead to a reduction or increase in the actual numbers of crew employed.

Trip costs for all the alternatives are expected to be higher than SQ levels in 2018, but have small differences in magnitude from one alternative to the other as well as compared to SQ over the long-term (Table 17).

Table 14. Projected DAS per FT vessel per year (including open and access areas)

Scenario group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	NA	30	115	89	64	70
	SQ	53	103	88	64	71
	BASE36	57	97	88	64	70
	BASE40	59	96	88	64	70
	S-BASE44	61	96	88	64	71
2	5BOTH36	58	109	97	66	75
	5BOTH40	61	109	97	66	75
	6BOTH26	57	110	97	66	75
	6BOTH295	59	110	97	66	75
3	NLSW36	60	108	94	65	73
	NLSW40	61	109	97	66	75
4	C1F36	55	98	91	65	72

Table 15. Percentage change in total DAS from SQ levels (open and access areas)

Scenario	2018	2019	2020-2022	2023-2032	2018-2032
NA	-43.8%	11.1%	1.2%	0.2%	-0.7%
SQ					
BASE36	6.7%	-6.4%	-0.1%	0.1%	-0.2%
BASE40	11.2%	-6.9%	-0.4%	0.1%	-0.1%
S-BASE44	15.5%	-7.4%	-0.6%	0.1%	0.0%
5BOTH36	8.9%	5.9%	9.7%	4.0%	5.8%
5BOTH40	14.1%	5.2%	9.4%	3.9%	5.9%
6BOTH26	6.8%	6.7%	9.8%	3.9%	5.8%
6BOTH295	11.7%	6.1%	9.5%	3.9%	5.9%
NLSW36	12.1%	4.7%	6.8%	2.3%	4.2%
NLSW40	14.1%	5.2%	9.4%	3.9%	5.9%
C1F36	3.8%	-4.9%	2.8%	1.9%	1.6%

Table 16. Projected open-area DAS per FT vessel per year

Scenario group	Scenario	2018	2019	2020-2022	2023-2032	Grand Total
1	NA	22	45	56	55	52
	SQ	25	44	55	55	52
	BASE36	23	43	54	55	52
	BASE40	26	42	54	55	52
	S-BASE44	28	42	54	55	52
2	5BOTH36	28	43	55	55	52
	5BOTH40	31	42	55	55	52
	6BOTH26	21	44	56	55	52
	6BOTH295	24	44	56	55	52
3	NLSW36	28	43	55	55	52
	NLSW40	31	42	55	55	52
4	C1F36	23	43	55	55	52

Table 17. Trip costs per year for the scallop fleet (Undiscounted, in million 2017 dollars)

Scenario group	Scenario	2018	2019	2020-2022	2023-2032	2018-2032
1	NA	18	69	54	39	42
	SQ	32	62	53	38	43
	BASE36	34	58	53	39	43
	BASE40	36	58	53	39	43
	S-BASE44	37	58	53	39	43
2	5BOTH36	35	66	58	40	45
	5BOTH40	37	66	58	40	45
	6BOTH26	34	67	59	40	45
	6BOTH295	36	66	58	40	45
3	NLSW36	36	65	57	39	44
	NLSW40	37	66	58	40	45
4	C1F36	33	59	55	39	43

7.4.2.6 Present Value of Producer Surplus, Consumer Surplus and Total Economic Benefits

Producer surplus (benefits) for a particular fishery shows the net benefits to harvesters, including vessel owners and crew, and is measured by the difference between total revenue and operating costs. In technical terms, the producer surplus (PS) is defined as the area above the supply curve

and the below the price line of the corresponding firm and industry (Just, Hueth & Schmitz (JHS)-1982). The supply curve in the short-run coincides with the short-run marginal cost above the minimum average variable cost. This area between price and the supply curve can then be approximated by various methods depending on the shapes of the marginal and average variable cost curves.

