DRAFT

ADDITIONAL IMPACT ANALYSES FOR FRAMEWORK 26

1.1 IMPACTS OF SPECIFICATION ALTERNATIVE IDENTIFIED AS PREFERRED BY THE SCALLOP COMMITTEE

At the November 2014 AP and Committee meeting last week the preferred alternative recommendation was **Alternative 3 with Closure Option 2 and Option 3 only.**

That alternative would close the NL extension and the inshore portion of ETA in 2015, but not Option 1 (CA2 extension). The areas would remain closed until a subsequent action opens them or keeps them closed. When Option 1 remains an open area, the fishery is allocated one additional open area DAS from 30 DAS to 31 DAS, based on the level of projected catch that would come from that area if was left an open area.

This specific combination of sub-options was not one of the original seven runs completed in the FW26 document. Since the meeting the Scallop PDT has evaluated the potential biological and economic impacts of that particular specification alternative.

Overall, the impacts are very similar to Alternative 3 with 3 closures, with a few differences.

- Estimates of total biomass are slightly higher for the alternative that closes all three areas compared to the alternative that only closes NL and ETA (Figure 1).
- Limiting the new closures to two areas, NLS and ETA, will increase the open area DAS by one day and the estimated landings by 1.1 million lb. in the 2015 fishing year (Table 1 and Figure 2).
- Two closures including ETA and NLS access areas is estimated to result in about $11 million higher revenues and in over $11.4 million in higher total economic benefits compared to the three closures that includes closing CA2 in the 2015 fishing year (Table 1).
- Although the present value of the total revenues and economic benefits for these two closures would exceed the values for three closures respectively by $26.6 million and $25.6 million in 2015-2016, in the next three years from 2017 to 2019, the two closure alternative would result in $70.2 million lower revenue and in $77.2 lower economic benefits compared to the values for three closures (using a 3% discount rate, Table 2). If instead the future benefits were discounted at a higher rate, by 7%, the estimated revenues for the 3 closures would exceed the revenues for 2 closures respectively by $61 million and the total economic benefits by $67 million from 2017 to 2019 (Table 3).
- Over the long-term from 2015 to 2018, present value of the revenues for the 3 closures would exceed the benefits for 2 closures by $18 million, and economic benefits by $21.7 million using a 3% discount rate (Table 2). Although the revenues and total economic benefits for the 3 closures would still exceed the levels for 2 closures, the differences in revenues and benefits would be lower ($13.2 million for revenues and $16.4 for total

economic benefits) if instead future benefits are discounted at a higher rate by 7% (Table 3). Estimated landings by year are shown in Table 4 below from 2015 to 2028.

- The projected catch of WP is higher for the 2 closure alternative compared to the 3 closure alternative that closes the CA2 extension area (). The range of WP catch estimated to come from that area if it is left open is 5-14 mt., based on an assumption of either 200 mt of scallop catch from the area, or a high estimate of 512 mt. That area is a relatively high D/K area for WP compared to other areas, especially in the winter ().

Table 1. Short-term comparative benefits of new closures (All dollar values are expressed in 2014 inflation adjusted values)

Values	3 new closures (CA2+ETA+NLS)	2 new closures (ETA+NLS)	Difference in benefits from 3 closures
Open area DAS per FT vessel	30.0	31.0	1.0
Scallop landings (mill.lb.)	46.3	47.4	1.1
Scallop revenue ($ million)	567.1	578.1	11.0
Producer surplus ($ million)	524.7	534.8	10.1
Total economic benefits ($ million)	551.7	563.1	11.4

Table 2. Comparative benefits of new closures (All dollar values are expressed in 2014 inflation adjusted values and estimated using a 3% discount rate)

Period	3 new closures (CA2+ETA+NLS)	2 new closures (ETA+NLS)	Difference in benefits from 3 closures
	Open area DAS per FT vessel		
2015-2016	64	66	2.0
2017-2019	165	164	-1.0
2020-2028	480	481	1.0
2015-2028	**709**	**711**	**2.0**
	Scallop landings (mill.lb.)		
2015-2016	101.1	103.9	2.8
2017-2019	218.6	209.8	-8.8
2020-2028	530.1	532.9	2.8
2015-2028	**849.8**	**846.6**	**-3.2**
	Present value of scallop revenue ($ million)		
2015-2016	1191.0	1217.7	26.6
2017-2019	2196.8	2126.6	-70.2
2020-2028	4736.0	4761.6	25.6
2015-2028	**8123.9**	**8105.9**	-18.0
	Present value of producer surplus ($ million)		
2015-2016	1102.1	1126.5	24.4
2017-2019	2029.3	1965.0	-64.3
2020-2028	4381.4	4405.2	23.8
2015-2028	**7512.8**	**7496.6**	-16.2
	Present value of total economic benefits ($ million)		
2015-2016	1165.0	1192.9	27.9
2017-2019	2204.0	2126.9	-77.2
2020-2028	4676.6	4704.2	27.6
2015-2028	**8045.7**	**8024.0**	-21.7

Table 3. Comparative benefits of new closures (All dollar values are expressed in 2014 inflation adjusted values and estimated using a 7% discount rate)

Period	3 new closures (CA2+ETA+NLS)	2 new closures (ETA+NLS)	Difference in benefits from 3 closures
	Present value of scallop revenue ($ million)		
2015-2016	1167.7	1193.8	26.1
2017-2019	1962.5	1901.5	-61.0
2020-2028	3404.0	3425.7	21.7
2015-2028	6534.2	6521.0	-13.2
	Present value of producer surplus ($ million)		
2015-2016	1080.5	1104.4	23.8
2017-2019	1812.8	1756.9	-55.9
2020-2028	3149.1	3169.2	20.1
2015-2028	6042.5	6030.5	-11.9
	Present value of total economic benefits ($ million)		
2015-2016	1142.1	1169.4	27.3
2017-2019	1969.0	1901.9	-67.0
2020-2028	3361.4	3384.8	23.4
2015-2028	6472.5	6456.1	-16.4

Table 4. Estimated landings (Million lb.) (Estimated landings in 2014, 40 to 41 mill.lb.)

Period	Fishing year	3 new closures (CA2+ETA+NLS)	2 new closures (ETA+NLS)	Difference in landings from 3 closures
2015-2016	2015	46.3	47.4	1.1
	2016	54.8	56.5	1.7
2015-2016 Total		**101.1**	**103.9**	**2.8**
2017-2019	2017	73.9	73.5	-0.5
	2018	73.7	72.1	-1.6
	2019	70.9	64.2	-6.7
2017-2019 Total		**218.6**	**209.8**	**-8.8**
2020-2028	2020	60.7	60.9	0.2
	2021	59.3	60.6	1.3
	2022	58.3	60.3	1.9
	2023	57.9	59.8	1.8
	2024	58.3	59.4	1.0
	2025	59.0	58.1	-0.8
	2026	59.3	57.5	-1.8
	2027	58.8	58.0	-0.9
	2028	58.4	58.4	0.0
2020-2028 Total		**530.1**	**532.9**	**2.8**
2015-2028		**849.8**	**846.6**	**-3.2**

Figure 1 – Estimate of total biomass for several FW26 runs (Alternative 2 (base run), Alternative 3 with 3 closures and Alternative 3 with 2 closures (NL and ETA)

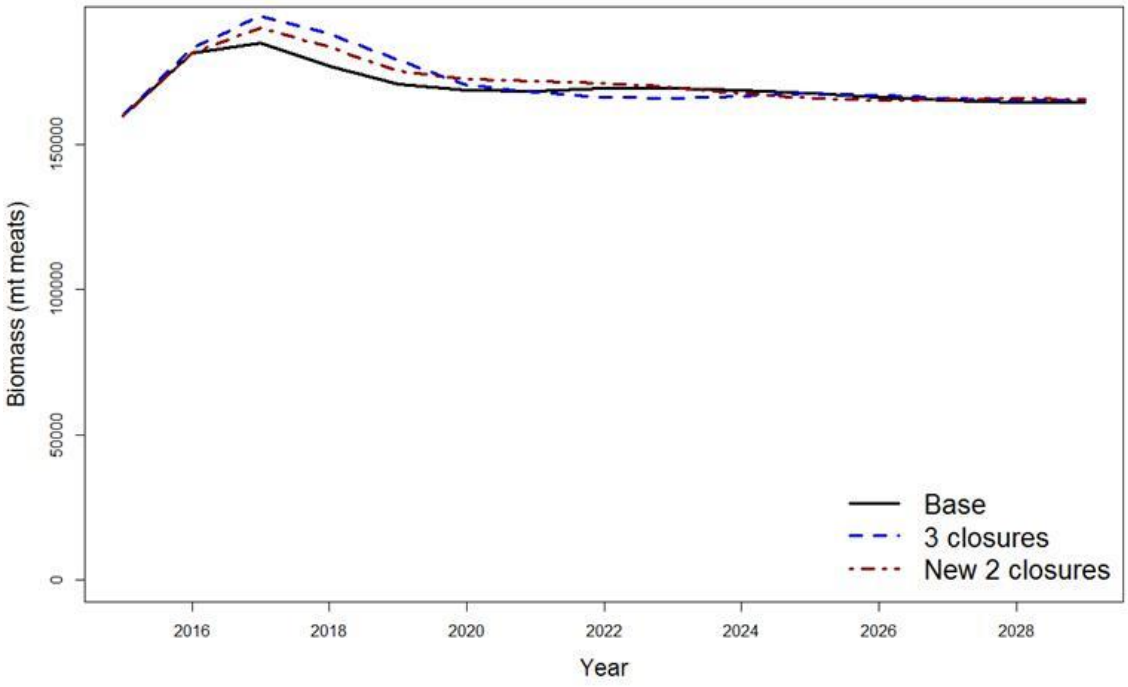


Figure 2 – Estimate of total scallop landings for several FW26 runs (Alternative 2 (base run), Alternative 3 with 3 closures and Alternative 3 with 2 closures (NL and ETA)

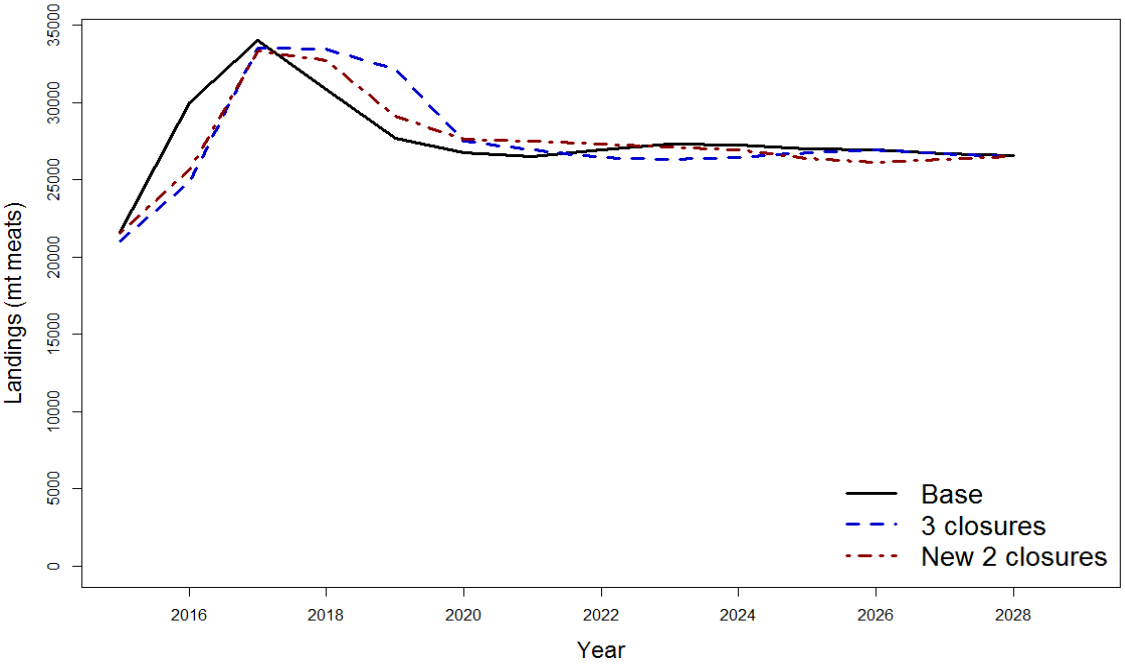


Table 5 – Projected WP catch for several FW26 specification alternatives

	CA1	CA2	C2Ext	Sch	SEP	NEP	Total
D:K 2013	0.003	0.005	0.027	0.005	0.022	0.009	
HIGH							
Alt 2 Scallop Landings	0	0	512	2386	2840	706	6444
Alt 2 WP Catch	0	0	14	11	63	6	94
Alt 3 (3 closures) Scallop Landings	0	0	0	2386	2844	706	5936
Alt 3 (3 closures) WP Catch	0	0	0	11	63	6	80
Alt 3 (NL+ETA) Scallop Landings	0	0	512	2381	2839	705	6437
Alt 3 (NL +ETA) WP Catch	0	0	14	11	63	6	94
LOW							
Alt 2 ReducedSEPLand	0	0	200	2386	1000	706	4292
Alt 2 ReducedSEP WP Catch	0	0	5	11	22	6	45
Alt 3 (3 closures)ReducedSEPLand	0	0	0	2386	1000	706	4092
Alt 3 (3 closure)ReducedSEP WP Catch	0	0	0	11	22	6	39
Alt 3 (NL+ETA)ReducedSEPLand	0	0	200	2386	1000	706	4292
Alt 3 (NL+ETA)ReducedSEP WP Catch	0	0	5	11	22	6	45

Table 6 – Projected D/K ratios by scallop management area and quarter (calendar year)

2009-2014

Quarter	CA1	CA2	C2Ext	Sch	SEP	NEP
1	0.006	0.410	0.079	0.006	0.160	0.013
2	0.002	0.004	0.002	0.003	0.004	0.004
3	0.007	0.003	0.001	0.005	0.004	0.004
4	0.024	0.007	NA	0.004	0.006	0.014

2013

Quarter	CA1	CA2	C2Ext	Sch	SEP	NEP
1	0.006	0.410	0.079	0.004	0.160	0.013
2	0.004	0.003	0.004	0.003	0.011	0.002
3	0.000	0.001	0.002	0.008	0.004	0.019
4	0.000	0.025	0.025	0.011	0.006	0.014

1.2 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

This section is a qualitative review of the possible impacts to Essential Fish Habitat that could result from adoption of alternatives included in this framework adjustment. These evaluations consider impacts to benthic habitat generally, across the EFH designations for various species (scallops, groundfish, etc.) in aggregate, rather than evaluating impacts at the level of individual EFH designations. This is consistent with the fact that there are considerable spatial overlaps between individual EFH designations in areas where the scallop fishery operates.

Implementing the various measures in this framework action may cause changes to both the magnitude and the direction of adverse effects to EFH. The magnitude of adverse effects is generally related to (1) the location of fishing effort, because habitat vulnerability is spatially heterogeneous, and (2) the amount of fishing effort, specifically the amount of seabed area swept or bottom time. To the extent that adoption of an alternative would shift fishing to more vulnerable habitats, and/or increase seabed area swept, adoption would be expected to cause negative habitat impacts. If adoption of an alternative is expected to reduce seabed area swept or cause fishing effort to shift away from more vulnerable into less vulnerable habitats, a positive habitat impact would be expected. The magnitude of these effects relates to the proportion of total scallop fishing effort that is affected by a particular alternative.

Bearing in mind that both the direction and magnitude of changes are difficult to predict, because changes in fishing behavior in response to management actions can be difficult to predict, adverse effects could shift as follows under the new ABC, ACLs, and annual specifications:

- The lower No Action specifications would have low positive impacts on EFH due to reduced effort levels, although landings would also be lower under No Action. The various alternative specifications (Alternatives 2, 3, and 4) are predicted to be similar to one another in terms of their potential impacts to EFH.
- LAGC access area allocation alternatives all have similar predicted EFH impacts.
- Crew size limits may have a slight positive impact on EFH.

Other measures related to management of the scallop fishery are not expected to have substantial positive or negative impacts on EFH relative to No Action. These include:

- Mid-Atlantic access trip allocation method: slight positive to slight negative impacts
- Allocating/monitoring access trips: generally administrative; no change in impacts expected
- Fishing in state waters after NGOM TAC reached: neutral to slightly negative impacts given state restrictions on fishing also in effect
- Turtle gear consistency measures: no change in impacts expected
- Accountability measures for northern windowpane, GB yellowtail, and SNE-MA yellowtail: no change in impacts expected
- VMS declaration measures: no change in impacts expected
- Turtle deflector dredge flaring bar provision: no change in impacts expected

Summarize impacts of preferred alternative here.

1.2.1 Overfishing limit and Annual Biological Catch

Alternative 1 - No Action for OFL and ABC

Under "No Action", the overall OFL and ABC would be equivalent to default 2015 values adopted in Framework 25.

- OFL = 34,247 mt;
- ABC=29,683 mt;
- Discards=5,701 mt;
- ABC less discards available to fishery=ACL=23,982 mt.

These levels, which are based upon updated scientific information, are lower than the alternative specifications. Thus, fishing effort and impacts to habitat are expected to be lower under No Action as compared to the alternative OFL and ABC. However, associated catch levels will also be lower.

Alternative 2 - Updated OFL and ABC for FY2015 and FY2016 (default)

The action alternative updates OFL and ABC numbers for 2015, and sets 2016 default values as well.

- For FY 2015:
  - OFL = 38,061 mt;
  - ABC= 31,459 mt;
  - Discards= 6,107 mt;
  - ABC less discards available to fishery=ACL= 25,352 mt.
- Default FY 2016:
  - OFL = 45,456 mt;
  - ABC= 37,309 mt;
  - Discards= 6,096 mt;
  - ABC less discards available to fishery=ACL= 31,807 mt.

Additional fishing effort and habitat impacts are expected under the alternative specifications because they are higher than the No Action values, i.e., negative impacts to EFH are expected relative to No Action. However, these updated values are consistent with the most recent data and are expected to be a more accurate estimation for the scallop resource, thus maintaining catch efficiency over time in the fishery. (Of greater concern would be higher catch allocations that are not supported by scallop biomass, such that landings per unit effort decline and area swept increases relative to landings.)

1.2.2 Fishery specifications

1.2.2.1 Overall fishery allocations

Specification alternatives 1-4 are compared in terms of their impacts to EFH using the projected bottom area swept values from the SAMS model simulations (see scallop resource impacts section for details). These area swept estimates are closely related to the LPUE estimates. Generally, scenarios with higher LPUE have lower area swept, and scenarios with lower LPUE have higher area swept.

Alternative 1 (No Action – Default measures from Framework 25)

In the scallop FMP, the No Action specifications are 75% of the default from the previous specifications framework, with no access area allocations. No Action specifications are 17 DAS for full-time vessels.

Under FY2015 default measures the LAGC IFQ allocation is 1,274 mt for vessels with a LAGC IFQ permit as well as LA vessels with a LAGC IFQ permit. No action for the NGOM hard TAC is 70,000 pounds and the target TAC for vessels with a LAGC Incidental permit is 50,000 pounds.

During 2015, No Action has lower allocations than the alternative specifications, and does not include access area trips. Thus, 2015 effort and area swept would be lower under this alternative, as compared to any of the action alternatives, resulting in fewer impacts to EFH during 2015. During 2016, area swept is very similar across all the alternatives. Combining these two years, No Action would have low positive impacts on EFH, but it also has the lowest projected landings of any of the alternatives.

Alternative 2 (Basic run using fishing mortality target principles with no modifications to scallop access area boundaries)

When the fishing target principles of the FMP are applied to the estimated biomass in each area for FY2015 the allocations for full-time LA vessels are:

- 31 DAS for FT vessels in open areas.
- Access area landings equivalent to 8,700 mt (19.2 million pounds), corresponding to three trips per FT LA vessels at 17,000 pounds per trip in ET, Delmarva and HC.
- The remaining scallop access areas would be closed to the scallop fishery in 2015: Closed Area I, Closed Area II, and Nantucket Lightship.
- Total projected landings for Alternative 2 from all sources of catch (including set-asides and LAGC catch) is about 45 million pounds.
- Sub-ACL for LAGC IFQ vessels is 1,348mt (about 2.97 million pounds).
- NGOM hard TAC of 70,000 pounds and the target TAC for vessels with a LAGC Incidental permit at 50,000 pounds.