The economic analysis presented in this section used the most straightforward approximation and estimated PS as the excess of total revenue (TR) over the total variable costs (TVC) minus the opportunity costs of labor and capital. The fixed costs were not deducted from the producer surplus since the producer surplus is equal to profits plus the rent to the fixed inputs.

It must also be emphasized that the empirical results of the economic analyses should be used to compare alternatives with each other and with No Action or Status Quo rather than to estimate the absolute values since the later will be change according to the several external variables that affect prices, revenues and costs including changes in import prices, exports of scallops, disposable income of consumers, size composition of scallop landings, oil prices and inflation.

Consumer surplus for a particular fishery is the net benefit that consumers gain from consuming fish based on the price they would be willing to pay for them. Consumer surplus will increase when fish prices decline and/or the amount of fish harvested goes up. Present value of the consumer surplus (using a 7% discount rate), and the cumulative present values net of Status Quo levels are summarized in Table 19.

Economic benefits include the benefits both to the consumers and to the fishing industry, and equal the sum of benefits to the consumers and producers. The cumulative present value of the total benefits are and economic benefits net of Status Quo (SQ) levels are shown in Table 20 (7% discount rate). The cumulative present value of economic benefits are also estimated in Table 4 at a 3% discount rate. Discounting future benefits at a lower level resulted in higher benefits for all options without changing the ranking of the alternatives in terms of magnitude of benefits.

Table 18. Present value of producer surplus (using 7% discount rate, Million $, in 2017 dollars)

Scenario	2018	2019	2020-2022	2023-2032	Grand Total
NA	270	813	1808	3243	6134
SQ	489	722	1781	3234	6227
BASE36	555	711	1772	3238	6276
BASE40	572	706	1765	3237	6280
S-BASE44	588	701	1759	3236	6284
5BOTH36	626	812	1989	3380	6806
5BOTH40	645	806	1982	3379	6812
6BOTH26	628	821	1992	3377	6817
6BOTH295	647	815	1987	3376	6824
NLSW36	610	804	1923	3312	6649
NLSW40	645	806	1982	3379	6812
C1F36	581	723	1843	3309	6455
Producer Surplus net of SQ values					
NA	-219	90	27	9	-93
BASE36					
BASE40	66	-11	-10	4	49
S-BASE44	83	-16	-16	3	53
5BOTH36	99	-21	-22	2	57
5BOTH40	137	89	207	146	579
6BOTH26	156	84	201	145	585
6BOTH295	138	98	211	143	590
NLSW36	157	93	205	142	597
NLSW40	121	81	142	78	422
C1F36	156	84	201	145	585

Table 19. Present value of consumer surplus (CS) using 7% discount rate (in 2017 dollars, Million $) do

Scenario	2018	2019	2020-2022	2023-2032	Grand Total
NA	10	121	204	282	616
SQ	33	91	197	279	600
BASE36	41	85	194	281	601
BASE40	44	84	193	281	600
S-BASE44	46	82	191	280	600
5BOTH36	53	117	261	322	753
5BOTH40	57	115	259	321	752
6BOTH26	53	121	263	321	758
6BOTH295	56	119	261	321	757
NLSW36	50	114	237	300	701
NLSW40	57	115	259	321	752
C1F36	46	88	216	302	652
Consumer Surplus net of SQ values					
NA	-23	30	7	2	16
BASE36	8	-6	-2	2	2
BASE40	11	-8	-4	1	1
S-BASE44	14	-9	-6	1	0
5BOTH36	20	26	64	42	153
5BOTH40	24	24	62	42	152
6BOTH26	20	30	67	42	158
6BOTH295	24	27	64	42	158
NLSW36	18	23	41	20	102
NLSW40	24	24	62	42	152
C1F36	14	-3	19	22	53

Table 20. Present value of total economic benefits (TB) using 7% discount rate (in 2017 dollars, Mill. $)

Scenario	2018-2019	2020-2022	2023-2032	Grand Total
NA	1,213	2,012	3,525	6,750
SQ	1,335	1,978	3,513	6,827
BASE36	1,392	1,966	3,519	6,877
BASE40	1,405	1,958	3,517	6,881
S-BASE44	1,418	1,950	3,516	6,884
5BOTH36	1,608	2,250	3,701	7,559
5BOTH40	1,623	2,241	3,700	7,564
6BOTH26	1,622	2,256	3,698	7,575
6BOTH295	1,637	2,248	3,697	7,581
NLSW36	1,578	2,160	3,611	7,350
NLSW40	1,623	2,241	3,700	7,564
C1F36	1,438	2,059	3,611	7,107
Total economic benefits net of SQ values				
NA	-122	34	12	-76
BASE36	57	-12	5	50
BASE40	70	-20	4	54
S-BASE44	82	-28	3	57
5BOTH36	273	272	188	733
5BOTH40	288	263	186	737
6BOTH26	286	278	185	749
6BOTH295	301	270	183	755
NLSW36	243	183	98	524
NLSW40	288	263	186	737
C1F36	103	81	97	281

7.4.3 Access Area Trip Allocations to the LAGC IFQ Component

7.4.3.1 Allocation of LAGC IFQ Trips in Access Areas

7.4.3.2 Alternative 1 – No Action (Default Measures from FW28)

Under No Action LAGC IFQ vessels would be allocated 558 trips in access areas starting on April 1. This is equivalent to default number of trips from FW28. Under No Action a small percentage of the LAGC IFQ catch could come from access areas, with the rest coming from open areas. However, the cost of fishing could be higher in the open compared to fishing in access areas which are expected to have a higher stock abundance. Usually larger scallops have a

price premium compared to smaller ones and if larger scallops are more abundant in access areas, not being able to fish in those areas could affect the revenues negatively as well. Thus, this option could have negative economic impacts on the LAGC IFQ vessels compared to other options.

7.4.3.3 Alternative 2 – 5.5% of the Access Area Allocation

Alternative 2 would allow the LAGC IFQ effort to be distributed over more areas providing opportunity to vessels to fish in more productive areas to reduce their fishing costs by catching the possession limit in a shorter time-period as well as to optimize the size composition of their landings by selectively fishing in areas abundant with larger scallops. Since larger scallops in general command a higher price, this option could also have positive impacts on revenues. The number of trips and scallops pounds allocated to access areas for the LAGC fishery is higher than Alternative 1. Therefore Alternative 2 is expected to have positive economic impacts compared to No Action.

7.4.3.4 LAGC IFQ Trips Allocations by Access Area

7.4.3.5 Alternative 1 – No Action (Default Measures from FW28)

This alternative will allocate all the access area trips for LAGC IFQ fishery to MAAA, which will prevent optimal distribution of access area trips with negative economic impacts on the vessels participating in this fishery.

7.4.3.6 Alternative 2 – Allocate LAGC IFQ Access Area Trips Proportional to Allocations in each area, and allocate the equivalent of CA II trips to evenly to Georges Bank access areas

This option would allocate LAGC IFQ access are trips proportional to the allocations in each access area. For alternatives that allocate a trip to Closed Area II, allocate trips proportionally in each access area, and allocate Closed Area II trips equally across available Georges Bank access areas (Nantucket Lightship South and Closed Area I). Alternative 2 provides more flexibility to IFQ vessels homeported in Massachusetts and in other ports in Mid-Atlantic located within close proximity to access areas. This could have positive economic benefits for LAGC vessels by reducing the trip time and costs of fishing.

7.4.4 Accountability Measures for the Northern Windowpane Flounder Sub-ACL allocated to the Scallop Fishery

This action considers a range of AM alternatives including No Action, Reactive Accountability Measure in Georges Bank Open Areas (Alternative 2), Reactive Accountability Measures in Closed Area II and Extension (Alternative 3).