Area swept estimates are discussed in the scallop resource impacts section. All of the action alternative scenarios have similar area swept estimates during fishing years 2015 and 2016, such that impacts to EFH will be similar under any of the alternatives. Alternative 2 would have negative impacts relative to No Action, but also much lower landings during 2015 for reasons discussed above. Leaving the access area boundaries as they currently exist appears to have limited influence on estimated area swept.

Alternative 3 (Basic run using fishing mortality target principles with modifications to scallop access area boundaries)

Three different closure modifications to existing access areas are under consideration in this alternative to reduce impacts on small scallops observed in various areas. One or more of these closure options could be selected. In addition to the three possible closures, the other specifications include:

- 30 DAS for FT vessels in open areas (one less than Alternative 2).
- Total projected catch for Alternative 3 varies slightly depending on the sub-options selected; overall it is about 46 million pounds (including set-asides and LAGC catch); slightly higher than Alternative 2
- Other specifications are the same as Alternative 2

Option 1 – Modification to access area in Closed Area II: Option 1 is an extension of the scallop access area in Closed Area II to include concentrations of small scallops that are near existing boundaries of current access area. If selected, vessels would be prohibited from transiting through the scallop access areas within Closed Area II.

Option 2 – Modification to access area in Nantucket Lightship: Option 2 is an extension of the scallop access area in Nantucket Lightship to include concentrations of small scallops that are near existing boundaries of current access areas. If selected, vessels would be allowed to transit through the NL scallop access area.

Option 3 – Modification to Elephant Trunk: Option 3 is different in that this option proposes to close areas *within* current scallop access areas, or temporarily prohibit fishing in a subset of a current scallop access area. If selected, vessels would be prohibited from transiting through the closure within Elephant Trunk.

SAMS model scenarios relevant to this alternative assume either two or three of the boundary changes. The two closure run reflects adjustments to CA2 and NL only (i.e. implementing Options 1 and 2 above). The three closure run (i.e. implementing Options 1, 2, and 3 above) assumes all three boundaries are adjusted. During 2015, both scenarios have very similar area swept projections, such that similar EFH impacts are expected regardless of the option or options selected. As noted in the resource impacts discussion, all of the scenarios have similar area swept estimates, and the trend over time has been for area swept projections to decrease, from about 2,800 square nautical miles in the Framework Adjustment 25 scenarios to about 2,200 square nautical miles for the scenarios relevant to this action. Therefore, while Alternative 2 with any combination of options has higher impacts than the No Action (rollover) specifications, impacts are expected to be lower than status quo fishery conditions.

Alternative 4 (Basic run using fishing mortality target principles, with reduced F in MA access areas)

The same overall principles would be used to set fishing targets for the fishery; however, the allowable fishing mortality limit used to set allocations for MA access areas would be reduced by some amount to reduce impacts on small scallops observed in those areas. For example, in the base run the fishing mortality was set at 0.35 for all three MA access areas; for this alternative it was reduced to 0.30, but there is no closure in Elephant Trunk. This reduction in fishing mortality target would translate into lower catch allowed to be removed from the access areas (possession limits reduced by about 1,000 pounds per trip). This alternative can be combined with options that close extensions of CA2 and/or NL, but this alternative does not include the ETA closure option.

Under this alternative:

- 31 DAS for FT vessels in open areas.
- Access area landings equivalent to 7,650 mt (about 16.9 million pounds), corresponding to three trips per FT LA vessels at 16,000 pounds per trip in ET, Delmarva and HC.
- Total projected catch for Alternative 4 is about 45 million pounds (including set-asides and LAGC catch).
- Other specifications are the same as Alternative 2

Area swept values and therefore projected EFH impacts associated with reductions in F in the MA access areas are very similar to the other SAMS model scenarios during 2015. In 2016, there is slightly higher area swept predicted under the reduced MA access area F scenario as compared to the scenarios which include two or three boundary changes. Again, projected habitat impacts of this alternative are very similar to the other action alternatives, with negative impacts expected relative to No Action.

1.2.2.2 Allocation of LAGC IFQ trips in access areas

These options consider how to allocate access area trips to the LAGC fishery during 2015. These trips have a 600 lb possession limit.

	Option 1 – No Action	**Option 2**	**Option 3**	**Option 4**
Allocation (pounds and/or percent)	No allocation	5.5% of the TAC per access area allocated as LAGC fishery fleetwide trips (1.05 million pounds)	Total LAGC access area allocations of 2 million pounds, which is about 10.4% of the total access area catch available in 2015	Total LAGC access area allocations of 1.2 million pounds
Trips	None	1,758 trips	3,333 trips	2,065 trips

As noted in the scallop resource impacts section, if LAGC trips are not taken in the access areas, LAGC catch is assumed to come from open areas instead. This could result in lower or higher catch efficiency relative to the access area trips, depending on the open area fished and the resource conditions there. Overall, LAGC catch in access areas is a small percentage of the overall catch and vessels tend to fish where catch rates are higher, so if they are higher in access areas most trips should be fished there, and if they are not more LAGC catch could come from open areas. This means that while the access area allocation options may increase flexibility for LAGC vessels in terms of where they can fish, impacts to habitat (and the resource) are likely to be similar for all options, including No Action.

1.2.2.3 Additional measures to reduce impacts on small scallops

Option 1 would maintain the current measure, no crew size limits when fishing in scallop access areas. Option 2 would limit crew size to seven individuals per LA vessel (five for limited access small dredge vessels). Limiting crew size could have two different influences on fishing behavior. Having additional crew could make it easier to fish in areas with smaller animals, i.e. more scallops to shuck. Crew limits could encourage vessels to fish in locations with larger

animals. The behavior probably does not have a substantial effect on fishing time or habitat impacts. However, if unlimited crew sizes lead to highgrading, where smaller animals are fished for and then discarded in favor of larger animals, this could increase fishing time and habitat impacts to catch the possession limit. Therefore, Option 2 is expected to have slight positive impacts on habitat relative to Option 1/No Action.

1.2.2.4 Allocation method for Mid-Atlantic access area trips in 2015 only

These alternatives determine how to allocate Mid-Atlantic access area trips during FY 2015. Under No Action, each full-time limited access vessel would receive 3 trips; two allocated to ETA, and the third from either HC or Delmarva. The third trip would be allocated by lottery. The action alternative proposes that vessels would declare a MA access area trip and could freely fish inside all three areas on the same trip. Under this alternative, limited access vessels would receive their total access area allocation in pounds, and that allocation could be fished in any of the MA access areas (and across multiple access areas on a single trip) up to a certain possession limit.

The impacts of this alternative on both the resource and on fish habitat are dependent on how fishing behavior adjusts in response to the flexible allocation, as well as on resource conditions, which makes the impacts difficult to predict. If the flexible action alternative allocation method encourages vessels to fish on the most concentrated scallop aggregations, then the action alternative could have positive impacts relative to No Action. Fishing on the highest concentrations of scallops would be the most efficient way to reach the possession limits, resulting in shorter fishing times and less area swept. However, if the flexible action alternative allocation scheme causes vessels to fish in areas where scallops are less dense, then fishing times could increase, increasing habitat impacts relative to No Action. This could occur if vessels choose to fish a lower density area because it is closer to port, for example, reducing fuel costs or overall trip duration.

1.2.2.5 Adjustments to provisions related to allocating and monitoring access area trips

The alternatives in this section adjust the way that access trip monitoring occurs. Under No Action, although access area allocations are allocated by trip, the allocations can be fished in other poundage increments, provided that broken trip provisions are adhered to. Because there is currently no penalty for broken access area trips, the allocations are in fact more flexible than the 'trip' language would indicate.

The action alternative streamlines the regulations to be more consistent with current industry practices. Under this alternative, vessels would be given a simple poundage allocation in an access area, instead of referring to it as a trip allocation with associated pounds per trip. If this alternative is adopted, vessels would submit a prelanding report through their VMS unit to indicate pounds caught. If a vessel is unable to land a full possession limit on a single trip, the vessel could go out and fish it on multiple trips without having to submit broken trip reports to request a compensation trip. Trading allocations between vessels would occur in increments of full possession limits, i.e. 17,000 lbs. Two options for the action alternative would either:

- Require vessels cross the VMS demarcation line and submit a preland within last 60 days of the fishing year in order to fish those pounds in the first 60 days of the following fishing year (Option 1).
- Allow for all unlanded access area pounds to be carried over without any action from vessels (Option 2). Under Option 2, a vessel would not have to actually go out in their vessel to physically break a trip by crossing the VMS demarcation line (Option 2)

Because the allocations are the same under both alternatives, and the alternative action serves mainly to simplify administration of the access area allocations, no impacts to EFH are expected to result from these alternatives.

1.2.3 Measures to allow fishing in state waters after federal NGOM TAC is reached

These alternatives could change the rules about fishing in state waters once the NGOM hard TAC is reached.

Under No Action, once the federal NGOM hard TAC is reached, all vessels with a federal scallop permit are prohibited from fishing for scallops in the NGOM, INCLUDING within state waters.

Under the first action alternative, if the federal NGOM hard TAC is reached, only those vessels that have both a federal NGOM permit and a state waters scallop permit could continue to fish. They would be restricted to state waters only and would be subject to state waters regulations.

Under the second action alternative, no changes would be made to the regulations prohibiting all vessels with a federal scallop permit to fish for scallops in state waters after the NGOM hard TAC is reached (§648.62). Instead, the regulations related to state water exemptions would be revised to allow an individual state to request a specific exemption related to fishing in state waters after the NGOM TAC is reached.

In the past, the NGOM TAC has not been limiting, but the fishery has come closer in recent years to achieving the TAC such that these alternatives may be triggered in the future. Either of the action alternatives could allow for fishing in state waters after the NGOM TAC is reached. However, fishing in state waters is subject to restrictions that would limit fishing effort and therefore EFH impacts. In Massachusetts, mobile gear commercial fishermen are subject to a daily possession limit of 200 lb. as well as gear restrictions to limit bycatch. Maine also has a daily possession limit and gear restrictions, as well as rotational management. The rotational system includes triggered closures when 30-40% of the biomass has been removed from the area. Thus, both states, particularly Maine, limit scallop fishing in state waters. This would limit any additional impacts to EFH that result from fishing in state waters under the action alternatives, such that the impacts of the action alternatives on EFH are expected to be neutral (TAC not exceeded) to slightly negative (TAC exceeded).

1.2.4 Measures to make turtle regulations consistent

Under No Action, there is a chain mat regulation as well as a turtle deflector dredge regulation. Chain mats are required between May 1 and November 30 south of 41°9.0′ N. latitude. Turtle deflector dredges are required between May 1 and October 31 west of 71° W. The deflector

dredge is required for any limited access scallop vessel using a dredge, regardless of dredge size or vessel permit category, or any LAGC IFQ scallop vessel fishing for scallops with a dredge width of 10.5 ft (3.2 m) or greater.

The action alternative would revise the turtle chain mat regulations to have a consistent boundary with the TDD requirement, and revise the TDD regulations to have a consistent season with the chin mat regulations. If approved, both gear elements would be required for the waters west of 71° W from May 1 through October 31.

Framework 23, which implemented the turtle deflector dredge requirements, notes that the gear performs similar to a standard dredge in terms of scallop catchability (Section 5.1.1.2.1 of FW23). The TDD is estimated to be slightly more efficient than the standard New Bedford dredge (about 4.3%), but the difference was not statistically significant. Thus, an adjustment to the season is not expected to influence the amount of fishing occurring or the location of fishing effort, and therefore no impacts to EFH are expected as a result of this change.

1.2.5 Measures to develop new accountability measures for northern windowpane flounder and modify existing accountability measures for GB and SNE/MA yellowtail flounder

1.2.5.1 Northern windowpane flounder

No Action

Under No Action, the sub-ACL for northern windowpane flounder would not have accountability measures specific to the scallop fishery. If the scallop fishery exceeds their sub-ACL, no measures would be triggered to limit or reduce future windowpane catch in the scallop fishery.

Seasonal gear restricted area (reactive AM)

To be completed – may be removed.

Modify the restriction on the number of rings in apron of dredge (proactive northern windowpane AM)

Currently all scallop dredges are required to have a MINIMUM of seven rows of rings in the apron of the dredge in all areas east of 71° W. Framework 25 modified this outdated regulation for all waters west of 71° W, excluding Mid-Atlantic access areas, as a proactive AM for southern windowpane flounder. This alternative would require all vessels to have a MAXIMUM of seven rows of rings in the apron of the dredge in all open areas and access areas, all year long. The combination of a shorter apron and lower hanging ratio has been shown to be more selective for larger scallops. This alternative would have neutral impacts on EFH as this gear modification is related to the top of the dredge, which does not come into contact with the seafloor.

Eliminate the restriction on the number of rings in apron of dredge (proactive northern windowpane AM)

This alternative would eliminate entirely the regulation on number of rings in the apron of the dredge. This alternative would allow vessels currently fishing with seven rows of rings (the

minimum requirement) to use fewer rows of rings if desired. If vessels are using more than seven rows of rings, they could continue to do so. This alternative would have neutral impacts on EFH as this gear modification is related to the top of the dredge, which does not come into contact with the seafloor.

1.2.5.2 Modify GB and SNE/MA yellowtail flounder AMs

No Action

The existing yellowtail flounder AMs include a series of seasonal closure alternatives based on which component of the scallop fishery caused the overage. There are three different YT AMs in the scallop fishery:

1) one for the LA fleet;
2) one for LAGC IFQ dredge fishery; and
3) one for LAGC IFQ trawl fishery.

The LA fishery has AMs for both GB and SNE/MA YT, but the LAGC IFQ fisheries only have AMs for SNE/MA YT since their catch of GB YT is minimal.

Reactive AM for GB YT – Seasonal gear restricted area

To be completed – may be removed

Modify the restriction on the number of rings in apron of dredge (proactive GB YT AM)

See above. This alternative would have neutral impacts on EFH as this gear modification is related to the top of the dredge, which does not come into contact with the seafloor.

Eliminate the restriction on the number of rings in apron of dredge (proactive GB YT AM)

See above. This alternative would have neutral impacts on EFH as this gear modification is related to the top of the dredge, which does not come into contact with the seafloor.

Reactive AM for SNE/MA yellowtail flounder – Seasonal gear restricted area

To be completed – may be removed

Modify the restriction on the number of rings in apron of dredge (proactive SNE/MA YT AM)

See above. This alternative would have neutral impacts on EFH as this gear modification is related to the top of the dredge, which does not come into contact with the seafloor.

Eliminate the restriction on the number of rings in apron of dredge (proactive SNE/MA YT AM)

See above. This alternative would have neutral impacts on EFH as this gear modification is related to the top of the dredge, which does not come into contact with the seafloor.

1.2.6 Measures to allow a limited access vessel to declare out of fishery on return to homeport

No Action

Limited access scallop vessels on an open area DAS trip are charged DAS from the time a vessel positions seaward of the VMS demarcation line until it once again positions shoreward of the demarcation line.

Implement a separate VMS declaration code for steaming back to port

Limited access vessels could finish their open area scallop trip by going inside the demarcation line, ending their scallop DAS trip, and declaring out of the fishery. Once declared out, vessels could go outside of the demarcation line to travel back to port so long as they are in compliance with several requirements to help enforce that vessels are not fishing while under this declaration. If this alternative is adopted an adjustment will be made to DAS allocations. Because DAS allocations would be adjusted, it is expected that this alternative would be implemented in such a way to be conservation neutral. Therefore, neutral impacts to EFH are expected.

Implement a separate VMS declaration code for steaming back to port <u>south of Cape May only</u>

This alternative is similar to the previous one, except it would only apply to vessels that intend to land scallops south of Cape May. A vessel would be prohibited from declaring out of the fishery in Cape May, and then transiting to a port north of that area. If this alternative is adopted an adjustment will be made to DAS allocations. Because DAS allocations would be adjusted, it is expected that this alternative would be implemented in such a way to be conservation neutral. Therefore, neutral impacts to EFH are expected.

1.2.7 Modify regulations related to flaring bar provision for turtle deflector dredge

Under No Action, no change would be made to the flaring bar regulations. The action alternative would slightly revise the description of the "flaring bar" within the turtle deflector dredge regulations so that it is not limited to being attached in one place only. This revision is not expected to influence the impacts of the turtle deflector dredge on the seabed, so expected impacts of the action alternative are neutral, relative to No Action.

1.3 PROTECTED RESOURCES

1.3.1 Overfishing limit and Annual Biological Catch

Alternative 1 - No Action for OFL and ABC

Under "No Action", the overall OFL and ABC would be equivalent to default 2015 values adopted in Framework 25.

- OFL = 34,247 mt;
- ABC=29,683 mt;
- Discards=5,701 mt;

- ABC less discards available to fishery=ACL=23,982 mt.

These levels, which are based upon updated scientific information, are lower than the alternative specifications. Thus, fishing effort and impacts to habitat are expected to be lower under No Action as compared to the alternative OFL and ABC. However, associated catch levels will also be lower.

Alternative 2 - Updated OFL and ABC for FY2015 and FY2016 (default)

The action alternative updates OFL and ABC numbers for 2015, and sets 2016 default values as well.

- For FY 2015:
  - OFL = 38,061 mt;
  - ABC= 31,459 mt;
  - Discards= 6,107 mt;
  - ABC less discards available to fishery=ACL= 25,352 mt.
- Default FY 2016:
  - OFL = 45,456 mt;
  - ABC= 37,309 mt;
  - Discards= 6,096 mt;
  - ABC less discards available to fishery=ACL= 31,807 mt.

Additional fishing effort and potential impacts on protected resources are expected under the alternative specifications because they are higher than the No Action values, i.e., potential negative impacts to PR are expected relative to No Action. However, these updated values are consistent with the most recent data and are expected to be a more accurate estimation for the scallop resource, thus maintaining catch efficiency over time in the fishery.

1.3.2 Fishery specifications

1.3.2.1 Overall fishery allocations

Specification alternatives 1-4 are compared in terms of their impacts to PR using the projected bottom area swept values from the SAMS model simulations (see scallop resource impacts section for details). These area swept estimates are closely related to the LPUE estimates. Generally, scenarios with higher LPUE have lower area swept, and scenarios with lower LPUE have higher area swept. In terms of impacts on turtles, the issue is whether effort in the Mid-Atlantic during the time of year when turtles are present is expected to increase or not.

Alternative 1 (No Action – Default measures from Framework 25)

In the scallop FMP, the No Action specifications are 75% of the default from the previous specifications framework, with no access area allocations. No Action specifications are 17 DAS for full-time vessels.

Under FY2015 default measures the LAGC IFQ allocation is 1,274 mt for vessels with a LAGC IFQ permit as well as LA vessels with a LAGC IFQ permit. No action for the NGOM hard TAC is 70,000 pounds and the target TAC for vessels with a LAGC Incidental permit is 50,000 pounds.

During 2015, No Action has lower allocations than the alternative specifications, and does not include access area trips. Thus, 2015 effort and area swept would be lower under this alternative, as compared to any of the action alternatives, resulting in fewer potential impacts on PR during 2015. During 2016, area swept is very similar across all the alternatives. Combining these two years, No Action would have low positive impacts on PR, but it also has the lowest projected landings of any of the alternatives.

Alternatives 2 - 4

Area swept estimates are discussed in the scallop resource impacts section. All of the action alternative scenarios have similar area swept estimates during fishing years 2015 and 2016, such that impacts to protected resources will be similar under any of the alternatives. Alternative 2 would have negative impacts relative to No Action, but also much lower landings during 2015 for reasons discussed above. Leaving the access area boundaries as they currently exist appears to have limited influence on estimated area swept and expected impacts on protected resoruces.

1.3.2.2 Allocation of LAGC IFQ trips in access areas

These options consider how to allocate access area trips to the LAGC fishery during 2015. The options that allocate more access in MA access areas could increase effort in that area if vessels from ports farther north decide to fish those areas instead of open areas farther north. This could have negative impacts on PR compared to alternaitves that allocate less potential access in MA access areas. However, there is an overall limit with all the alternatives, and vessels have individual limits as well. The overall difference between tehse alterantives is not expected to have a measurable impact on PR even if all trips are taken by vessels that do not normally fish in the MA since the difference in overall catch is about 1,600 trips or less than 1 million pounds. All LAGC vessels would dredge gear over 10.5 ft would be required to fish with a TDD and turtle chain mat, which should minimize impacts on sea turtles that come into contact with the gear.

As noted in the scallop resource impacts section, if LAGC trips are not taken in the access areas, LAGC catch is assumed to come from open areas instead. This could result in lower or higher catch efficiency relative to the access area trips, depending on the open area fished and the resource conditions there. Overall, LAGC catch in access areas is a small percentage of the overall catch and vessels tend to fish where catch rates are higher, so if they are higher in access areas most trips should be fished there, and if they are not more LAGC catch could come from open areas. This means that while the access area allocation options may increase flexibility for LAGC vessels in terms of where they can fish, impacts to protected resources (and the resource) are likely to be similar for all options, including No Action.

1.3.3 Measures to make turtle regulations consistent

Under No Action, there is a chain mat regulation as well as a turtle deflector dredge regulation. Chain mats are required between May 1 and November 30 south of 41°9.0′ N. latitude. Turtle deflector dredges are required between May 1 and October 31 west of 71° W. The deflector dredge is required for any limited access scallop vessel using a dredge, regardless of dredge size or vessel permit category, or any LAGC IFQ scallop vessel fishing for scallops with a dredge width of 10.5 ft (3.2 m) or greater.

The action alternative would revise the turtle chain mat regulations to have a consistent boundary with the TDD requirement, and revise the TDD regulations to have a consistent season with the chin mat regulations. If approved, both gear elements would be required for the waters west of 71° W from May 1 through October 31.

Framework 23, which implemented the turtle deflector dredge requirements, notes that the gear performs similar to a standard dredge in terms of scallop catchability (Section 5.1.1.2.1 of FW23). The TDD is estimated to be slightly more efficient than the standard New Bedford dredge (about 4.3%), but the difference was not statistically significant. Thus, an adjustment to the season is not expected to influence the amount of fishing occurring or the location of fishing effort, and therefore no impacts to protected resources are expected as a result of this change. Overall, this alternative is expected to have neutral benefits on protected resources. Any reduction in the size of the area that chain mats would be required is balanced by an extension of the season that TDD would be required (month of November). Used together, chain mats and TDDs are thought to increase the conservation benefit to turtles, because chain mats help reduce the impact to turtles from interactions occurring in the water column and the TDD helps reduce the impact to turtles from interacting with the dredge frame on the bottom.

1.4 NON-TARGET SPECIES

1.4.1 Specifications

Specification alternatives 1-6 are primarily compared in terms of their impacts to non-target species and other fisheries using several sources of information: 1) the projected bottom area swept values from the SAMS model simulations (Section ??); and 2) projected catch estimates; and 3) general input from the Groundfish Plan Development Team.

The area swept estimates are closely related to the LPUE estimates. Generally, scenarios with higher LPUE have lower area swept, and scenarios with lower LPUE have higher area swept. The Scallop PDT also estimated the projected catch of the three sub-ACLs allocated to the scallop fishery: GB yellowtail flounder, SNE/MA yellowtail flounder, and SNE/MA windowpane flounder. Section ??? summarizes the methods used and projected catch values for all the specification alternatives. Bycatch projections are complex because they combine not only projections of future scallop biomass, but also projections of biomass for bycatch species, bycatch rates, and assumptions of future fishing behavior in terms of spatial and temporal fishing patterns. In the past, final bycatch from the scallop fishery has been lower than projected catches for most species, but that may not always be the case. Therefore, the projected bycatch estimates are helpful for providing a potential catch estimate, but these estimates should primarily be used to provide a way to compare the potential impacts of these scenarios on bycatch of key groundfish species, and not considered a precise prediction of actual bycatch in a future fishing year.

Area swept

All FW26 specification alternatives have lower total bottom contact time compared to recent levels; the fishery was estimated to be around 5,000 square nautical miles in 2010 and about 4,000 in 2013. The range of estimated area swept for FY2015 for the specification alternatives

under consideration is about 2,200 square nautical miles (Figure ??). The less area covered by the fishery, the lower the potential bycatch and associated impacts on non-target species.

Projected catch of YT and WP

The Scallop PDT estimated the scallop fishery's projected catches of four groundfish stocks and compared these projections to the respective sub-ACLs allocated to the scallop fishery (Table 78). *Still completing projections for three stocks.*

Annual D/K for N WP

Year	D/K
2010	0.005
2011	0.005
2012	0.004
2013	0.008
2014	0.014

D/K for N. WP

2009-2014

Quarter	CA1	CA2	C2Ext	Sch	SEP	NEP
1	0.006	0.410	0.079	0.006	0.160	0.013
2	0.002	0.004	0.002	0.003	0.004	0.004
3	0.007	0.003	0.001	0.005	0.004	0.004
4	0.024	0.007	NA	0.004	0.006	0.014

2013

Quarter	CA1	CA2	C2Ext	Sch	SEP	NEP
1	0.006	0.410	0.079	0.004	0.160	0.013
2	0.004	0.003	0.004	0.003	0.011	0.002
3	0.000	0.001	0.002	0.008	0.004	0.019
4	0.000	0.025	0.025	0.011	0.006	0.014

Projected scallop and N. WP catch by area for several FW26 runs

	CA1	CA2	C2Ext	Sch	SEP	NEP	Total
D:K 2013	0.003	0.005	0.027	0.005	0.022	0.009	
HIGH							
Alt 2 Scallop Landings	0	0	512	2386	2840	706	6444
Alt 2 WP Catch	0	0	14	11	63	6	94
Alt 3 (3 closures) Scallop Landings	0	0	0	2386	2844	706	5936
Alt 3 (3 closures) WP Catch	0	0	0	11	63	6	80
Alt 3 (NL+ETA) Scallop Landings	0	0	512	2381	2839	705	6437
Alt 3 (NL +ETA) WP Catch	0	0	14	11	63	6	94
LOW							
Alt 2 ReducedSEPLand	0	0	200	2386	1000	706	4292
Alt 2 ReducedSEP WP Catch	0	0	5	11	22	6	45
Alt 3 (3 closures)ReducedSEPLand	0	0	0	2386	1000	706	4092
Alt 3 (3 closure)ReducedSEP WP Catch	0	0	0	11	22	6	39
Alt 3 (NL+ETA)ReducedSEPLand	0	0	200	2386	1000	706	4292
Alt 3 (NL+ETA)ReducedSEP WP Catch	0	0	5	11	22	6	45

1.4.2 Accountability measures

No Action

Not having an AM could ultimately have negative impacts on non-target species, especially SNE/MA windowpane flounder. The scallop fishery may have less incentive to stay under their sub-ACL without an AM in place. The MSA requires that AMs be implemented for any ACL; therefore, if this action does not include an AM for the scallop fishery, then one would likely be developed in a future action under the Groundfish FMP.

Proactive AMs

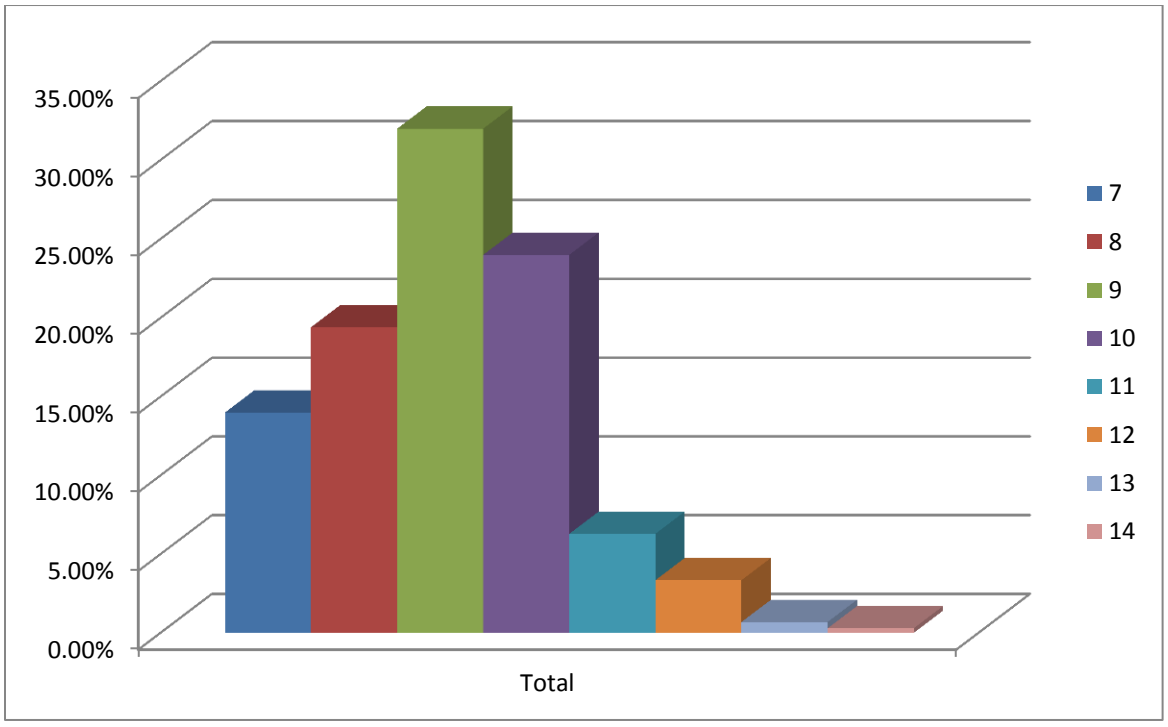
The potential beneficial impacts from this gear modification are influenced by how much of a change vessels would need to make to current gear to comply with this gear modification. To evaluate this aspect, the Scallop PDT reviewed gear specifications that are recorded on all observed scallop trips. When an observer is deployed on a vessel, it records detailed information about the gear being fished including the height of the apron in the dredge as well as the hanging ratio. The tables and figures below describe the number of observed vessels by apron height and hanging ratio. Some of these trips are from GB and scallop access areas, which would not be impacted by this AM, and this is only a subset of scallop vessels and may not represent the entire fishery. However, hundreds of LA and LAGC vessels are observed each year, so this summary is likely representative of the fishery overall.

Table 7 and **Figure 3** summarize the number of rows in all scallop dredges observed by year. The most common configuration includes nine rows of rings, followed by ten and eight. There are some vessels using seven, but the majority of the fleet seems to be using longer aprons. The number of vessels already using five rows is very small, five out of 600 observed vessels in 2013. Therefore, if this AM is implemented the majority of the fleet would need to reduce their aprons.

Table 7 – Number of rows in apron on observed scallop trips by year

No. of Rows in Apron	2008	2009	2010	2011	2012	2013	Grand Total
4	21	11	13	2	0	0	47
5	14	6	6	0	0	5	31
6	21	23	3	4	1	5	57
7	139	128	105	90	93	67	622
8	243	277	153	217	189	129	1208
9	352	403	298	226	412	184	1875
10	239	256	150	198	251	158	1252
11	72	55	29	72	47	28	303
12	45	18	33	38	30	19	183
13	12	19	15	6	16	5	73
14	1	4	2	9	2	0	18
Grand Total	1159	1200	807	862	1041	600	5669

Figure 3 – Distribution of the number of rows in LA scallop vessels from all observed records between 2008-2013



If adopted, this alternative would be effective as soon as FW26 is implemented, and is not based on an overage of a sub-ACL. All dredge vessels would be prohibited to fish with more than seven rows of rings in the apron of their dredge in all waters, open and access areas. Currently

the regulations require that all dredges greater than 8 feet have at least seven rows of rings in the apron of the dredge. A larger twine top reduces bycatch of finfish and small scallops.

This proactive gear modification may reduce bycatch of non-target species for vessels that fish with more than seven rows in the apron of their dredge within the AM area. Based on the results from observer data, the vast majority of the scallop fishery currently fishes with more than seven rows in the apron of their dredge (Table 7 and Figure 3). When the Scallop Advisory Panel discussed this issue, they estimated that most vessels fish around eight rows in the apron of a dredge, and the range in the industry is probably 7-13 rows. Therefore, if this measure is adopted, a reduction in flatfish bycatch can be expected since most of the fishery is fishing with longer aprons and would need to reduce the height of their apron.

Direct field tests of dredges with different apron heights were compared in a 2011 RSA project titled, "*Optimizing the Georges Bank Scallop Fishery by Maximizing Meat Yield and Minimizing Bycatch*"." Fourteen research trips were conducted in both Closed Area I and II from October 2010 through April 2012. Seasonal variations in scallop meat weights and YT flounder bycatch rates were evaluated. The final report from this research was included as Appendix IV to Framework 24. Based on the 14 vessels that participated in that study, most fished with 7 or 8 rows, and 3 fished with more than 10 rows. This research projects supports that shorter aprons improve fish escapement.

Table 8 from the final report shows bycatch rates of YT from trips grouped by apron height. The same standard "turtle" dredge was towed on one side of the vessel with an 8 row apron on all trips, and the other New Bedford style dredge towed on the other side varied by vessel. Most of the vessels in this experiment fished with an 8 or 7 row apron, and three (the top group) fished with 10 or 13 rows of rings in their apron. When these vessels are separated by group and compared to the turtle dredge, the overall YT bycatch rate is substantially higher for the dredges with higher aprons (0.035 for the turtle dredge with 8 rows and 0.051 for the vessels with higher aprons). About 100 tows were completed on each trip.

Table 8 - Bycatch rates for the selected stations inside CAI and CAII combined with the trips grouped by apron height (larger apron sizes tested are 10 and 13 rows versus smaller aprons of 7 and 8 rows).

			Yellowtail (lbs)		Scallops (lbs)		Bycatch Rate	
All stations	**Twine Top Size**	**Apron Size**	**Turtle**	**New Bedford**	**Turtle**	**New Bedford**	**Turtle**	**New Bedford**
Arcturus (Mar)	8.5 x 90	10 x 40	249	477	7360	8495	0.034	0.056
Westport (May)	8.5 x 80	13 x 40	182	260	9798	9757	0.019	0.027
Wisdom (Jan)	11 x 90	10 x 38	334	432	4617	4543	0.072	0.095
Total			765	1170	21775	22796	**0.035**	**0.051**
Celtic 2010 (Oct)	7.5 x 60	8 x 40	619	538	7575	6666	0.082	0.081
Celtic 2011 (Apr)	7.5 x 60	8 x 40	224	282	7078	7777	0.032	0.036
Liberty (June)	8.5 x 90	7 x 38	231	215	15517	12087	0.015	0.018
Endeavour (July)	8.5 x 80	8 x 40	222	270	9836	9185	0.023	0.029
Regulus (Aug)	7.5 x 43	8 x 38	544	514	6179	5565	0.088	0.092
Resolution (Sept)	10.5 x 36	8 x 42	637	400	5456	5638	0.117	0.071
Ranger (Oct)	9 x 33	7 x 38	763	372	6085	5491	0.125	0.068
Horizon (Dec)	8 x 96	8 x 44	445	336	4501	4338	0.099	0.077
Venture (Feb)	7.5 x 80	7 x 36	332	201	4288	3102	0.077	0.065
Regulus (March)	7.5 x 43	8 x 38	304	360	4040	4166	0.075	0.086
Endeavour (April)	8.5 x 80	8 x 40	446	366	5205		0.086	
Total			4765	3854	75760	64015	**0.063**	**0.060**
Turtle Dredge	8 x 40							

Source: Coonamessett Farm Foundation et al, 2011 RSA Final Report, *Optimizing the Georges Bank Scallop Fishery by Maximizing Meat Yield and Minimizing Bycatch*, August 2012

Overall, using YT flounder as an example, this alternative would likely be positive for non-target species compared to No Action since some vessels that fish in the AM area with a dredge apron over 7 rows will need to reduce the height of their apron if this measure is adopted.

1.5 SOCIAL IMPACTS

The consideration of the social 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)). Social science analysis is required by multiple sections of the MSA. Section 303(b)(6) on limited entry requires examination of "(A) present participation in the fishery, (B) historical fishing practices in, and dependence on, the fishery, (C) the economics of the fishery, (D) the capability of fishing vessels used in the fishery to engage in other fisheries, (E) the cultural and social framework relevant to the fishery and any affected fishing communities, and (F) any other relevant considerations." Section 303A provides guidelines for implementing social and economic components of Limited Access Privilege Programs (LAPPs). Section 303(a)(9) on preparation of Fishery Impact Statements notes they "shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on--(A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants."

Finally, National Standard 8 stipulates that "conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851 *et seq*.). A fishing community is then defined as being "substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. § 1802 (17)).

The need to measure, understand and mitigate the social impacts of fisheries policy is an essential part of the management process. Managers have an obligation to consider how policy changes affect the human context of the fishery, including the direct and indirect impacts on the safety, wellbeing, quality of life, fishery dependence, culture and social structure of communities. These impacts can be felt at the individual, family and community level which can make measuring and considering them difficult as the impact variables are typically differentially distributed. There is general consensus however, as to the types of impact to be considered; the section of the human environment where the impacts may be felt; likely social impacts; and the steps to enhance positive impacts while mitigating negative ones (ICPGSIA, 2003).

Broadly defined, social impacts that need to be considered are the "social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs, and generally cope as members of society" (Burdge and Vanclay 1995). Identifying possible social impact variables is a topic of much debate but the development of standard definitions for a set of the most common

and consequential social impacts are underway. The current National Marine Fisheries Service "Guidelines for Social Impact Assessment," provides some assistance in defining relevant social factors/variables. It is suggested that the following five social factors/variables should be considered when comparing the preferred management alternative to the alternatives not selected:

1. The *Size and Demographic Characteristics* of the fishery-related work force residing in the area; these determine demographic, income, and employment effects in relation to the work force as a whole, by community and region.
2. The *Attitudes, Beliefs and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding behavior of fishermen on the fishing grounds and in their communities.
3. The effects of proposed actions on *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities.
4. The *Non-Economic Social Aspects* of the proposed action or policy; these include lifestyle issues, health and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation* in the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution and rights. (NMFS, 2007)

Longitudinal data describing these social factors region-wide and in comparable terms is limited; though the new cost and crew surveys currently being implemented by the NEFSC will begin to alleviate this. For this framework the "guidelines" document provides a range of variables to consider when predicting potential social impacts. It should also be noted that the academic literature on the subject has provided multiple lists of potential social variables, but it also cautions that such lists should not be considered "exhaustive" or "a checklist" (ICGPSIA, 1994; Vanclay, 2002; Burdge, 2004). Ultimately judgment must be used in choosing which variables are salient in any particular case.

Yet another source of information regarding potential social factors specific to fishing communities in the Northeast can be gleaned from a series of ten "social impact informational meetings" sponsored by the NEFMC during the preparation of Amendment 13 to the (NE) Multispecies FMP. Based on comments provided by local stakeholders during these meetings five social impact factors were developed to describe the level of impact felt by fishing communities and families because of management changes: 1) regulatory discarding; 2) safety; 3) disruption in daily living; 4) changes in occupational opportunities and community infrastructure; and 5) formation of attitudes. These factors, while initially developed for the multispecies fishery, overlap with those variables suggested by NMFS guidelines and have the added benefit of reflecting specific concerns of fishermen in the Northeast.

In the preparation of this document, qualitative and quantitative methods have been used to assess the relative impact of the proposed management measures. Ports most closely involved with the scallop fishery, and likely to be affected by the proposed measures, have been identified in this and in previous scallop SAFE reports. While some management measures tend to produce certain types of social impacts it is not always possible to predict precise effects when there are

multiple overlaying management measures such as in this proposed action. Also changes to the human environment often occur in small, incremental amounts and the character of a particular impact can be hidden by the gradual nature with which it occurs. Such impacts will be noted where they are possible to discern or where the potential for cumulative impacts seems likely. Therefore the discussion of social impacts for alternatives will indicate the likely directional impacts of specific measures e.g., positive, negative, or neutral.