7.4.4.1 Alternative 1 - No Action

Under No Action, there would be no accountability measure linked to the scallop fishery's N. windowpane flounder sub-ACL, thus, neutral economic impacts are expected in the short-term for the participants of the scallop fishery. If the scallop fishery exceeds its sub-ACL, no measures would be triggered to limit or reduce future catch of northern windowpane flounder in the scallop fishery.

If the overage by the scallop fishery is substantial causing the overall ACL to be exceeded, AMs would trigger for the groundfish fishery because there are currently no AMs specific to the scallop fishery. However, AM for N. windowpane is a regulatory requirement for FY2018. Therefore, No Action is not in compliance with NMFS regulation and guidance on ACL management,

7.4.4.2 Alternative 2 - Reactive Accountability Measure in Georges Bank Open Areas

This alternative would implement a gear restricted area (GRA) for a specified period of time with higher bycatch rates of N. windowpane, not to exceed one (1) year. The N. windowpane accountability measures would apply to both Limited Access and General Category vessels in open areas.

Although reduced flexibility and potentially reduced landings due to fishing with modified gear will have some negative economic impacts on the scallop vessels, these impacts are expected to be low. Usually, required gear modification is expected to have minor impacts on fishing costs. If a vessel switches its gear several times a year there is labor cost involved, but the gear requirements at the beginning of the year avoids having to change gear in middle of the FY.

The gear modifications will only be applied during the month of April if the overage rate is less than 20% and in both April and May if the overage is 20% or more. In terms overall landings in all open areas by LA vessels, about 14% of scallop pounds were landed in April and 21% in May as an average of 2015-2016 fishing years. On the other hand, IFQ vessels landed about 9% of their landings in open areas in April and 7% in May (Table 21). However, GB open areas constitute a subset of all open areas and in some years provided a low and in other years a high proportion of open area catch in those years. As a proportion of total catch in open areas only, LA and LAGC vessels landed in total about 1% to 29% in April (on average 7%) and from 6% to 77% in May on (average 17%) in GB areas during the fishing years from 2012 to 2016 (Table 22). In other words, the catch from GB open areas in April averaged 7% of the total open area catch in April, and averaged 17% of the total open area catch in May during 2012-2016 fishing years. Therefore, implementing GRA for both April and May could have impacts on about 24% (7%+17%) of scallop landings assuming the proportion of landings from these areas in April and May, displacing some effort to other months if some vessels that choose not to fish during these months with the modified gear.
However, total catch from these areas in April constituted only 1% of open area catch all year round and in May it constituted about 3.5% of all open area catch year round as an average during 2012-2016 fishing years. Therefore, in general, the impacts of any displacement under this alternative on annual landings are would probably be low ((Table 22).

The dredge modification in this alternative is expected to reduce catch, up to 10% fewer in terms of catch weights. Therefore, vessels may need to tow longer to attain the same amount of scallop catch, which could increase the trip costs. However, the results from this gear study demonstrated that while the modified gear caught fewer scallops, the gear is more selective at catching larger scallops and will likely reduce catches smaller scallops. In addition, given that larger scallops usually sell at a higher price, the impacts on revenues could be positive as well. Given that trip costs are usually a small proportion of scallop revenue, net revenues under this option could be higher relative to No Action.

Therefore, the net economic impacts of this Alternative compared to No Action could be neutral, or slightly positive depending on the relative impacts on landings and revenues. The results also depend on the expected landings from open areas relative to total landings in those months. However, Alternative 2 could have potentially low positive impacts compared to Alternative 3, because instead of closures, it would require fishing with modified gear in those areas for at most two months in April and May and would still allow the vessels the option to fish in other areas or seasons if they choose not to modify their gear.

The Council clarified with Alternative 2 that vessels with trawl gear are included, meaning they are not exempt from the AM. This could have low negative economic impacts on trawl vessels compared to No Action since they are unlikely to change their gear to fish in April and May in the event of an AM trigger.