1.5.1 Overfishing limit and ABC

There are relatively new requirements to set annual catch limits (ACLs) and accountability measures (AMs). Acceptable Biological Catch (ABC) is defined as the maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. The Science and Statistical Committee (SSC) is responsible for setting ABC.

The current default ABC for is 23,982 mt, after accounting for discards, which is lower than the ABCs recommended by the SSC for this action, however the difference is not great enough to cause significant impacts . If Alternative 1 (no action) is adopted there will likely be no significant negative social impacts in the near-term felt by the individuals and communities involved in the scallop fishery. However, long-term sustained catches that significantly fall below the recommended ABC could translate into negative social impacts threatening the *Historical Dependence on and Participation* in the fishery. It is also possible that the adoption of the default ABC could have a small but negative impact on the formation of *Attitudes and Beliefs* regarding government and management because these ABCs would not be based on the best available science.

Compared to Alternative 1, the No Action alternative, the ABCs set by Alternative 2 are higher and would increase catches of scallops for the years specified. If Alternative 2 is adopted a near-term, positive but small impact (compared to no action) should be expected on the *Size and Demographic Characteristics* of the fishery-related work force as increased catch and revenue would affect income, and employment opportunities. Therefore, the long-term effects of adopting Alternative 2 would likely have a small but positive impact on both the *Size and Demographic Characteristics* of and the *Historical Dependence on and Participation* in the fishery. It is also possible that the adoption of new ABCs based on the best available science, could have a small but positive impact on the formation of *Attitudes and Beliefs* regarding management and government.

1.5.2 Fishery specifications

1.5.2.1 Overall fishery allocations

If Alternative 1 (no action) is adopted there will likely be negative social impacts felt by the individuals and communities involved in the scallop fishery in the near-term, especially regarding the *Size and Demographic Characteristics* of the fishery-related work force and *Historical Dependence on and Participation* in the fishery, as reduced catch and revenue and no access area allocations, as compared to other alternatives, would affect income and employment opportunities. The reduced sense of security in an individual's future planning of fishery operations would also have a negative effect on the *Lifestyle/Noneconomic social aspects* of the fishery.

Alternatives 2-4 all provide higher economic benefits in the near-term (see Economic Impacts section), thus they would likely (to differing degrees) positive affect related social impacts as the overall *Size and Demographic Characteristics* in the fishery, compared with the No Action alternative. Alternatives 2 and 4 contain the same number of allocated open access days and similar total projected landings, but Alternative 4 has slightly reduced access trip allocations in the Mid-Atlantic, which may have greater impact on less mobile fishermen whose fishing grounds are in this region. Alternative 3 has one less open access days in exchange for higher total projected landings; alternative 3 with three closures has the highest revenues and total economic benefits over the long-term (see Economic Impacts), and thus would have the most positive social impacts on *Historical Dependence on and Participation* in the fishery. Alternative 3 with three closures would also have a greater probability of positively affecting *Size and Demographic Characteristics* in the long-term, but at the risk of slightly reducing operational flexibility (from access area modifications), thus slightly impacting negatively the *Life-style/Non-economic social aspects* of the fishery, especially for those fishermen less mobile or whose preferred fishing grounds are affected.

1.5.2.2 Allocation of LAGC IFQ trips in access areas

The LAGC IFQ fishery is allocated a fleetwide total number of access area trips. Individual vessels are not required to take trips in specific areas like access area trips allocated to the limited access fishery. Instead, a maximum number of trips is identified for each area and once that limit is reached, the area closes to all LAGC IFQ vessels for the remainder of the fishing year.

If Option 1 (no action) is adopted there will likely be negative social impacts felt by the individuals and communities involved in the LAGC-IFQ scallop fishery in the near-term, especially regarding the *Size and Demographic Characteristics* of the fishery-related work force and *Historical Dependence on and Participation* in the fishery, as no access area trips, as compared to other options, would affect income and employment opportunities. The reduced sense of security in an individual's future planning of fishery operations would also have a negative effect on the *Lifestyle/Noneconomic social aspects* of the fishery.

Options 2-4 all provide the opportunity for increased landings and higher income and employment opportunities, thus they would likely (to differing degrees) positive affect related social impacts as the overall *Size and Demographic Characteristics* and *Historical Dependence on and Participation* in the fishery, compared with the No Action, but option 3 has the potential for the highest positive economic impact, and thus the highest social impacts that are positively affected by revenue and employment, such as individual and community participation in the fishery.

1.5.2.3 Additional measures to reduce impacts on small scallops

Option 1 would likely have no short-term social impacts on the scallop fishery, though if the lack of crew limits does have an anticipated effect on small scallops, it could have long-term negative impacts on the resource biomass, thus negatively impacting the *Size and Demographic Characteristics* and *Historical Dependence on and Participation* in the scallop fishery in the future. Option 2 would likely stem the potential of such long-term negative impacts on resource

biomass from increased crew effort. However, option 2 could have social impacts on the *Size and Demographic Characteristics* of the fishery-related work force, in that crew limits would favor the hiring of more experienced crew, thus impacting not only income distribution among potential crew but also the training of new or younger fishermen.

1.5.2.4 Allocation method for Mid-Atlantic access areas trips in 2015

The option to allow a flexible allocation of access trips in the Mid-Atlantic would likely have short-term positive social impacts on the *Historical Dependence on and Participation* in the fishery, in that it could enhance the flexibility to fish in areas with higher concentrations of scallops or that may be preferable for other reasons. Such flexibility may also enhance the *Non-Economic Social Aspects*, if it is less likely to interrupt traditional fishing patterns. However, given the long-term impacts on the biomass and the economics of the fishery are unclear, likewise social impacts from the *Size and Demographic Characteristics* of the fishery to the *Historical Dependence on and Participation* in the fishery are also uncertain.

1.5.2.4.1 Adjustments to provisions related to allocating and monitoring access area trips

The option to remove the current broken trip process would likely have slightly positive social impacts on the *Non-Economic Social Aspects* in the fishery, in that it could enhance the flexibility to fish in access areas without the potential burden of reporting requirements should a broken trip arise, although potentially replacing with other reports. Such flexibility comes at the cost of agency ability to monitor fishing activity more precisely, with potentially negative long-term impacts on the biomass; likewise social impacts from the *Size and Demographic Characteristics* of the fishery to the *Historical Dependence on and Participation* in the fishery are also uncertain.

1.5.3 Measures to allow fishing in state waters after federal ngom tac is reached

Alternatives 2 and 3, compared to no action, would have positive social impacts on scallop fishermen eligible to fish in the scallop fisheries in state waters. With little expected impact on biomass, there would likely be no long-term negative effects on biomass-related social impacts, but there would be positive impacts on the *Attitudes, Beliefs and Values* of fishermen, given these alternatives would allow permitted fishermen to continue having access to fishing grounds they may feel they have rights to fish in. Alternative 3 has the potential to include more scallop fishermen and thus may have more positive impact on The *Size and Demographic Characteristics* of the fishery-related work force, though its impact on the fishermen in the state waters only fishery is unknown.

1.5.4 measures to make turtle regulations consistent

Since both of the alternatives under consideration are expected to neither impact the resource nor change fishing behavior in any significant way since there are only slight modifications to the area and season affected, no social impacts of any significance on fishermen are to be expected. Reducing regulatory complexity through adopting alternative 2, however, may have slightly positive impact on the *Attitudes, Beliefs and Values* of anyone involved in the fishery.

1.5.5 measures to develop New Accountability measures for northern windowpane flounder and modify existing accountability measures for gb and sne/ma yellowtail flounder

N. Windowpane

If Alternative 1 (no action) is adopted there will likely be no near-term social impacts felt by the individuals and communities involved in the scallop fishery since no fishing practices would change. However, the alternative to modify scallop dredges to having a maximum of seven rows of apron rings may, if the beneficial impacts from reducing mortality on small scallops do occur, have positive long-term social impacts on the *Historical Dependence on and Participation* in the fishery and on the *Size and Demographic Characteristics* of the fishery-related work force from higher biomass in the future. It is also possible that the adoption of this alternative could have a small but positive impact on the formation of *Attitudes and Beliefs* regarding government and management because it would allow fishermen to use gear that has less negative impact on the environment. Reducing impact on other fisheries would certainly have positive social impacts on fishermen who participate in the affected fisheries. Since most scallop fishermen would have to modify their scallop dredges to comply, however, there would be short-term economic costs and short-term negative social impacts on the *Size and Demographic Characteristics* of the scallop fishery. The alternative to eliminate any restriction on the number of apron rings would have uncertain impacts on the scallop biomass and on bycatch biomass. Depending on whether fishermen changed the apron rings and in which direction, this alternative could have negative or positive impacts on the *Historical Dependence on and Participation* in the fishery, the *Size and Demographic Characteristics* of the fishery-related work force, and *Attitudes and Beliefs*.

Modify existing AMs

If Alternative 1 (no action) is adopted there will likely be no near-term social impacts felt by the individuals and communities involved in the scallop fishery since no fishing practices would change. However, the alternative to modify scallop dredges to having a maximum of seven rows of apron rings may, if the beneficial impacts from reducing mortality on small scallops do occur, have positive long-term social impacts on the *Historical Dependence on and Participation* in the fishery and on the *Size and Demographic Characteristics* of the fishery-related work force from higher biomass in the future. It is also possible that the adoption of this alternative could have a small but positive impact on the formation of *Attitudes and Beliefs* regarding government and management because it would allow fishermen to use gear that has less negative impact on the environment. Reducing impact on other fisheries would certainly have positive social impacts on fishermen who participate in the affected fisheries. Since most scallop fishermen would have to modify their scallop dredges to comply, however, there would be short-term economic costs and short-term negative social impacts on the *Size and Demographic Characteristics* of the scallop fishery. The alternative to eliminate any restriction on the number of apron rings would have uncertain impacts on the scallop biomass and on bycatch biomass. Depending on whether fishermen changed the apron rings and in which direction, this alternative could have negative or positive impacts on the *Historical Dependence on and Participation* in the fishery, the *Size and Demographic Characteristics* of the fishery-related work force, and *Attitudes and Beliefs*.

1.5.6 measures to allow a limited access vessel to declare out of fishery on return to homeport

Alternative 2, the DOF from anywhere alternative, could have regional distributional impacts compared to No Action, depending on how fishermen ultimately change their behavior in response to the alternative. If modeling of behavior is correct (see Economic Impacts section), then the charge to DAS and loss of revenue to vessels in MA and NJ would result in small to moderate negative social impacts to the *Size and Demographic Characteristics* of the fishery-related work force residing in these areas (and small to moderate positive social impacts in VA/NC); small to moderate negative social impacts to the *Historical Dependence on and Participation* in the fishery by fishermen, especially crew, in MA and NJ (and small to moderate positive social impacts in VA/NC); and negative impacts to *Social Structure and Organization* on shoreside facilities in MA and NJ if landings are redirected away from ports closer to fishing grounds and to ports closer to homeports (and positive social impacts in VA/NC). The alternative could have positive social impacts on the *Non-Economic Social Aspects* on fishermen in VA/NC if it changes the length of fishing trips and time spent away from home communities. It could also have positive social impacts on the *Attitudes, Beliefs and Values* of fishermen in VA/NC to the extent that it might rectify a regulation that may be perceived as inequitably charging DAS to fishermen in VA/NC to begin with. Alternative 3, given that it applies only to ports south of Cape May, would be expected to have similar impacts as Alternative 2, expect that the negative impacts would be lessened at the expense of slightly reduced positive impacts.

1.5.7 modify regulations related to flaring bar provision for turtle deflector dredge

Since the alternative under consideration is administrative and is expected to have no direct impacts on the scallop catch efficiency of the gear, no significant social impacts on fishermen are to be expected. Since the alternative under consideration is related to safe handling of gear, however, it may have a positive impact on the *Attitudes, Beliefs and Values* of anyone involved in the fishery, as well as a positive impact on the *Non-Economic Social Aspects* of the proposed action or policy, through enhancing health and safety issues.

1.6 ECONOMIC IMPACTS

The following sections analyze the economic impacts of the management alternatives considered in Framework 26 and compare these with No Action alternative. 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 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." Even without action, the scallop stock abundance in open and access areas will be different, requiring changes in open area DAS and trip allocations in order to maximize yield from the fishery over the long-term. As a result, landings, scallop prices, fishing costs, revenues and benefits from the fishery would change.

Furthermore, the Guidelines indicate that "the baseline is what is likely to occur in the absence of any of the proposed actions" and that "The No Action alternative should be the basis of comparison for other alternatives. However, the 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]. Therefore, the consistency of the Framework 26 analyses with these guidelines require that the biological and economic impacts of the proposed specification measures compared to the "No Action" scenario as defined in Section 2.2.1.1 of the document.

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."

The overall benefit and costs of the fishery management actions generally vary over time depending on the rate of growth of the stock and according to the nature of management measures implemented to maximize the yield from fishery. Although a general guideline for the period of analysis cannot be established for all fishery management actions due to the diversity of possible situations and measures to be dealt with, the Guidelines state that "the period of analysis could reflect the time it takes for the fishery to move from its initial equilibrium along the expansion path to the final equilibrium point (including the time needed for the present value of costs and benefits to approximate zero) due to the adoption of the proposed regulation, holding all other influence constant." In addition, the 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."

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

[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

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."[3]

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). OMB Circular points out that the analytically preferred method of handling temporal differences between benefits and costs is to adjust all the benefits and costs to reflect their value in equivalent units of consumption and to discount them at the rate consumers and savers would normally use in discounting future consumption benefits (OMB, 2003). Discount rate is the interest rate used in calculating the present value of expected yearly benefits and costs. This Circular suggests that for regulatory analysis, the cost-benefit analyses should provide estimates of net benefits using both three percent and seven percent.

This section examines the economic impacts of the proposed regulations in Framework 26. Although Framework 26 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 1.6.2. 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.

1.6.1 Acceptable Biological Catch (Section 2.1.1)

1.6.1.1 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 new 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 2015, the overall ABC for each year would be identical to that of the default FY 2014 ABC for the fishery.

No Action ABC is lower than the proposed ABC in this action because biomass has increased from 2014 levels. However, the difference between No Action ABC and the proposed ABC in FW26 is similar and not great enough to have direct impacts on the fishery specifications set in the framework. Therefore, the potential impacts of the No Action ABC on economic benefits are neutral.

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

1.6.1.2 ABC for 2015 and default for 2016

The updated OFL and ABC estimates are higher than the No Action default values because updated surveys suggest scallop biomass is higher than previous estimates. Overall, using these estimates to set fishery specifications should 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. However, as indicated above, the difference between No Action ABC and the proposed ABC in FW26 is similar and not great enough to have direct impacts on the fishery specifications set in the framework. Therefore, the potential impacts of the updated ABC on economic benefits compared to No Action values are neutral.

1.6.2 Economic impacts of the Framework 26 specification alternatives

- **1.1.2.1 Summary of overall specification alternatives considered in this action**

Framework 26 includes three allocation alternatives (ALT2, ALT3, and ALT4) in addition to the "No Action" scenario (ALT1). These alternatives allocate a different number of open area DAS and access area trips in 2015. The biological model projected landings, LPUE and size composition of landings for each of these alternatives for 2015-2028. These projections were then used as inputs in the economic model to estimate prices, revenues, costs, producer and consumer surpluses and total economic benefits from the scallop fishery. The impacts of alternatives on individual vessels are expected to be proportional to the aggregate impacts on revenues, fishing costs and net revenues (producer surplus).

The consistency of the Framework 26 analyses with the Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007) [4] require that the biological and economic impacts of alternatives compared to the "No Action" (i.e., without the action) alternative as defined in Section 2.1.2.1 of the document. The definition of "No Action" follows a regulatory approach and refers to continuation of the allocations that are specified in the present regulations so long as they are compatible with the other measures included in those regulations. Therefore, the "No Action" alternative does not reflect, a "state" or baseline that correspond to the same amount of fishing effort in 2015, but rather it refers to "what is likely to occur in the absence of any of the proposed actions". If No Action was taken in 2015, specifications would include default measures approved in Framework 25 for FY2015. Accordingly open area DAS allocations will equal to 17 days-at-sea per full-time vessels, or 75% of the allocations in 2014 (31 days) and no access area allocations. As a result, total landings are projected to equal 19.3 million lb. under the No Action scenario.

The economic analyses provided for this framework also includes a status quo scenario *(SQ)* to reflect the changes in landings and economic benefits as a result of projected changes in the scallop resource stock and the composition of landings. The status quo in this action reflects a scenario equivalent to the allocations in the 2014 fishing year, that is, 31 open area days and 2 access area trips, resulting in a projected landings of 37.5 million lb. in 2015 fishing year. It is important to point out that Status quo is not a real alternative, but just a scenario to be used the

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

evaluate the economic impacts of the proposed alternatives if there was no change in the allocations from the levels in 2014 fishing year.

For the purposes of Framework 26 analyses, the projected economic benefits for alternatives will be compared both to the benefits for Status Quo and the No Action in Table 9 and Table 10 below. The comparisons to the No Action address the requirement of regulations regarding the cost-benefit analyses. However, in the rest of the document, comparisons were mainly made with SQ since that scenario more properly reflects a 'state' or a baseline similar to the conditions in 2014 providing a better insight about the impacts of the proposed alternatives compared to status quo management.

Section 1.6.2.1.1 to 1.6.2.1.4 provide a summary of the economic impacts of each alternative separately, in terms of landings, revenues and total economic benefits (producer surplus plus consumer surplus) followed by in 1.6.2.1.5, a discussion of the comparative impacts of the specification alternatives. Section 1.6.2.1.5.1 to Section 1.6.2.1.5.5 provide a detailed discussion of economic impacts for landings, prices, effort, employment, trip costs, consumer and producer surpluses and total economic benefits.