Table 21. Percentage distribution of open area landings by month and permit category (2015 and 2016 fishing years)

Month	LA			LAGC- IFQ		
	2015	2016	Avg. 2015-2016	2015	2016	Avg.2015-2016
March	6%	6%	6%	10%	4%	7%
April	22%	6%	14%	14%	3%	9%
May	24%	18%	21%	10%	4%	7%
June	16%	18%	17%	9%	4%	6%
July	9%	16%	12%	9%	16%	13%
August	8%	14%	11%	11%	20%	15%
September	8%	9%	8%	8%	13%	11%
October	3%	4%	3%	5%	9%	7%
November	1%	2%	1%	6%	7%	6%
December	1%	1%	1%	7%	5%	6%
January	1%	2%	2%	6%	7%	6%
February	2%	4%	3%	5%	8%	6%
All months	100%	100%	100%	100%	100%	100%

Source: GARFO (https://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/atlanticseascallop.html)

Table 22. Total catch in live pounds from all species from NWP areas in April and May as a % of total annual catch from open areas

Fishyear	Catch from NWP areas as a % total catch in in open areas in April and May		Catch from NWP areas in April and May as a % total annual catch in all open areas	
	April	May	April	May
2012	3%	6%	0.4%	1.2%

2013	1%	8%	0.2%	1.7%
2014	2%	9%	0.3%	2.0%
2015	29%	77%	5.4%	13.4%
2016	7%	21%	0.4%	3.5%
Grand Total	7%	17%	1.0%	3.5%

A trawl vessel could switch to dredge gear and fish with the modified gear during the AM season, but this may not be very likely for many trawl vessels, especially if the season is only for two months of the year. Therefore, this option may increase the costs due to the displacement with effort for some trawl vessels. Again, however, the net economic impacts will depend to what extent the fishing in seasons when meat weights are larger will outweigh or falls short of the costs associated with reduced flexibility due to a narrower fishing season.

7.4.4.3 Alternative 3 – Reactive Accountability Measures in Closed Area II and Extension

This reactive AM would implement accountability measures for a specified period of time that overlaps with higher bycatch rates of N. windowpane, not to exceed one (1) year. The N. windowpane accountability measures would apply to both Limited Access and General Category vessels fishing in Closed Area II Access Area and Closed Area II extension. *Rationale*: This reactive GRA would immediately follow the seasonal closure of CAII AA already in place.

This alternative includes a small AM, so that if the AM is triggered and the overage by the scallop fishery is estimated to be >0% and <20%, the AM would be in effect from November 15th – December 31st. Overall, 4 % of the Closed Area II + extension catch were landed during half of November and 6% in December as a percentage of total annual catch in those areas, adding up to 10% during both months in 2012-2914 when this area was open to fishing. The proportion of this catch in those months to total catch from access areas in the same months was higher, 23% for half of November and 51% overall in December as an average 2012-2014 fishing years (Table 23). Although those numbers suggest some effort displacement could occur to other areas or months during this GRA AM period, the economic impacts of this displacement would be low given that catch from this area was about 1% of the total annual catch from all access areas (Table 24).

Table 23. Total catch in live pounds from all species in Closed Area II +extension as a % of total annual catch from these areas (closed in 2015-2016)

Fishyear	Catch as a % of annual CA II and extension catch		Total
	Nov.15 –Nov.30	December	
2012	4%	5%	9%
2013	3%	3%	6%
2014	4%	12%	16%
Grand Total	4%	6%	10%

Table 24. Total catch in live pounds from all species in Closed Area II in April and May as a % of total annual catch from open areas

Fishyear	Catch from NWP access area as a % total catch in access areas in Nov. and Dec.		Catch from NWP access area in Nov. and Dec. as a % to annual catch in all access areas	
	Nov.15 –Nov.30	December	Nov.15 –Nov.30	December
2012	20%	45%	1%	
2013	11%	47%	1%	
2014	53%	65%	1%	
Grand Total	23%	51%	1%	