Table 9. Economic Impacts for 2015: Estimated landings (Mill.lb.) and revenues (Mill. $) (in inflation adjusted 2014 values) (2012 Fishyear revenues=$577 million, estimated revenues for Fishyear 2013=$471million adjusted for inflation in 2014 prices)

Values	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	3.NL+ETA	4. Reduced F	Extra GC with 2 closures	Status quo (SQ)
FT LA Open area DAS	17	31	30	30	31	31	30	31
Total landings (Mill. lb.)	19.3	45.2	46.3	46.4	47.4	45.2	47.4	37.5
Difference from No Action		25.9	27.1	27.2	28.1	25.9	28.2	18.2
Difference from SQ	-18.2	7.7	8.9	9.0	9.9	7.7	10.0	
Total revenue (Mill. $)	263.0	557.8	567.1	570.3	578.1	557.6	580.3	477.2
Difference from No Action		294.8	304.1	307.3	315.2	294.7	317.3	214.2
Difference from SQ	-214.2	80.6	89.9	93.1	101.0	80.4	103.1	
Producer Surplus (Mill. $)	245.3	516.0	524.7	527.4	534.8	515.9	536.5	442.2
Difference from No Action		270.7	279.4	282.1	289.5	270.5	291.2	196.9
Difference from SQ	-196.9	73.8	82.5	85.1	92.6	73.6	94.2	
Total Economic Benefits (Mill. $)	248.5	542.0	551.7	554.8	563.1	541.8	565.1	459.9
Difference from No Action		293.5	303.3	306.3	314.6	293.3	316.6	211.4
Difference from SQ	-211.4	82.1	91.9	94.9	103.3	81.9	105.2	

Table 10. Long-term Impacts: Cumulative present value of revenues, producer surplus and total economic benefits *net of status quo* values (in 2014 inflation adjusted values and at 3% discount rate)

Values	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	3.NL+ETA	4. Reduced F	Extra GC with 2 closures	Status quo
Total landings (million lb.)	854.9	846.5	849.8	843.6	846.6	843.4	842.2	841.3
Total landings *net of No Action* landings (million lb.)		-8.4	-5.1	-11.3	-8.3	-11.5	-12.7	-13.6
Total landings *net SQ* landings (million lb.)	13.6	5.2	8.5	2.4	5.3	2.2	0.9	
Cumulative Present values	**At 3% discount rate**							
Revenue ($ million)	8077.6	8118.4	8123.9	8098.4	8105.9	8088.7	8088.4	8041.7
Producer Surplus ($ million)	7468.6	7507.5	7512.8	7489.2	7496.6	7480.0	7479.9	7435.7
Total Benefits ($ million)	8024.7	8037.5	8045.7	8015.3	8024.0	8005.3	8004.3	7959.6
Cumulative Present values	**At 7% discount rate**							
Revenue ($ million)	6467.3	6541.7	6534.2	6524.8	6521.0	6512.6	6520.0	6461.2
Producer Surplus ($ Million)	5979.1	6048.8	6042.5	6033.5	6030.5	6022.0	6029.0	5974.1
Total Benefits ($ Million)	6429.1	6478.5	6472.5	6459.7	6456.1	6447.1	6454.2	6396.7
Difference from status quo	**At 3% discount rate**							
Revenue ($ Million)	35.9	76.7	82.2	56.7	64.2	47.0	46.7	
Producer Surplus ($ Million)	32.8	71.8	77.1	53.5	60.9	44.3	44.1	
Total Benefits ($ Million)	65.1	78.0	86.1	55.7	64.4	45.8	44.7	
Difference from No Action	**At 3% discount rate**							
Revenue ($ Million)		40.9	46.3	20.8	28.3	11.1	10.8	-35.9
Producer Surplus ($ Million)		39.0	44.3	20.7	28.0	11.5	11.3	-32.8
Total Benefits ($ Million)		12.9	21.0	-9.4	-0.7	-19.4	-20.4	-65.1
Difference from Status Quo	**At 7% discount rate**							
Revenue ($ Million)	6.0	80.4	73.0	63.5	59.7	51.4	58.8	
Producer Surplus ($ Million)	5.1	74.7	68.4	59.5	56.4	47.9	54.9	
Total Benefits ($ Million)	32.3	81.7	75.8	62.9	59.4	50.3	57.5	
Difference from No Action	**At 7% discount rate**							
Revenue ($ Million)		74.4	66.9	57.5	53.7	45.3	52.8	-6.0
Producer Surplus ($ Million)		69.7	63.3	54.4	51.4	42.9	49.9	-5.1
Total Benefits ($ Million)		49.4	43.5	30.6	27.1	18.0	25.2	-32.3

1.6.2.1.1 No Action: Summary of economic impacts

As a result of fewer open area DAS (17 days instead of 31 days in 2015) and no allocations to access areas, the landings are projected to be 19.3M lb., revenues are estimated to be $263.0 million, and total economic benefits are estimated to be $248.5 for No Action, much lower compared to the other alternatives in 2015 (Table 1). Over the long-term from 2015 to 2028, the present value of revenues, producer surplus and total economic benefits under No Action will still be lower compared to all alternatives using a 7% discount rate except for compared to the

status quo scenario. This is because the large negative impacts in 2015, about $300 million reduction in revenue compared to ALT2 to ALT4, outweighs the positive impacts on landings and economic benefits after 2015 (Table 10). However, if the future benefits were discounted less, i.e., at 3%, then the long-term economic benefits of No Action would exceeds the benefits for ALT3 with 3 closures as well as the benefits for ALT4 and SQ scenarios.

1.6.2.1.2 ALT2 -Basic Run using fishing mortality target principles in the FMP with no modifications to scallop access area boundaries

ALT2 would have short and long term positive economic impacts compared to the No Action and Status quo scenarios. This alternative would result in higher landings (45.2M lb.), revenues ($557.8M), and total economic benefits ($542M) in 2015 compared to No Action because it allows 2 access area trips while keeping the open area days at 31 DAS. Revenues for Alternative 2 in 2015 would be $80.6 million higher and total economic benefits would be $82.1 million higher than SQ. Over the long-term from 2015 to 2028, the present value of revenues, producer surplus and total economic benefits under this alternative would be higher than No Action and the SQ scenarios as well.

1.6.2.1.3 ALT3 with 3 closures and options with 2 closures

Three different closure modifications to existing access areas are under consideration in this alternative to reduce impacts on small scallops observed in various areas. Option 1 is an extension of the scallop access area in Closed Area II (CA2) to include concentrations of small scallops that are near existing boundaries of current access area. Option 2 is an extension of the scallop access area in Nantucket Lightship (NL) to include concentrations of small scallops that are near existing boundaries of current access areas. Option 3 proposes to close areas *within* current scallop access areas or a temporary prohibition to fish in a subset of a current scallop access area and is confined to Elephant Trunk (ETA).

The PDT ran three separate model runs to assess the impacts of this alternative. Run 3 included all three closure options, and Run 4 only included CA2 and NL closure and Run 8 included only NL and ETA closures, which was added as an alternative at the Nov.14th Scallop Committee meeting. For all these options, ALT3 would have short and long term positive economic impacts compared to both No Action, and the SQ scenario because it would allocate more open area DAS than no Action and also would allocate three access area trips rather than none under No Action and two trips under SQ.

The revenues and total economic benefits for this alternative would be slightly lower with three closures (prohibiting access in northwest corner of ETA) than that of ALT3 with two closures in the short-term, with landings of about 46.3M lb. (46.4M lb. for two closures), revenues of about $567.1M ($570.3M for 2 closures), and total economic benefits of $551.7M ($554.8M for 2 closures) in 2015. Limiting the new closures to two areas, NLS and ETA, will increase the open area DAS by one days and the estimated landings by 1.1 million lb. in the 2015 fishing year, resulting in about $11 million higher revenues and in over $11.4 million in higher total economic benefits in the 2015 fishing year compared to the three closures that includes closing CA2.

Over the long-term from 2015 to 2028, however, the present value of revenues, producer surplus and total economic benefits for ALT3 with 3 closures would exceed the values for ALT3 with 2 closures whether that included CA2 or ETA (Table 10). Over the long-term, the total economic benefits of ALT3 with 3 closures would be $75.8 million (at 7% discount rate) to $86.1 million (at 3% discount rate) higher than the benefits for SQ scenario. Total economic benefits for the two closure option that includes a closure of CA2 but not ETA would be $55.7 million (at 7% discount rate) to $62.9 million (at 3% discount rate) higher than the benefits for SQ scenario. However, the alternative that would closure NL and ETA only would result in higher benefits ($64.4 million) over the long-term compared to the option that closes CA2 and NL using a 3% discount rate. However, the economic benefits of closing NL and ETA would be slightly lower over the long-term compared to closing CA2 and NL if the future benefits are discounted at 7% because the benefits of closing ETA would accrue in later years. In short, ALT3 with three closures will have slightly lower revenues and economic benefits in 2015, but higher revenues and total economic benefits over the long-term compared to ALT3 with two closures.

1.6.2.1.4 ALT4 - Reduced F for MA access areas to reduce incidental mortality on small scallops

Because this alternative would provide 31 open area days and three access area trips, it would have short and long term positive economic impacts compared to the No Action, except when future benefits are discounted at a lower rate (3%), total economic benefits for ALT4 would be lower compared to the No Action total benefits. This is because, under no Action, future landings are higher and prices are lower than projected for ALT4, resulting in a higher consumer surplus, which constitutes a part of total economic benefits (Table 1 and Table 10). Revenues, producer surplus and total economic benefits for ALT4 would exceed the Status quo levels both in 2015 (mainly due to allocation of three instead of two access area trips) and over the long term as well.

1.6.2.1.5 Comparison of economic impacts of specification alternatives

This section provides a discussion of the comparative impacts of the Framework 26 alternatives on landings, prices, revenues, costs, employment, consumer and producer surpluses and total economic benefits. Although the Tables include the results of the run with extra allocations to the LAGC IFQ fishery and the SQ scenario, the discussion in this section will highlight a comparison of the alternatives ALT2, ALT3 and ALT4 with No Action as well as with Status quo (SQ). The projections with extra allocations to the LAGC IFQ fishery will be discussed in Section 1.2.2.2 in evaluating the economic impacts of this option. These results are summarized for 2015 fishing year and over the long-term (2015-2028) as follows:

- Alternatives ALT2 to ALT4 would allocate 3 access area trips and about 30 to 31 open area DAS, considerably higher than the allocations for No Action and higher than the two access trips for SQ. Consequently, the landings and revenues for those alternatives (ALT 2 to ALT 4) are projected to exceed the landings for No Action levels in 2015 fishing year (Table 1).
- The landings under those alternatives range from 45.2 million lb. for ALT2 and ALT4, and over 46 million lb. for ALT3 in 2015, exceeding the projected landings both under No action (by more than 25M lb.) and SQ (by more than 7.7M lb., Table 1).
- Starting with 2016 and over the long-term, the landings for all alternatives are expected to be lower than the No Action levels because the drastic reduction in landings to only

19.3 million lb. or less than one half of the landings compared other alternatives in 2015, the scallop stock yield is expected to increase significantly allowing higher landings in the rest of the period. (Table 2). The cumulative sum of landings over the long-term for all alternatives exceeds the landings for SQ scenario, however.

- Overall, ALT3 with 3 closures is estimated to result in second highest landings in the long-term compared to No Action exceeding the landings under SQ by 8.5 million, and other alternatives by about 3M lb. to 6M lb. The projected landings for ALT3 with three closures are slightly lower than landings with 2 closures, but much lower in 2016 compared to landings with two closures and landings for other alternatives.
- ALT3 with both options (2 or 3 closures) would have higher revenues and total economic benefits compared to both ALT2 ($557.8M revenue, and $542M total benefits) and ALT4 in 2015 ($557.6M in revenues and $565.1M in total economic benefits, Table 1). ALT3 with 2 closures would have slightly higher economic benefits in 2015 compared to the option with 3 closures. ALT4 would have the lowest economic benefits in 2015 (Table 1). The increase in present value of total economic benefits will range from about $82 million (ALT2 and ALT4) to $85 million (ALT 3, 2 closures) in 2015.
- Even though the sum of landings over the long-term (2015-2028) is lower than landings for No Action alternative, the long-term present value of revenues, producer surplus (revenue net of trip costs) and total economic benefits (consumer plus producer surplus) will exceed the No Action values for all alternatives using a 7% discount rate. This is mainly because the increase in revenues compared to No Action levels is quite large in 2015 (ranging from about $270.7 million for ALT2 and ALT4 to $282.1 million for ALT3), outweighing the negative impacts on revenues in the rest of the period (Table 1 and Table 2). The present value of the cumulative economic benefits for ALT2 would exceed the benefits of the other alternatives over the long-term when the future benefits are estimated using a discount rate of 7% (2015-2028, Table 2).
- If the long-term present value of the cumulative economic benefits were calculated using a discount rate of 3%, that is, by giving more weight to future benefits compared to discounting at 7%, both ALT3 with 2 closures and ALT4 would have lower economic benefits compared to No Action and ALT3 with 3 closures would generate the largest net benefits to the nation compared to all the other alternatives (Table 3).
- Although the present value of the revenues, producer and total economic benefits (absolute values) would be slightly lower for all alternatives if a 7% discount rate was applied, the increase in those values compared to No Action levels would be larger. This is because, a 7% discount rate places less weight to decline in future revenue compared to a 3%. As a result, increase in the short-term revenue outweighs the decline in future revenue to a greater degree, changing the rank of alternatives in terms of their impacts on the revenues and total economic benefits (Table 10).
- It should be pointed out that the actual values of revenues for all alternatives could potentially exceed those shown in Table 1 to Table 10. They are based on conservative estimates for prices (Table 13 below) assuming no change in import prices, disposable income and exports in order to separate out the impacts of landings on prices. However, the reverse is possible too, if for example, import prices and exports decline resulting in lower prices than estimated. The results would also depend on how close the actual landings will be to the projected landings in 2015 and in future years. For these reasons, projected numbers for revenues and economic benefits should be mainly used for

comparing one alternative with another rather than for predicting the actual values for future years.

- As compared to the status quo, the overall DAS used will increase by 19.5% (ALT2) to 22.8% (ALT3 with 2 closures) in 2015 (
- Table **21**). Therefore, the level of employment in the scallop fishery as measured by CREW*DAS will be higher under all alternatives compared to status quo.
- Finally, each specification alternative also includes default measures for 2016 fishing year that would be in place until the next Framework action is implemented. Instead of rolling over the projected DAS in 2015 until the new Framework is implemented, the proposed measures would allocate only 75% of the projected DAS in FY2015 for LA vessels or a 20 day minimum if 75% of projected DAS are less than 20 DAS to prevent potentially negative impacts on the resource and scallop yield. Thus those measures are expected to have positive economic benefits for the scallop fishery in the long-term.

The following sections describes the detailed results of the proposed options on landings, effort, prices, revenues, producer and consumer surpluses and total economic benefits annually (for 2015 and beyond) and also for distinct periods including short-term (2015-2016) and long-term (2015 to 2028) for all alternatives.

1.6.2.1.5.1 Impacts on Landings, Price and Revenue

The alternatives two and four (ALT2, ALT3 with 2 closures ALT4) would result in higher landings in the short-term (2015-2016) compared ALT3 with 3 closures (Table 5). Because No Action would allocate zero access area trips and keep the open area DAS allocation at 17 DAS per LA vessel, the landings with No Action would be about 19.3 million lb. in 2015, while under the alternatives ALT2 to ALT4, it would exceed 45 million lb. For the overall long-term period from 2015 to 2028, however, landings for No Action are estimated to exceed the levels for the for the rest of the alternatives due to the increase in scallop yield resulting from a drastic reduction in landings to 19.3M lb. in 2015 under No Action. Landings for all alternatives other than NO Action, however, will exceed the SQ levels both in 2015 and over the long-term.

Table 11. Estimated landings (Million lb.) (Estimated landings in 2014, 40 to 41 mill.lb.)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status Quo	3.NL+ETA
2015-2016	2015	19.3	45.2	46.3	46.4	45.2	47.4	37.5	47.4
	2016	75.7	66.7	54.8	63.9	66.6	63.0	68.5	56.5
2015-2016 Total		**95.0**	**111.8**	**101.1**	**110.4**	**111.7**	**110.4**	**105.9**	**103.9**
2017-2019	2017	83.7	75.3	73.9	74.3	75.2	73.9	76.4	73.5
	2018	73.4	68.4	73.7	68.8	68.2	69.0	68.1	72.1
	2019	65.6	62.3	70.9	66.3	61.0	67.2	60.8	64.2
2017-2019 Total		**222.7**	**206.0**	**218.6**	**209.4**	**204.5**	**210.1**	**205.3**	**209.8**
2020-2028	2020	62.0	61.1	60.7	58.4	58.4	58.9	59.9	60.9
	2021	60.1	60.4	59.3	57.6	57.5	57.7	59.3	60.6
	2022	59.5	59.3	58.3	57.9	58.2	58.1	58.0	60.3
	2023	59.0	58.1	57.9	58.2	58.8	58.6	57.2	59.8
	2024	58.7	57.3	58.3	59.2	58.9	58.1	57.5	59.4
	2025	59.0	57.9	59.0	59.2	59.3	57.6	58.3	58.1
	2026	59.6	58.4	59.3	58.6	59.4	57.4	59.5	57.5
	2027	59.8	58.1	58.8	57.7	58.5	57.5	60.3	58.0
	2028	59.6	57.9	58.4	57.3	58.3	57.9	60.0	58.4
2020-2028 Total		**537.2**	**528.6**	**530.1**	**523.9**	**527.2**	**521.7**	**530.0**	**532.9**
Grand Total		**854.9**	**846.5**	**849.8**	**843.6**	**843.4**	**842.2**	**841.3**	**846.6**

Table 12. Estimated landings net of SQ levels (Million lb.)

Sub Period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3.NL+ETA
2015-2016	2015	-18.2	7.7	8.9	9.0	7.7	10.0	9.9
	2016	7.2	-1.8	-13.7	-4.5	-1.9	-5.5	-12.0
2015-2016 Total		**-11.0**	**5.9**	**-4.9**	**4.4**	**5.8**	**4.5**	**-2.1**
2017-2019	2017	7.3	-1.1	-2.5	-2.1	-1.2	-2.6	-3.0
	2018	5.3	0.3	5.7	0.7	0.1	1.0	4.0
	2019	4.7	1.5	10.1	5.4	0.2	6.4	3.4
2017-2019 Total		**17.4**	**0.7**	**13.3**	**4.0**	**-0.9**	**4.8**	**4.4**
2020-2028	2020	2.1	1.3	0.8	-1.5	-1.5	-1.0	1.0
	2021	0.8	1.1	0.0	-1.7	-1.8	-1.6	1.3
	2022	1.4	1.2	0.3	-0.2	0.2	0.0	2.2
	2023	1.8	0.9	0.7	1.0	1.6	1.4	2.6
	2024	1.2	-0.2	0.9	1.7	1.4	0.6	1.9
	2025	0.6	-0.4	0.6	0.8	1.0	-0.8	-0.2
	2026	0.1	-1.1	-0.2	-0.9	-0.2	-2.1	-2.0
	2027	-0.5	-2.2	-1.4	-2.6	-1.8	-2.8	-2.3
	2028	-0.3	-2.0	-1.6	-2.7	-1.7	-2.1	-1.5
2020-2028 Total		**7.2**	**-1.4**	**0.1**	**-6.1**	**-2.7**	**-8.3**	**3.0**
Grand Total		**13.6**	**5.2**	**8.5**	**2.4**	**2.2**	**0.9**	**5.3**

Prices are estimated using the ex-vessel price model that takes into account the impacts of changes in meat count, domestic landings, exports, import prices, income of consumers, and composition of landings by market category (i.e., size of scallops) including a price premium on

under count 10 scallops. The price estimates shown in Table 7 correspond to the price model outputs assuming that the import prices will be constant at their 2014 levels, scallop exports will constitute about 43% of the domestic landings (average ratio for 2011-2013 fishing years), and the disposable income will be constant at the current levels in 2014, so that only the effects of the reduction in and changes in the size composition of landings could be identified. As such, these are conservative estimates for prices and actual prices could be higher (lower) than the values estimated in Table 7 if the import prices, exports and disposable income increase (decrease) in the future years.

Although the absolute values for revenues, producer and consumer surpluses, and total economic benefits would change with the value of estimated prices, the percentage differences of these values for alternatives 2 to 4 relative to the No Action or Status Quo scenarios would not change in any substantial way. Higher prices than estimated in Table 7 will increase the short-term positive impact of all the alternatives on revenues compared to No Action, while lower prices reduce this impact. The long-term benefits will be greater with higher prices and smaller with lower prices, however.

Table 13. Estimated ex-vessel prices (in 2014 inflation adjusted prices)
(Estimated price in Avg. Price in 2012=$10.1, 2013=$11.68 in inflation adjusted 2014 prices)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status Quo	3.NL+ ETA
2015-2016	2015	13.65	12.35	12.24	12.28	12.35	12.24	12.74	12.20
	2016	10.89	11.24	11.74	11.35	11.25	11.39	11.15	11.66
2015-2016 Total		**12.06**	**12.27**	**11.79**	**11.99**	**11.82**	**11.80**	**11.81**	**11.93**
2017-2019	2017	10.50	10.82	10.88	10.87	10.83	10.89	10.77	10.89
	2018	10.95	11.17	10.94	11.16	11.17	11.15	11.17	11.00
	2019	11.27	11.43	11.11	11.31	11.47	11.27	11.48	11.33
2017-2019 Total		**10.73**	**10.91**	**11.14**	**10.98**	**11.11**	**11.15**	**11.10**	**11.07**
2020-2028	2020	11.46	11.52	11.51	11.61	11.62	11.58	11.57	11.53
	2021	11.58	11.56	11.58	11.68	11.69	11.66	11.58	11.55
	2022	11.61	11.61	11.64	11.67	11.67	11.66	11.64	11.56
	2023	11.63	11.66	11.67	11.68	11.64	11.63	11.69	11.59
	2024	11.65	11.70	11.66	11.63	11.63	11.65	11.69	11.60
	2025	11.66	11.69	11.63	11.61	11.62	11.68	11.65	11.65
	2026	11.62	11.66	11.61	11.64	11.61	11.69	11.60	11.70
	2027	11.61	11.67	11.63	11.68	11.64	11.70	11.56	11.68
	2028	11.61	11.69	11.66	11.71	11.67	11.69	11.57	11.66
2020-2028 Total		**11.41**	**11.60**	**11.64**	**11.62**	**11.66**	**11.64**	**11.66**	**11.61**
Grand Total		**11.55**	**11.55**	**11.54**	**11.56**	**11.56**	**11.56**	**11.56**	**11.54**

The economic impacts of the alternatives considered in this Framework were compared in Table 9 and Table 10 with the No Action alternative to be consistent with the definition provided in Section 2.2.1 and with Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007). The value of the estimated revenue alternatives ALT2 to ALT4 would be higher in the short-term (2015) compared to No Action. The main reason for this is that the regulations would allow no access area trip allocations in 2015 and area DAS allocations will equal to 17 days-at-sea per full-time vessels compared 3 trips and at least 30 open areas days for

other alternatives. In this section, however, comparisons were mainly made to the Status quo values since that provides a scenario with No Action in the allocations compared to the allocations in the 2014 fishing year.

The impacts of the Framework 26 alternatives on the annual revenues and the present value of the cumulative revenues for each period are shown in Table 14 (undiscounted values) and in Table 15 (at 3% discount rate) to Table 18 (at 7% discount rate). ALT3 with both options (2 or 3 closures) would have higher revenues and total benefits compared to both ALT2 ($557.8M revenue, and $542M total benefits) and ALT4 in 2015 ($557.6M revenues and $565.1 total economic benefits, Table 1) If the future revenues and economic benefits were discounted at a higher rate (7% versus 3%), the revenues and benefits for ALT3 with 3 closures would be lower than the value of benefits for ALT2.

Table 14. Scallop Revenue Projections (Million $, in 2014 inflation adjusted values prices, not discounted) (2012 Fishyear revenues=$577 million, estimated revenues for Fishyear 2013=$471million adjusted for inflation in 2014 prices)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status Quo	3. NL+ETA
2015-2016	2015	263.0	557.8	567.1	570.3	557.6	580.3	477.2	578.1
	2016	824.5	749.4	642.7	726.0	748.7	717.5	763.9	658.7
2015-2016 Total		**1087.5**	**1307.2**	**1209.8**	**1296.3**	**1306.3**	**1297.8**	**1241.1**	**1236.9**
2017-2019	2017	879.5	814.7	804.5	807.3	814.3	804.4	822.9	800.0
	2018	804.2	764.2	806.9	768.0	762.3	769.7	760.2	793.5
	2019	739.2	712.2	788.0	749.6	699.6	757.1	698.6	727.5
2017-2019 Total		**2422.9**	**2291.1**	**2399.4**	**2324.8**	**2276.2**	**2331.2**	**2281.7**	**2321.0**
2020-2028	2020	710.5	704.1	698.3	678.2	678.1	682.0	692.4	701.5
	2021	695.8	697.9	687.2	672.3	671.9	672.6	686.9	700.0
	2022	690.3	688.1	678.9	675.3	679.6	676.9	675.3	696.5
	2023	686.3	677.9	675.9	679.1	684.1	681.0	668.9	692.8
	2024	683.5	670.7	680.0	688.0	685.3	676.5	672.0	689.0
	2025	687.3	677.4	685.6	687.3	689.4	672.5	679.8	677.2
	2026	692.7	681.3	688.9	681.7	689.1	671.2	690.7	673.0
	2027	693.5	677.5	684.1	673.5	681.4	672.7	696.7	677.0
	2028	692.7	677.1	681.2	670.7	680.3	677.0	694.2	681.5
2020-2028 Total		**6232.5**	**6152.0**	**6160.0**	**6106.1**	**6139.1**	**6082.5**	**6156.9**	**6188.5**
Grand Total		**9742.9**	**9750.3**	**9769.1**	**9727.2**	**9721.7**	**9711.5**	**9679.6**	**9746.3**

Table 15. Present value of total scallop revenue (Million $, using 3% discount rate, in 2014 inflation adjusted prices)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status Quo	3. NL+ETA
2015-2016	1063.5	1285.4	1191.0	1275.1	1284.5	1276.9	1218.8	1217.7
2017-2019	2221.7	2100.0	2196.8	2129.7	2086.8	2135.3	2092.0	2126.6
2020-2028	4792.4	4733.0	4736.0	4693.5	4717.4	4676.3	4730.8	4761.6
Grand Total	**8077.6**	**8118.4**	**8123.9**	**8098.4**	**8088.7**	**8088.4**	**8041.7**	**8105.9**

Table 16. Present value of total scallop revenue net of Status quo revenue (Million $, using 3% discount rate, in 2014 inflation adjusted prices)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-155.4	66.6	-27.8	56.3	65.7	58.0	-1.2
2017-2019	129.7	8.0	104.8	37.7	-5.2	43.2	34.6
2020-2028	61.6	2.2	5.2	-37.3	-13.4	-54.6	30.8
Grand Total	**35.9**	**76.7**	**82.2**	**56.7**	**47.0**	**46.7**	**64.2**

Table 17. Present value of total scallop revenue (Million $, using 7% discount rate)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status Quo	3. NL+ETA
2015-2016	1033.5	1258.2	1167.7	1248.8	1257.3	1250.8	1191.1	1193.8
2017-2019	1988.6	1878.7	1962.5	1903.8	1867.3	1908.5	1872.2	1901.5
2020-2028	3445.1	3404.8	3404.0	3372.2	3388.0	3360.7	3397.9	3425.7
Grand Total	**6467.3**	**6541.7**	**6534.2**	**6524.8**	**6512.6**	**6520.0**	**6461.2**	**6521.0**

Table 18. Present value of total scallop revenue net of status quo revenue (Million $, using 7% discount rate)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-157.6	67.1	-23.4	57.7	66.2	59.7	2.7
2017-2019	116.3	6.5	90.2	31.6	-5.0	36.2	29.2
2020-2028	47.3	6.9	6.1	-25.7	-9.9	-37.1	27.8
Grand Total	**6.0**	**80.4**	**73.0**	**63.5**	**51.4**	**58.8**	**59.7**

1.6.2.1.5.2 Impacts of Framework 26 specification alternatives on DAS, fishing costs and open area days and employment

Table 19 shows open area DAS per full-time vessel for each alternative and fishing year and Table 20 show total fleet DAS from all areas. 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 No Action because No Action alternative would allocate no access area trips and only 17 open area days. However, starting in 2016, total effort measured in terms of DAS used will be lower under those alternatives compared to No Action because lower fishing mortality in 2015 under the No Action alternatives makes it possible to allocate more access area trips and open area DAS in the future years.

As compared to the status quo, the overall DAS used will increase by 19.5% (ALT2) to 22.8% (ALT3 with 2 closures) in 2015 (
Table **21**). Therefore, the level of employment in the scallop fishery as measured by CREW*DAS will be higher under all alternatives compared to status quo. Employment level in

the scallop fishery as measured by CREW*DAS will be higher under all alternatives compared to No Action (ALT1) as well. Employment will be higher under ALT6 and ALT3 with 2 closured compared to other alternatives in 2015. Over the long-term, however, employment is not expected to change much compared to Status quo.

Total trip costs for the fleet vary with the total DAS-used for each alternative. Trip costs per DAS for the LA vessels are set at the values observed as of the recent fishing year, i.e. in 2015 ($2371 per DAS). Table 22 shows that those alternatives that allocate more DAS and access area trips result in higher trip costs both in the short-term and long-term, thus the trip costs would be higher for ALT2 to Alt4 compared to both No Action and SQ scenarios in 2015, but slightly lower over the long-term from No Action values.

Present value of the fleet costs are summarized in Table 23 using a discount rate of 3% and in Table 24 using a discount rate of 7%. In general, the differences in the cumulative present value of the trip costs are quite low, amounting to a million $ for over 15 years.

Table 19. Open area DAS per limited access vessel (average per year)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	2015	17	31	30	30	31	30	31	31
	2016	40	36	34	34	36	34	36	35
2015-2016 Total		**29**	**34**	**32**	**32**	**34**	**32**	**34**	**33**
2017-2019	2017	39	68	54	65	68	65	70	56
	2018	62	58	49	56	58	56	58	50
	2019	59	56	62	57	55	59	55	58
2017-2019 Total		**53**	**61**	**55**	**59**	**60**	**60**	**61**	**55**
2020-2028	2020	56	55	55	53	53	54	55	55
	2021	54	55	54	52	52	53	54	55
	2022	53	53	53	53	53	53	53	55
	2023	53	52	53	53	53	53	52	54
	2024	53	51	53	54	53	52	52	53
	2025	53	52	53	53	53	52	53	52
	2026	54	52	53	53	53	52	54	52
	2027	54	52	53	52	52	52	55	52
	2028	54	52	53	52	52	52	54	53
2020-2028 Total		**54**	**53**	**53**	**53**	**53**	**53**	**54**	**53**
Grand Total		**50**	**52**	**51**	**51**	**52**	**51**	**52**	**51**

Table 20. Total DAS (sum of open and access areas)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	4. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	2015	7441	17616	17873	18100	17611	18481	14742	18272
	2016	27217	24327	20218	23388	24293	23044	24878	20803
2015-2016 Total		**34658**	**41943**	**38091**	**41488**	**41904**	**41525**	**39620**	**39075**
2017-2019	2017	29307	26671	26103	26304	26644	26197	26992	25963
	2018	25615	24202	25795	24310	24107	24362	24023	25330
	2019	23391	22534	25263	23708	22018	24034	22032	23106
2017-2019 Total		**78313**	**73407**	**77161**	**74322**	**72769**	**74593**	**73047**	**74399**
2020-2028	2020	22400	22271	22022	21301	21298	21472	21870	22159
	2021	21929	22051	21694	21170	21139	21229	21673	22126
	2022	21747	21681	21425	21338	21457	21389	21306	22020
	2023	21616	21301	21333	21488	21611	21503	21115	21890
	2024	21546	21052	21490	21763	21658	21316	21257	21729
	2025	21709	21340	21675	21701	21801	21168	21549	21340
	2026	21883	21457	21786	21486	21751	21127	21944	21235
	2027	21892	21333	21600	21185	21472	21219	22129	21355
	2028	21868	21329	21523	21112	21451	21389	21985	21518
2020-2028 Total		**196590**	**193815**	**194548**	**192544**	**193638**	**191812**	**194828**	**195372**
Grand Total		**309561**	**309165**	**309800**	**308354**	**308311**	**307930**	**307495**	**308846**

Table 21. Percentage increase in total DAS compared to status quo DAS (Sum of open and access areas)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	4. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	3. NL+ETA
2015-2016	2015	-49.53%	19.50%	21.24%	22.78%	19.46%	25.36%	23.95%
	2016	9.40%	-2.21%	-18.73%	-5.99%	-2.35%	-7.37%	-16.38%
2015-2016 Total		**-12.52%**	**5.86%**	**-3.86%**	**4.71%**	**5.76%**	**4.81%**	-1.38%
2017-2019	2017	8.58%	-1.19%	-3.29%	-2.55%	-1.29%	-2.95%	-3.81%
	2018	6.63%	0.75%	7.38%	1.19%	0.35%	1.41%	5.44%
	2019	6.17%	2.28%	14.67%	7.61%	-0.06%	9.09%	4.87%
2017-2019 Total		**7.21%**	**0.49%**	**5.63%**	**1.75%**	**-0.38%**	**2.12%**	1.85%
2020-2028	2020	2.42%	1.83%	0.70%	-2.60%	-2.62%	-1.82%	1.32%
	2021	1.18%	1.74%	0.10%	-2.32%	-2.46%	-2.05%	2.09%
	2022	2.07%	1.76%	0.56%	0.15%	0.71%	0.39%	3.35%
	2023	2.37%	0.88%	1.03%	1.77%	2.35%	1.84%	3.67%
	2024	1.36%	-0.96%	1.10%	2.38%	1.89%	0.28%	2.22%
	2025	0.74%	-0.97%	0.58%	0.71%	1.17%	-1.77%	-0.97%
	2026	-0.28%	-2.22%	-0.72%	-2.09%	-0.88%	-3.72%	-3.23%
	2027	-1.07%	-3.60%	-2.39%	-4.27%	-2.97%	-4.11%	-3.50%
	2028	-0.53%	-2.98%	-2.10%	-3.97%	-2.43%	-2.71%	-2.12%
2020-2028 Total		**0.90%**	**-0.52%**	**-0.14%**	**-1.17%**	**-0.61%**	**-1.55%**	0.28%
Grand Total		**0.67%**	**0.54%**	**0.75%**	**0.28%**	**0.27%**	**0.14%**	0.44%

Table 22. Total trip costs (in 2014 inflation adjusted values prices, not discounted) ($ Million)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo	3. NL + ETA
2015-2016	2015	17.6	41.8	42.4	42.9	41.8	43.8	35.0	43.3
	2016	64.5	57.7	47.9	55.5	57.6	54.6	59.0	49.3
2015-2016 Total		**82.2**	**99.4**	**90.3**	**98.4**	**99.4**	**98.5**	**93.9**	**92.6**
2017-2019	2017	69.5	63.2	61.9	62.4	63.2	62.1	64.0	61.6
	2018	60.7	57.4	61.2	57.6	57.2	57.8	57.0	60.1
	2019	55.5	53.4	59.9	56.2	52.2	57.0	52.2	54.8
2017-2019 Total		**185.7**	**174.0**	**182.9**	**176.2**	**172.5**	**176.9**	**173.2**	**176.4**
2020-2028	2020	53.1	52.8	52.2	50.5	50.5	50.9	51.9	52.5
	2021	52.0	52.3	51.4	50.2	50.1	50.3	51.4	52.5
	2022	51.6	51.4	50.8	50.6	50.9	50.7	50.5	52.2
	2023	51.3	50.5	50.6	50.9	51.2	51.0	50.1	51.9
	2024	51.1	49.9	51.0	51.6	51.4	50.5	50.4	51.5
	2025	51.5	50.6	51.4	51.5	51.7	50.2	51.1	50.6
	2026	51.9	50.9	51.7	50.9	51.6	50.1	52.0	50.3
	2027	51.9	50.6	51.2	50.2	50.9	50.3	52.5	50.6
	2028	51.8	50.6	51.0	50.1	50.9	50.7	52.1	51.0
2020-2028 Total		**466.1**	**459.5**	**461.3**	**456.5**	**459.1**	**454.8**	**461.9**	**463.2**
Grand Total		**734.0**	**733.0**	**734.5**	**731.1**	**731.0**	**730.1**	**729.1**	**732.3**

Table 23. Present value of cumulative trip costs (in 2014 inflation adjusted values prices, at 3% discount rate, $ Million)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo	3. NL + ETA
2015-2016	80.3	97.8	88.9	96.8	97.7	96.9	92.2	91.2
2017-2019	170.4	159.6	167.5	161.5	158.2	162.0	158.9	161.7
2020-2028	358.4	353.6	354.6	350.9	352.8	349.6	354.9	356.4
Grand Total	**609.0**	**610.9**	**611.1**	**609.1**	**608.7**	**608.5**	**606.0**	**609.3**

Table 24. Present value of cumulative trip costs (in 2014 inflation adjusted values prices, at 7% discount rate, $ Million)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo	3. NL + ETA
2015-2016	78.0	95.7	87.2	94.7	95.6	94.9	90.1	89.4
2017-2019	152.6	142.8	149.7	144.4	141.7	144.9	142.2	144.6
2020-2028	257.6	254.4	254.9	252.1	253.3	251.3	254.8	256.5
Grand Total	**488.1**	**492.9**	**491.7**	**491.3**	**490.6**	**491.0**	**487.2**	**490.5**

1.6.2.1.5.3 Present Value of Producer Surplus

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. Annual values for the producer surplus are shown in Table 25 and indicate that ALT3 results in largest producer surplus in 2015 but smallest in 2016 fishing year. As a result, ALT3 with 3 closures would reduce the present value of the cumulative producer surplus for 2015-206 from the SQ levels, but would still result in higher producer benefits compared to the No Action.

The increase in present value of total producer surplus compared to Status Quo would range from $44.3M for ALT 4 to $77.1 million for ALT3 with 3 closures in the long-term using a discount rate of 3% (2015-2028, Table 19). However, discounting the future year at a higher rate (7%) would reverse the rank of alternatives in terms of the present value of producer surplus with ALT2 resulting in highest benefits.

Table 25. Annual values for producer surplus (Million $, in 2014 inflation adjusted values, not discounted)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	2015	245	516	525	527	516	536	442	535
	2016	760	692	595	671	691	663	705	609
2015-2016 Total		**1005**	**1208**	**1119**	**1198**	**1207**	**1199**	**1147**	**1145**
2017-2019	2017	810	751	743	745	751	742	759	738
	2018	743	707	746	710	705	712	703	733
	2019	684	659	728	693	647	700	646	673
2017-2019 Total		**2237**	**2117**	**2216**	**2149**	**2104**	**2154**	**2108**	**2145**
2020-2028	2020	657	651	646	628	628	631	641	649
	2021	644	646	636	622	622	622	635	648
	2022	639	637	628	625	629	626	625	644
	2023	635	627	625	628	633	630	619	641
	2024	632	621	629	636	634	626	622	637
	2025	636	627	634	636	638	622	629	627
	2026	641	630	637	631	638	621	639	623
	2027	642	627	633	623	630	622	644	626
	2028	641	626	630	621	629	626	642	630
2020-2028 Total		**5766**	**5692**	**5699**	**5650**	**5680**	**5628**	**5695**	**5725**
Grand Total		**9009**	**9017**	**9035**	**8996**	**8991**	**8981**	**8951**	**9014**

Table 26. Present value of producer surplus (using 3% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	983	1188	1102	1178	1187	1180	1127	1126
2017-2019	2051	1940	2029	1968	1929	1973	1933	1965
2020-2028	4434	4379	4381	4343	4365	4327	4376	4405
Grand Total	**7469**	**7508**	**7513**	**7489**	**7480**	**7480**	**7436**	**7497**

Table 27. Present value of producer surplus net of status quo values (using 3% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-143.4	61.0	-24.5	51.8	60.2	53.4	-0.1
2017-2019	118.2	7.3	96.1	35.0	-4.6	40.0	31.8
2020-2028	58.1	3.5	5.4	-33.3	-11.3	-49.3	29.2
Grand Total	**32.8**	**71.8**	**77.1**	**53.5**	**44.3**	**44.1**	**60.9**

Table 28. Present value of producer surplus (using 7% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	956	1163	1081	1154	1162	1156	1101	1104
2017-2019	1836	1736	1813	1759	1726	1764	1730	1757
2020-2028	3188	3150	3149	3120	3135	3109	3143	3169
Grand Total	**5979**	**6049**	**6042**	**6034**	**6022**	**6029**	**5974**	**6031**

Table 29. Present value of producer surplus net of status quo values (using 7% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	3. NL+ETA
2015-2016	-145.4	61.5	-20.5	53.0	60.7	54.9	3.3
2017-2019	106.0	5.9	82.8	29.4	-4.4	33.6	26.9
2020-2028	44.5	7.4	6.1	-23.0	-8.4	-33.6	26.2
Grand Total	**5.1**	**74.7**	**68.4**	**59.5**	**47.9**	**54.9**	**56.4**

1.6.2.1.5.4 Present Value of Consumer Surplus

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 are shown in Table 22 (using a 3% discount rate) and Table 24 (using a 7% discount rate), and the cumulative present values net of status quo levels are summarized in Table 23 and Table 25. In the short-term (2015-2016), all alternatives except for ALT3 with 3 closures have a positive impact on the consumer surplus compared to SQ levels. However, over the long-term from 2015 to 2028, the present value of the consumer surplus is estimated to decline compared to the No Action levels (Table 23 and Table 25). This is mainly because No Action would result in slightly higher landings over the long-term compared to all alternatives. All alternatives would result in higher consumer surplus over the long-term compared to SQ values.