Under Sub-Option 1- Large AM, if the overage by the scallop fishery is estimated to be ≥20%, the AM would be in effect from April 1st – March 31st. The dredge modification in this alternative is expected to reduce catch, up to 10% fewer in terms of catch weights, year round form this areas under this option. Therefore, vessels may need to tow longer to attain the same amount of scallop catch, which could increase the trip costs. However, the results from this gear study demonstrated that while the modified gear caught fewer scallops, the gear is more selective at catching larger scallops and will likely reduce catches smaller scallops. In addition, given that larger scallops usually sell at a higher price, the impacts on revenues could be positive as well. Depending on the increase in trip costs and size composition of landings and prices, net revenues under this option could range from low-negative to low-positive relative to No Action.

Under Sub-Option 2: Large AM, if the AM is triggered and the overage by the scallop fishery is estimated to be ≥20%, the AM closure would be in effect from November 16th – December 31st .The closure would be a continuation of the current CAII seasonal closure in place to reduce catch of GB yellowtail flounder. If these AMs trigger, vessels will shift their effort to other areas and seasons. Therefore, those closures would result in some amount of effort displacement in the scallop fishery with relatively small economic impacts compared to the No Action especially if the overage if less than 20%. The net economic impacts of this alternative would be low positive if the beneficial impacts on the scallop yield by fishing in the seasons when meat weights are larger outweighing the costs associated with reduced flexibility due to a narrower fishing season under this option. Conversely, if the increase in fishing costs due to reduced flexibility exceeds the benefits of fishing in seasons when meat weights are larger, the net economic impacts could be low negative. Thus, the net economic impacts of Alternative 3 compared to No Action could range from low negative to low positive in the short-term, or could even be neutral. However, potentially positive impacts on the scallop yield and reduction of the risk of triggering yellowtail AMs could result in positive economic impacts over the long-term.

7.4.5 Accountability Measures for the Georges Bank Yellowtail Flounder sub-ACL to the Scallop Fishery

Accountability measures for Georges Bank yellowtail flounder are the same as the AM measures proposed for Northern (GOM/GB) Windowpane Flounder in Section 7.4.4, including No Action (Alternative 1), Alternative 2 and Alternative 3. Therefore expected economic impacts of these alternatives on the scallop fishery would be equivalent to the impacts of AMs for Northern (GOM/GB) Windowpane Flounder.

7.4.5.1 Alternative 1 – No Action, the existing GB yellowtail AM remains in place

Under No Action, there would be no accountability measure linked to the scallop fishery's N. windowpane flounder sub-ACL, thus, neutral economic impacts are expected in the short-term for the participants of the scallop fishery. If the scallop fishery exceeds its sub-ACL, no measures would be triggered to limit or reduce future catch of northern windowpane flounder in the scallop fishery.

If the overage by the scallop fishery is substantial causing the overall ACL to be exceeded, AMs would trigger for the groundfish fishery because there are currently no AMs specific to the scallop fishery. However, AM for N. windowpane is a regulatory requirement for FY2018. Therefore, No Action is not in compliance with NMFS regulation and guidance on ACL management.

7.4.5.2 Alternative 2 - Reactive Accountability Measure in Georges Bank Open Areas

This alternative would implement a gear restricted area (GRA) for a specified period of time with higher bycatch rates of N. windowpane, not to exceed one (1) year. The N. windowpane accountability measures would apply to both Limited Access and General Category vessels in open areas (Same economic impacts as discussed in Section 7.4.4.2).

7.4.5.3 Alternative 3 – Reactive Accountability Measures in Closed Area II and Extension

This alternative would implement accountability measures for a specified period of time that overlaps with higher bycatch rates of GB yellowtail, not to exceed one (1) year. The GB yellowtail accountability measures would apply to both Limited Access and General Category vessels (Same economic impacts as discussed in Section 7.4.4.3).