Table 30. Present value of consumer surplus (using 3 % discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	70	79	63	76	78	76	73	66
2017-2019	183	157	175	162	155	163	156	162
2020-2028	303	294	295	288	292	286	295	299
Grand Total	**556**	**530**	**533**	**526**	**525**	**524**	**524**	**527**

Table 31. Present value of consumer surplus net of status quo values (using 3% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-2.8	5.7	-10.0	3.1	5.5	2.9	-6.4
2017-2019	26.3	0.8	18.4	5.3	-1.4	6.2	5.6
2020-2028	8.8	-0.2	0.6	-6.1	-2.7	-8.6	4.4
Grand Total	**32.3**	**6.2**	**9.0**	**2.3**	**1.5**	**0.6**	**3.5**

Table 32. Present value of consumer surplus (using 7% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	68	77	62	74	76	74	71	65
2017-2019	164	141	156	145	139	146	140	145
2020-2028	218	212	212	207	210	206	212	216
Grand Total	**450**	**430**	**430**	**426**	**425**	**425**	**423**	**426**

Table 33. Present value of consumer surplus net of status quo values (using 7% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-3.2	5.8	-9.2	3.4	5.6	3.2	-5.8
2017-2019	23.7	0.6	15.8	4.3	-1.3	5.1	4.7
2020-2028	6.8	0.7	0.8	-4.2	-2.0	-5.8	4.1
Grand Total	**27.3**	**7.0**	**7.4**	**3.5**	**2.4**	**2.6**	**2.9**

1.6.2.1.5.5 Present Value of Total Economic Benefits

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. Annual values for the economic benefits are shown in Table 26. The cumulative present value of the total benefits are summarized in Table 35(3% discount rate) and Table 29 (7% discount rate), and the economic benefits net of No Actions levels are shown in Table 28 (3% discount rate) and in Table 38 (7% discount rate).

The short-term (2015-2016) economic benefits for all alternatives are expected to exceed the levels for No Action, and also compared to SQ except that ALT3 with 3 closures would be lower than the total economic benefits for SQ. There are trade-offs between the short-term and the long-term benefits, however, with ALT3 with 3 closures resulting in highest net economic benefits over the long-term from 2015 to 2028 by $78 million compared to SQ and using a 3% discount rate to estimate present values. However, ALT would result in highest economic benefits ($81.7 million) compared to SQ if future benefits weighted less by using a 7% discount rate. This is followed again by ALT3 with 3 closures ($75.8 million) and ALT3 with 2 closures ($62.9 million) using a 7% discount rate and compared to SQ levels (Table 38).

Although the present value of the total revenues and economic benefits for two closures with NL and ETA would exceed the values for three closures respectively by $26.6 million and $25.6 million in 2015-2016, in the next three years from 2017 to 2019, this alternative would result in $70.2 million lower revenue and in $77.2 lower economic benefits compared to the values for three closures (using a 3% discount rate, **Table 39**). If instead the future benefits were discounted at a higher rate, by 7%, the estimated revenues for the 3 closures would exceed the revenues for 2 closures respectively by $61 million and the total economic benefits by $67 million from 2017 to 2019 (**Table 39**).

Table 34. Annual values of total economic benefits (undiscounted, in 2014 inflation adjusted values, Million $)

Sub period	Fishing year	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo (SQ)	3. NL+ETA
2015-2016	2015	248	542	552	555	542	565	460	563
	2016	829	746	632	721	745	711	762	649
2015-2016 Total		**1077**	**1288**	**1183**	**1275**	**1287**	**1277**	**1222**	**1212**
2017-2019	2017	892	819	808	811	818	807	828	803
	2018	808	763	811	767	761	769	759	796
	2019	736	706	789	747	693	755	691	723
2017-2019 Total		**2436**	**2288**	**2407**	**2325**	**2272**	**2332**	**2279**	**2321**
2020-2028	2020	704	697	691	670	669	674	685	694
	2021	688	690	679	663	662	663	679	693
	2022	682	680	670	666	670	668	666	689
	2023	678	669	667	670	675	672	659	685
	2024	675	661	671	679	677	667	662	681
	2025	679	668	677	679	681	663	671	668
	2026	685	672	680	673	681	662	682	663
	2027	686	668	675	664	673	663	689	668
	2028	685	668	672	661	671	668	686	673
2020-2028 Total		**6161**	**6075**	**6082**	**6025**	**6060**	**6000**	**6079**	**6113**
Grand Total		**9674**	**9651**	**9673**	**9625**	**9619**	**9608**	**9579**	**9646**

Table 35. Present value of total economic benefits (using 3% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	Status quo (SQ)	3. NL+ETA
2015-2016	1053.3	1266.2	1165.0	1254.4	1265.2	1255.8	1199.5	1192.9
2017-2019	2234.0	2097.5	2204.0	2129.8	2083.5	2135.8	2089.5	2126.9
2020-2028	4737.4	4673.8	4676.6	4631.1	4656.6	4612.7	4670.6	4704.2
Grand Total	**8024.7**	**8037.5**	**8045.7**	**8015.3**	**8005.3**	**8004.3**	**7959.6**	**8024.0**

Table 36. Net economic benefits net of SQ values (using 3% discount rate, Million $)

Sub Period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-146.2	66.7	-34.5	54.9	65.7	56.3	-6.6
2017-2019	144.5	8.1	114.5	40.3	-6.0	46.3	37.4
2020-2028	66.8	3.2	6.0	-39.5	-14.0	-57.9	33.6
Grand Total	**65.1**	**78.0**	**86.1**	**55.7**	**45.8**	**44.7**	**64.4**

Table 37. Present value of total economic benefits (using 7% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	6. Extra GC with 2 closures	Status quo	3. NL+ETA
2015-2016	1023.2	1239.1	1142.1	1228.2	1238.2	1230.0	1171.8	1169.4
2017-2019	2000.0	1876.8	1969.0	1904.1	1864.7	1909.1	1870.4	1901.9
2020-2028	3405.8	3362.6	3361.4	3327.3	3344.2	3315.2	3354.5	3384.8
Grand Total	**6429.1**	**6478.5**	**6472.5**	**6459.7**	**6447.1**	**6454.2**	**6396.7**	**6456.1**

Table 38. Present value of total economic benefits net of SQ values (using 7% discount rate, Million $)

Sub period	1. No Action	2. Basic Run	3. 3 new closures	3. CA2+NL	4. Reduced F	Extra GC with 2 closures	3. NL+ETA
2015-2016	-148.6	67.3	-29.7	56.4	66.3	58.1	-2.5
2017-2019	129.6	6.4	98.6	33.8	-5.7	38.7	31.6
2020-2028	51.3	8.0	6.9	-27.2	-10.3	-39.4	30.3
Grand Total	**32.3**	**81.7**	**75.8**	**62.9**	**50.3**	**57.5**	**59.4**

Table 39. Comparative benefits of new closures (All dollar values are expressed in 2014 inflation adjusted values and estimated using a 3% discount rate)

Period	3 new closures (CA2+ETA+NLS)	2 new closures (ETA+NLS)	Difference in benefits from 3 closures
	Open area DAS per FT vessel		
2015-2016	64	66	2.0
2017-2019	165	164	-1.0
2020-2028	480	481	1.0
2015-2028	**709**	**711**	**2.0**
	Scallop landings (mill.lb.)		
2015-2016	101.1	103.9	2.8
2017-2019	218.6	209.8	-8.8
2020-2028	530.1	532.9	2.8
2015-2028	**849.8**	**846.6**	**-3.2**
	Present value of scallop revenue ($ million)		
2015-2016	1191.0	1217.7	26.6
2017-2019	2196.8	2126.6	-70.2
2020-2028	4736.0	4761.6	25.6
2015-2028	**8123.9**	**8105.9**	-18.0
	Present value of producer surplus ($ million)		
2015-2016	1102.1	1126.5	24.4
2017-2019	2029.3	1965.0	-64.3
2020-2028	4381.4	4405.2	23.8
2015-2028	**7512.8**	**7496.6**	-16.2
	Present value of total economic benefits ($ million)		
2015-2016	1165.0	1192.9	27.9
2017-2019	2204.0	2126.9	-77.2
2020-2028	4676.6	4704.2	27.6
2015-2028	**8045.7**	**8024.0**	-21.7

1.6.2.2 Allocation of LAGC IFQ trips in access areas

The LAGC IFQ fishery is allocated a fleetwide total number of access area trips. Individual vessels are not required to take trips in specific areas like access area trips allocated to the limited access fishery. Instead, maximum number of trips is identified for each area and once that limit is reached, the area closes to all LAGC IFQ vessels for the remainder of the fishing year.

1.6.2.2.1 Option 1 – No Action – No access area trips allocated for LAGC IFQ vessels

Under No Action (Option 1) LAGC IFQ vessels would not be allocated trips in access areas. Although IFQ catch would come from open areas, the cost of fishing could be higher compared to fishing in access areas which are expected to have a higher stock abundance. In addition, the prohibition of fishing in those areas could also affect the size distribution of landings. 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.

1.6.2.2.2 Option 2 - Allocate fleetwide trips equivalent to 5.5% of catch per access area open to the fishery

This alternative would allocate 5.5% of the access area TAC per area to the LAGC fishery in the form of fleetwide trips. An allocation of 5.5% of that amount is equivalent to 1.05 million pounds, or 1,758 trips with a 600 pound possession limit. This option 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. In short, given that the access areas of the Georges Bank will be closed in 2015 and it could be costlier to fish in some offshore open areas, this option will also help lower fishing costs and could also possibly increase revenues. Therefore Option 2 is expected to have positive economic impacts compared to No Action.

1.6.2.2.3 Option 3 – Allocate fleetwide trips equivalent to 2 million pounds from access areas open to the fishery

This option would increase the overall access LAGC vessels would have to areas that are projected to have more productive fishing areas in 2015, with larger scallops expected in ETA and some other parts of the access areas resulting in higher LPUE in access versus the open areas (See Section? of the Biological Projections). Two million pounds is about 67% of the total LAGC IFQ allocation for 2015 (2.97 million pounds) and is about 10.4% of the total access area catch available in 2015.

The impacts of allocating 2 million lb. to LAGC IFQ fishery in addition to the access area trip allocations for the LA vessel is evaluated with an additional run of the SAMS model. The projections for this run in terms of landings, revenues and total economic benefits were included in Table 9 to Table 38 by removing about an additional million pounds from the access areas in year 1, without adjusting LA allocations to accommodate that increased catch. Overall, this could increase the landings in 2015 to about 47.4 million, but is not expected to have much impact on future landings beyond the next year; 1 million pound increase in year 1 and 1 million pound decrease in year 2. As a result, the impacts of this option on landings and revenues from the scallop fishery over the long-term would be low compared to other LAGC allocation options discussed in this section. However, fishing in more productive access areas with relatively higher LPUEs compared to the open areas, will reduce the trip length and lower trip costs such as for fuel for LAGC-IFQ vessels. The size composition of the catch could also favor larger scallops with a price premium with positive impacts on revenues. Therefore, the economic impacts on the LAGC-IFQ fishery will be positive due to lower costs and higher revenues associated with this flexibility provided to the fishermen to land a major proportion of their quota from access areas if those areas prove to be more productive as projected. However, if the open areas turn out to be more economically optimal for the LAGC-IFQ fleet, they could chose to direct their effort to those areas as well since this option provide such flexibility. In short, this option is expected to have positive economic impacts compared to both No Action and Option 2.

1.6.2.2.4 Option 4 – Allocate fleetwide trips to LAGC vessels in access areas equivalent to the overall proportion of total catch from access areas compared to total catch

This option would provide about the same level of access for LA and LAGC vessels in access areas in 2015 in terms of the total proportion of catch for the year. For example, access area catch is about 41.7% of total catch for FY2015, and if that proportion is applied to the LAGC IFQ that would be about 1.2 million pounds. That allocation is about 6.5% of the total access area catch available in 2015, equivalent to 2,065 trips at 600 pounds each. Option 4 is similar Option 3 above; however, it would have lower positive economic impacts compared to Option 3 since the number of access area trips that would be allocated to the LAGC0-IFQ fishery would be less compared to Option 3. Option 4 would also have positive economic impacts compared to the No Action alternative and greater economic benefits than Option 2 that allocates 5.5% of the access area TAC to the LAGC IFQ fishery.

1.6.3 ALLOCATION METHOD FOR MID-ATLANTIC ACCESS AREA TRIPS in 2015 only

1.6.3.1 No Action (lottery allocation)

Under this alternative 2015 Mid-Atlantic access area trips would be allocated to LA vessels by lottery as in the past years. For 2015, each full-time limited access vessel would receive 3 trips; two allocated to ETA and the third from either HC or Delmarva. The third trip would be allocated by lottery. The third trip lottery split for all three specification alternatives would be 56% of trips to HC, and 44% to Delmarva.

Under No Action, a LA vessel would need to fish in a particular area allocated by lottery. If projections are underestimated stock abundance in an area resulting in lower catch rates, a vessel may need to fish longer to catch the possession limit, which would increase trip costs. If the catch rates continue to fall, in the extreme case, it may even become economically suboptimal to fish in that area. However, vessels can carryover access area trips to the first 60 days of the following year, so if catch rates are low, a vessel can wait to fish remaining catch in March and April of 2016, potentially minimizing any potentially negative economic impacts from low catch rates. Under the lottery alternative each vessel would be allocated two trips in ETA. If the inshore portion of ETA is closed that will concentrate a relatively high level of effort in a rather small area.

1.6.3.2 Flexible allocation for Mid-Atlantic access area trips

The three MA AA areas would be considered one area using their existing boundaries for FY2015. Under this alternative, limited access vessels would receive their total access area allocation in pounds, and that allocation could be fished in any of the MA AAs (and across multiple AAs on a single trip) up to a certain possession limit.

This method of allocation is expected to have positive economic impacts on the scallop vessels in the short-term by providing the flexibility to fish access areas trips in areas with the highest catch rates. Under No Action (Option 1) even if catch rates are lower in the area allocated by lottery, the vessels would still need to fish in that area. The flexibility to fish in areas with highest catch rates will reduce the fishing costs per pound of scallops landed and could increase the revenues as well if the composition of landings include larger scallops with higher prices. This could have slightly positive impacts on the scallop resource and on the economic benefits in the long-term if it helps the fishermen to avoid fishing in less productive areas with smaller scallops. This flexibility may also help spread effort out in 2015, which could have positive impacts on the fishery and resource. The Elephant Trunk area is expected to have the highest concentrations of scallops overall, and with this alternative some vessels may choose to fish in other access areas on their way to and from ETA. For example, a vessel from New Bedford may start fishing in HC and a vessel from VA may start fishing in Delmarva on their way to ETA. This could help reduce overall fishing costs and impacts of concentrated fishing effort.

On the other hand, flexibility could also increase fishing pressure in some areas to a level that could have slightly negative impacts on the resource. In general, if a vessel is fishing in an access area and catch rates decline, the vessel would move to a higher catch area to maximize their profits. However, on access areas trips vessels are not on the clock, so they may decide to continue fishing in a lower catch area for other reasons (i.e. distance from port, etc.). For example, more fishing in inshore parts of ETA or fishing all three trips in this area could increase the F rate and reduce the yield in future years. In addition, this alternative will reduce the monitoring capability since NMFS will not be able to easily track catch by area if this is selected with indirect negative impacts on the fishery. Therefore, this alternative could also have slightly negative impacts on the scallop resource and as a result, negative impacts on landings, revenues and total economic benefits over the long-term.

In conclusion, although the short-term economic impacts of Option 2 are expected to be positive, the long-term economic impacts are uncertain and would range from a slight negative to slight positive impact depending on the fishing behavior.

1.6.4 Adjustments to provisions related to allocating and monitoring access area trips

1.6.4.1 No Action (trip allocations continue and broken trip procedures)

Under this alternative, vessels would continue to be allocated access area trips with associated possession limits, which could actually be taken across multiple trips. For example, if vessels receive 3 trips at 17,000 lb. into the Mid-Atlantic access areas, although they would be allowed to land the entire 51,000 lb. during the fishing year under multiple trips, they would still need to follow current broken trip procedures. This measure does not have direct impacts on the fishery, it is administrative in nature.

1.6.4.2 Remove broken trip process and replace with prelanding reports

If this alternative is adopted, for each trip, vessels would submit a preland through their VMS unit to indicate pounds caught. If a vessel is unable to land a full possession limit on a single

trip, the vessel could go out and fish it on multiple trips without having to submit broken trip reports to request a compensation trip. Because this alternative reduces reporting requirements, it will have slight positive economic impacts on the vessels in the short-term.

1.6.4.2.1 Option 1: Require vessels cross the VMS demarcation line and submit a preland within last 60 days of the fishing year in order to fish those pounds in the first 60 days of the following fishing year.

This option would be status quo -- there is already the potential to carryover all unused access area pounds into the next year, but vessels would still be required to take action (i.e., cross demarcation line and submit a preland or a broken trip form) in the last 60 days that an access area in open in a given fishing year in order to receive the carryover pounds for that area. Needing to cross demarcation does have some associated costs; therefore this activity does have minimal negative impacts on the fishery. However, compared to not being able to rollover access area catch these costs are minimal.

1.6.4.2.2 Option 2: Allow for all unlanded access area pounds to be carried over without any action from vessels

This would be similar to status quo but under this option a vessel would not have to actually go out in their vessel to physically break a trip by crossing the VMS demarcation line. Because this option reduces reporting requirements and allows flexibility to vessels to carry over unlanded pounds without the necessity of breaking a trip in the last 60 days of a fishing year, it could reduce the fishing costs and have low positive economic impacts on the scallop vessels.

1.6.5 Measures to allow fishing in state waters after federal NGOM TAC is reached

1.6.5.1 No Action

Once the federal NGOM hard TAC is reached, all vessels with a federal scallop permit are prohibited from fishing for scallops in the NGOM, INCLUDING state waters. This alternative would continue to prohibit these vessels that have both State and Federal NGOM permits fishing for scallops exclusively in the state waters. Because state water scallop fisheries are primarily active in the winter, there is a chance that the federal TAC could be reached before the state fishery begins.

Since the scallop resource in the state waters is regulated by separate management programs, No Action represents an unnecessary restriction since catch in the state waters doesn't affect the fishing mortality in the NGOM management area. Thus, No Action could have negative economic impacts on those vessels that fish in state waters if they are prohibited to do so if the NGOM hard-TAC is reached. For many vessels the activity in state waters is much higher than activity in federal waters; therefore being prohibited from fishing in state waters if the federal NGOM hard TAC is reached could potentially reduce landings, revenues and total economic benefits for those vessels.

1.6.5.2 All vessels with both a state scallop permit and federal NGOM permit allowed to fish in state waters after the federal TAC is reached

This alternative would allow vessels regardless of whether they have both Federal NGOM and state permit to fish exclusively in state waters for scallops under state water rules. All other vessels with federal scallop permits would be prohibited to fish for scallops in state waters in the NGOM management area after the TAC is reached (LA, LAGC IFQ, and LAGC Incidental).

This measure is not expected to have negative impacts on the scallop resource and future yield in either federal or state waters. Maine and Massachusetts, the only states with active state water scallop fisheries, have management programs in place to control fishing activity in state waters. The state of Maine has a rotational management program with limited fishing seasons of 70 days (50 days in Cobscook Bay) as well as a handful of other input controls. The number of license holders has increased from about 150 in 2008 to about 400 in 2012. In Maine the state water scallop licenses are not linked to a vessel, so as long as the license holder is onboard, any vessel with a federal scallop permit could fish in state waters.

In the state of Massachusetts there are about 160 state water only permits, and about 60 of those also have federal scallop permits. About 10 vessels have both a NGOM permit and a state water scallop permit. The vast majority of state water harvest is by vessels with just a state water permit (90%). Therefore, this alternative would have minimal impacts on most vessels with state water only permits, but would allow those vessels from MA and ME with both state and federal NGOM licenses to fish for scallops after the NGOM federal TAC is reached with positive impacts on the revenues and profits of these vessels.