7.4.6 Accountability Measures for SNE/MA Yellowtail Flounder sub-ACL allocated to the Scallop Fishery (LA, LAGC dredge, LAGC trawl

7.4.6.1 Alternative 1 – No Action, The existing SNE/MA yellowtail AM remains in place

This alternative would keep the existing SNE/MA yellowtail AM in place for LA, LAGC dredge, and LAGC trawl components of the scallop fishery. Under No Action, there would be no accountability measure linked to the scallop fishery's yellowtail flounder sub-ACL, thus, neutral economic impacts are expected in the short-term for the participants of the scallop fishery.

7.4.6.2 Alternative 2 – Reactive GRA Accountability Measures for LA and LAGC

This alternative would implement a gear restricted area for a specified period of time with higher bycatch rates of SNE/MA yellowtail flounder. The AM would apply to all Limited Access and General Category vessels fishing for scallops.

Although reduced flexibility and potentially reduced landings due to fishing with modified gear will have some negative economic impacts on the scallop vessels, these impacts are expected to be low. Usually, required gear modification is expected to have minor impacts on fishing costs. If a vessel switches its gear several times a year there is labor cost involved, but the gear requirements at the beginning of the year avoids having to change gear in middle of the FY.

The gear modifications will only be applied during the month of April if the overage rate is less than 20% and in both April and May if the overage is 20% or more. Overall, an average of 16

% of the SNE/MA catch (98% scallops) were landed in April and 20% in December as a percentage of total annual catch in those areas, adding up to 36% during both months in 2012-2016 (Table 25). Therefore, implementing GRA for both April and May could displace some effort to other months if some vessels choose not to fish during these months with the modified gear

As a proportion of total catch in open areas only, SNE/MA landings were 48% in April and 40% in May of total open areas catch in those months during the fishing years from 2012 to 2016. (Table 26). However, total catch from these areas in April constituted only 7% of open area catch all year round and in May it constituted only about 8% of all open area catch year round as an average during 2012-2016 fishing years. Therefore, in general, the impacts of displacement under this alternative on annual landings are would probably be low.

The dredge modification in this alternative is expected to reduce catch, up to 10% fewer in terms of catch weights. Therefore, vessels may need to tow longer to attain the same amount of scallop catch, which could increase the trip costs. However, the results from this gear study demonstrated that while the modified gear caught fewer scallops, the gear is more selective at catching larger scallops and will likely reduce catches smaller scallops. In addition, given that larger scallops usually sell at a higher price, the impacts on revenues could be positive as well. Given that trip costs are usually a small proportion of scallop revenue, net revenues under this option could be higher relative to No Action.

Therefore, the net economic impacts of this Alternative compared to No Action could be neutral, or slightly positive depending on the relative impacts on landings and revenues. The results also depend on the expected landings from open areas relative to total landings in those months.

Table 25. Total catch in live pounds from all species in SNE/MA yellowtail area as a % of total annual catch from these areas

Fishyear	Catch as a % of SNE/MA		April+May
	April	May	
2012	18%	31%	49%
2013	12%	13%	25%
2014	25%	26%	51%
2015	27%	6%	33%
2016	3%	14%	17%
Grand Total	**16%**	**20%**	36%

Table 26. Total catch in live pounds from all species from SNE/MA yellowtail area in April and May as a % of total annual catch from open areas

	Catch from SNE/MA as a % total catch in in open areas in April and May		Catch from SNE/MA in April and May as a % total annual catch in all open areas	
Fishyear	April	May	April	May
2012	52%	48%	6%	10%
2013	24%	16%	3%	3%
2014	73%	68%	15%	15%
2015	42%	10%	8%	2%
2016	30%	47%	2%	8%
Grand Total	48%	40%	7%	8%