1.6.5.3 Revise the state water exemption program provisions to allow a state to request a specific exemption related to fishing in state waters after the NGOM TAC is reached

This alternative could be more flexible than the other alternative since it could include other scallop permit types (i.e. incidental, IFQ, etc.) not just the NGOM permit holders. Thus, this alternative could have positive impacts on the revenues of a larger number of scallop vessels if exemption is granted to fish in state waters after the NGOM TAC is reached. For example, in Massachusetts there are only ten vessels with both a federal NGOM permit as well as a state scallop permit, 25 vessels with a federal LAGC IFQ permit as well as a state water scallop permit, and 16 with both a federal incidental and state water scallop permit. In Maine the state water scallop licenses are not linked to a vessel, so as long as the license holder is onboard, the license could be used on any vessel with federal permit. On the other hand, this exemption is not automatic and would need to be approved by NMFS after a review of state's conservation program to make sure this exemption does not jeopardize the biomass and fishing mortality objectives of the Scallop FMP. In general, however, this measure could have higher economic benefits for a larger number of scallop vessels if it is possible to provide the exemption without negatively affecting the scallop resource.

1.6.6 Measures to make turtle regulations consistent

1.6.6.1 No Action

The turtle chain mat requirement and the turtle deflector dredge requirement are two specific measures in place in the Scallop FMP that are designed specifically to reduce mortality on sea turtles. The chain mat regulation is in effect from May 1 through November 30 for any vessel with a sea scallop dredge in waters south of 41°9.0′ N. latitude. The turtle deflector dredge is in effect from May 1 through October 31 for any limited access scallop vessel using a dredge, regardless of dredge size or vessel permit category, or any LAGC IFQ scallop vessel fishing with a dredge with a width of 10.5 ft. (3.2 m) or greater, that is fishing for scallops in waters west of 71° W long. This difference in seasons and area increases regulatory complexity and monitoring costs, thus has slight negative impacts on the total economic benefits from the fishery.

1.6.6.2 Revise season and area for turtle chain mat and turtle deflector dredge to be consistent

Making these regulations consistent is not expected to dramatically change fishing behavior in any way that would have direct impacts on the resource since the overall area is only slightly modified (chain mat area reduced to 71W), and the season is only changed slightly (one month longer for the TDD than before). However, by reducing the regulatory complexity and thus the administrative costs, this alterative is expected to have slightly positive impacts on the overall economic benefits from the fishery.

1.6.7 Measures to develop New Accountability measures for northern windowpane flounder and modify existing accountability measures for GB and SNE/MA yellowtail flounder AM for northern windowpane flounder

1.6.7.1 No Action

Under No Action, the sub-ACL for northern windowpane flounder would not have accountability measures for the scallop fishery, that is, no specific measures would be adopted that would constrain the scallop fishery if the WP sub-ACL were exceeded. Therefore, the No Action would have neutral impacts on the economic benefits from the scallop fishery because it would not result in a change of fishing activity.

1.6.7.2 Reactive AM for northern WP – Seasonal gear restricted area

Probably getting moved to considered and rejected section – do not analyze

1.6.7.2.1 Proactive AM for northern WP – Modify the restriction on the number of rings in apron of dredge

This alternative would modify the current requirement to have at least a seven row apron, and instead require all vessels to have a MAXIMUM of seven rows. This requirement is already in place as a proactive AM for southern WP in open areas west of 71W. If this alternative is adopted that would apply to all other areas as well, Mid-Atlantic access areas, scallop access areas on GB, and open areas east of 71 W as well.

Changing the requirement to a maximum of seven, from a minimum of seven, is expected to reduce bycatch of finfish and small scallops. Currently, the most common configuration includes nine rows of rings, followed by ten and eight. There are some vessels using seven, but the majority of the fleet (about 85%) seems to be using longer aprons. The number of vessels already using five rows is very small, five out of 600 observed vessels in 2013. Therefore, if this AM is implemented the majority of the fleet would need to reduce their aprons. If fewer small scallops are caught with shorter aprons, discard mortality would be lower, having potentially low positive impacts on the resource, scallop yield and long-term economic benefits from the fishery compared to No Action.

Although using a fewer rings could also increase the fishing time and costs, this impact is somewhat limited. The impact of reducing the number of rings on scallop catch is uncertain. Although the vessels could try increasing the number of tows and fish longer, since LA vessels are under DAS in open areas, they cannot increase the fishing time beyond their annual allocation of DAS. On the other hand, LAGC IFQ vessels and LA vessels in access areas are not on DAS, so in theory could fish longer, reducing potential negative impact on scallop landings. Of course, this would also reduce positive impact on the resource from increased escapement of small scallops from shorter aprons. Fishing longer would increase trip costs, reducing the net revenues from scallop fishing. Therefore, the economic impacts of this alternative will depend on the changes in the fishing behavior and on the extent the positive impacts on the scallop resource and long-term economic benefits outweigh the increase in fishing costs. Overall, the

increases in gear and trip costs are expected to be minimal compared to the potential long-term benefits form this measure especially considering that the intent of proactive AMs is to help prevent a fishery from exceeding a sub-ACL. To the extent this gear modification helps achieve that, there could be positive economic impacts from this alternative compared to negative impacts of reactive AMs. In general, reactive AMs can have negative impacts on the fishery if they impose seasonal closures or seasonal restrictions that impact when and where a vessel can fish.

1.6.7.2.2 Proactive AM for northern WP - Eliminate the restriction on the number of rings in apron of dredge

This alternative would eliminate the regulation on number of rings in the apron all together. As a result, this alternative could have low negative to low positive impacts on the resource depending on how many rows vessels decide to fish with. Eliminating the provision would enable vessels to fish with fewer rows if they choose to do so, which could have some beneficial impacts on small scallops, long-term yield and economic benefits. By eliminating the restriction altogether would also allow vessels to fish with seven or more rows in the apron, potentially having negative impacts on the resource if more small scallops are retained in the gear with negative impacts on the long-term yield and economic benefits from the fishery.

So the economic impacts of this measure compared to No Action are unclear depending on whether the vessels will continue using the same gear as before or whether some vessels will choose to fish with less or more than seven rows of rings. The potential economic benefits of this alternative are expected to be less than the alternative that would implement a maximum of seven rows, however, some vessels would prefer to fish with taller aprons and they would be allowed to do that under this alternative. .

1.6.7.3 Modify GB and SNE/MA yellowtail flounder AMs

1.6.7.3.1 No Action

If AMs trigger for the scallop fishery a series of seasonal closure alternatives are potentially implemented based on which component of the scallop fishery caused the overage. There are three different YT AMs in the scallop fishery:
1) one for the LA fleet;
2) one for LAGC IFQ dredge fishery; and
3) one for LAGC IFQ trawl fishery.
The LA fishery has AMs for both GB and SNE/MA YT, but the LAGC IFQ fisheries only have AMs for SNE/MA YT since their catch of GB YT is minimal.

Under No Action, no additional or modified measures would be adopted beyond the current AMs already in place for GB and SNE/MA YT AMs. The potential impacts of these measures were analyzed in previous scallop actions (FW22, FW23, and FW24). In general, the impacts of seasonal area closures are complex because it depends on how vessels react to closures and when and where the effort shifts as a result of a closure. If it shifts to a season or area with lower scallop catch rates, there can be negative impacts on the resource. But closures could also

coincide with poorer meat yield months, which could have beneficial impacts on the resource if effort is prohibited in those seasons.

1.6.7.3.2 Reactive AM for GB YT – Seasonal gear restricted area

Probably getting moved to considered and rejected section – do not analyze
If removed the existing reactive AMs (seasonal closed areas) would remain in place.

1.6.7.3.3 Proactive AM for GB YT – Modify the restriction on the number of rings in apron of dredge

Currently there is a requirement that all scallop dredges have a MINIMUM of seven rows of rings in the apron of the dredge in all areas east of 71 W excluding Mid-Atlantic access areas already as a proactive AM for southern windowpane flounder. This alternative would modify the current requirement to have at least a seven row apron, and instead require all vessels to have a MAXIMUM of seven rows. This would apply to all open areas and access areas, all year long. This is the same alternative as the Alternative for northern windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yellowtail bycatch as well. Therefore, the economic impacts of this alterative would be the same as discussed above for Alternative summarized below;

Changing the requirement to a maximum of seven, from a minimum of seven, is expected to reduce bycatch of finfish and small scallops. Currently, the most common configuration includes nine rows of rings, followed by ten and eight. There are some vessels using seven, but the majority of the fleet (about 85%) seems to be using longer aprons. The number of vessels already using five rows is very small, five out of 600 observed vessels in 2013. Therefore, if this AM is implemented the majority of the fleet would need to reduce their aprons. If fewer small scallops are caught with shorter aprons, discard mortality would be lower, having potentially low positive impacts on the resource, scallop yield and long-term economic benefits from the fishery compared to No Action.

Although using a fewer rings could also increase the fishing time and costs, this impact is somewhat limited. The impact of reducing the number of rings on scallop catch is uncertain. Although the vessels could try increasing the number of tows and fish longer, since LA vessels are under DAS in open areas, they cannot increase the fishing time beyond their annual allocation of DAS. On the other hand, LAGC IFQ vessels and LA vessels in access areas are not on DAS, so in theory could fish longer, reducing potential negative impact on scallop landings. Of course, this would also reduce positive impact on the resource from increased escapement of small scallops from shorter aprons. Fishing longer would increase trip costs, reducing the net revenues from scallop fishing. Therefore, the economic impacts of this alternative will depend on the changes in the fishing behavior and on the extent the positive impacts on the scallop resource and long-term economic benefits outweigh the increase in fishing costs. Overall, the increases in gear and trip costs are expected to be minimal compared to the potential long-term benefits form this measure especially considering that the intent of proactive AMs is to help prevent a fishery from exceeding a sub-ACL. To the extent this gear modification helps achieve that, there could be positive economic impacts from this alternative compared to negative impacts of reactive AMs. In general, reactive AMs can have negative impacts on the fishery if

they impose seasonal closures or seasonal restrictions that impact when and where a vessel can fish.

1.6.7.3.4 Proactive AM for GB YT - Eliminate the restriction on the number of rings in apron of dredge

This alternative would eliminate the regulation on number of rings in the apron all together. This is the same alternative as the Alternative for northern windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yellowtail bycatch as well. Therefore, the economic impacts of this alterative would be the same as discussed above for Alternative for northern windowpane.

This alternative could have low negative to low positive impacts on the resource depending on how many rows vessels decide to fish with. Eliminating the provision would enable vessels to fish with fewer rows if they choose to do so, which could have some beneficial impacts on small scallops, long-term yield and economic benefits. By eliminating the restriction altogether would also allow vessels to fish with seven or more rows in the apron, potentially having negative impacts on the resource if more small scallops are retained in the gear with negative impacts on the long-term yield and economic benefits from the fishery.

So the economic impacts of this measure compared to No Action are unclear depending on whether the vessels will continue using the same gear as before or whether some vessels will choose to fish with less or more than seven rows of rings. The potential economic benefits of this alternative are expected to be less than the alternative that would implement a maximum of seven rows, however, some vessels would prefer to fish with taller aprons and they would be allowed to do that under this alternative.

1.6.7.3.5 Reactive AM for SNE/MA yellowtail flounder – Seasonal gear restricted area

Probably getting moved to considered and rejected section – do not analyze
If removed the existing reactive AMs (seasonal closed areas) would remain in place.

1.6.7.3.6 Proactive AM for SNE/MA YT – Modify the restriction on the number of rings in apron of dredge

This is the same alternative as Alternative for windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yellowtail bycatch as well. Therefore, the economic impacts of this alterative would be the same as discussed above for Alternative for northern windowpane.

Changing the requirement to a maximum of seven, from a minimum of seven, is expected to reduce bycatch of finfish and small scallops. Currently, the most common configuration includes nine rows of rings, followed by ten and eight. There are some vessels using seven, but the majority of the fleet seems to be using longer aprons. The number of vessels already using five rows is very small, five out of 600 observed vessels in 2013. Therefore, if this AM is implemented the majority of the fleet would need to reduce their aprons. If fewer small scallops are caught with shorter aprons, discard mortality would be lower, having potentially low positive

impacts on the resource, scallop yield and long-term economic benefits from the fishery compared to No Action.

Although using a fewer rings could also increase the fishing time and costs, this impact is somewhat limited. The impact of reducing the number of rings on scallop catch is uncertain. Although the vessels could try increasing the number of tows and fish longer, since LA vessels are under DAS in open areas, they cannot increase the fishing time beyond their annual allocation of DAS. On the other hand, LAGC IFQ vessels and LA vessels in access areas are not on DAS, so in theory could fish longer, reducing potential negative impact on scallop landings. Of course, this would also reduce positive impact on the resource from increased escapement of small scallops from shorter aprons. Fishing longer would increase trip costs, reducing the net revenues from scallop fishing. Therefore, the economic impacts of this alternative will depend on the changes in the fishing behavior and on the extent the positive impacts on the scallop resource and long-term economic benefits outweigh the increase in fishing costs. Overall, the increases in gear and trip costs are expected to be minimal compared to the potential long-term benefits form this measure especially considering that the intent of proactive AMs is to help prevent a fishery from exceeding a sub-ACL. To the extent this gear modification helps achieve that, there could be positive economic impacts from this alternative compared to negative impacts of reactive AMs. In general, reactive AMs can have negative impacts on the fishery if they impose seasonal closures or seasonal restrictions that impact when and where a vessel can fish.

1.6.7.3.7 Proactive AM for SNE/MA YT - Eliminate the restriction on the number of rings in apron of dredge

This alternative would eliminate the regulation on number of rings in the apron all together. This is the same alternative as Alternative 0 for northern windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yellowtail bycatch as well. Therefore, the economic impacts of this alterative would be the same as discussed above for Alternative for northern windowpane.

This alternative could have low negative to low positive impacts on the resource depending on how many rows vessels decide to fish with. Eliminating the provision would enable vessels to fish with fewer rows if they choose to do so, which could have some beneficial impacts on small scallops, long-term yield and economic benefits. By eliminating the restriction altogether would also allow vessels to fish with seven or more rows in the apron, potentially having negative impacts on the resource if more small scallops are retained in the gear with negative impacts on the long-term yield and economic benefits from the fishery.

So the economic impacts of this measure compared to No Action are unclear depending on whether the vessels will continue using the same gear as before or whether some vessels will choose to fish with less or more than seven rows of rings. The potential economic benefits of this alternative are expected to be less than the alternative that would implement a maximum of seven rows, however, some vessels would prefer to fish with taller aprons and they would be allowed to do that under this alternative.

1.6.8 Measures to allow a limited access vessel to declare out of fishery on return to homeport

1.6.8.1 No Action

Limited access scallop vessels on an open area DAS trip are charged DAS from the time a vessel positions seaward of the VMS demarcation line until it once again positions shoreward of the demarcation line. However, the current VMS demarcation line results in a higher DAS charge for each trip for the vessels homeported in Virginia and North Carolina due to the longer steaming times to reach the line. In order to prevent steaming time counted as DAS charged, some vessels from those more distant ports choose to land their scallops in New Jersey and ports closer to fishing grounds. When vessels change where they unload product there can be negative impacts on shoreside facilities, especially in ports farther from primary fishing grounds. If vessels decide to steam farther to land product, trip costs will be higher, which can reduce profits for crew from additional costs in fuel etc. If vessels decide to land product closer to primary fishing grounds, trip costs would be lower, and profits could be higher due to shorter steaming times. Under No Action, ports and the shoreside businesses that support them that are closer to primary fishing grounds benefit when additional product is landed there; while other ports that are more distant, or have less activity due to vessels changing behavior, may be impacted negatively under No Action.

1.6.8.2 Implement a separate VMS declaration code to allow vessels to declare out of the fishery at any point (DOF from anywhere)

This alternative would allow a vessel to declare out of the fishery once it crosses the VMS demarcation line at any point (Alternative 2.8.3 – "DOF from anywhere"). If this alternative is adopted an adjustment will be made to DAS allocations for all vessels since the lower DAS charge for vessels from VA/NC will result in higher DAS to land scallops. Currently DAS are allocated to the limited access fishery based on an estimate of projected catch in open areas divided by an estimate of average catch per day for all LA vessels combined. This estimate of catch per DAS uses "DAS charged"; the time between when a vessel crosses the VMS demarcation line on the way out, and the way back.

The estimated gains and loss to vessels from different ports and adjustment to DAS to keep the total fishing mortality constant at the projected levels are shown in Table 40 and distributional economic impacts are shown in Table 41. Under the worst case scenario for this alternative, the open area DAS for all FT limited access vessels has to be reduced by 2.24 days. The gains in DAS charged is estimated to be about 1.51 days for vessels homeported in MA, 2.2 days for vessels homeported in NJ and about 3.99 days for vessels homeported in VA/NC areas if vessels take advantage of this option. The net gains or loss is the difference between the gains in DAS and adjustment to open area DAS allocations. Table 40 shows that vessels from MA will have their DAS reduced on the net by 0.73 days, but the vessels from VA/NC would have an additional 1.74 days, again if they take advantage of this option (see the last column of Table 40, net gain/loss in DAS). For the realistic scenario, adjustment for DAS would be less, about 0.70 days, however, the net gains for the vessels homeported in VA/NC would be higher with a net gain of 2.6 days.

The vessels homeported in MA, or New England states, could incur the largest net loss in their open area days under the worst case scenario with this alternative; estimated revenues per vessel could decline by $22,514 and net revenues by $20,778 (using the projected LPUE and prices for 2015 fishing year). This alternative would have positive economic impacts on the vessels from VA/NC with an estimated increase in revenues per vessel by $53,538 and an increase in net revenues per vessel by $49,410 for the worst case scenario (**Error! Reference source not found.**). Under a more realistic scenario, the loss to the vessels from MA would be slightly lower, but relatively higher from the vessels from NJ since this scenario assumes no gains from DAS charge for NJ vessels. Because the adjustment to total DAS is smaller for this scenario, the net gains for the vessels from VA/NC would be higher ($79,062 in revenue and $72,966 in net revenue per vessel). The last two columns of Table 41 show the changes in total revenue and net revenue for all the vessels by port.

These adjustments would be implemented for both 2015 and 2016 fishing years. Therefore, the distributional impacts from this alternative, that is, the gain in revenues for the vessels homeported in VA/NC and the loss in revenues for vessels homeported in MA and NJ would continue in 2016 fishing year in similar magnitudes. This alternative will continue having distributional impacts on vessels from different ports beyond the 2016 fishing year as well. The changes in the future spatial distribution of resource, and changes in open and access area measures will determine the extent of these long-term impacts compared to the no action VMS declaration system.

1.6.8.3 Implement a separate VMS declaration code for steaming back to port south of Cape May only

Limited access vessels fishing an open area trip could finish their scallop trip by going inside the VMS demarcation line at a specific point, i.e. between Cape Henelopen and Cape May NJ in Delaware Bay, or inside of the VMS demarcation line south of 39 N. This alternative is similar to the previous one, except it would only apply to vessels that intend to land scallops south of Cape May. A vessel would be prohibited from declaring out of the fishery in Cape May, and then transiting to a port north of that area (Alternative 2.8.4).

This alternative is estimated to have smaller economic impacts compared to the above option because it is expected to have impacts only on the vessels homeported in VA and NC. Under the worst case scenario for this alternative, the open area DAS for all FT limited access vessels has to be reduced by 0.40 days and under the realistic scenario, it has to be reduced by 0.14 days. Accordingly, the vessels from VA/NC would have an additional net 1.5 days for the worst case and an additional 1.74 days for the realistic scenario (see the last column of Table 40 net gain/loss in DAS).

The estimated revenues for the vessels homeported in MA and NJ could decline by $12,319 per vessel and net revenues by $11,369 per vessel for the worst case scenario (net of trip costs, using the projected LPUE and prices for 2015 fishing year). This alternative would have positive economic impacts on the vessels from VA/NC with an estimated increase in their revenues by $45,228 and an increase in net revenues by $41,740 per vessel for the worst case scenario (Table 41).

Under the realistic scenario, the loss to the vessels from both MA and NJ would be lower (a decline of $4,420 in revenues and of $4,079 in net revenues, and since adjustment in DAS would decline to 0.20 days. Because the adjustment to total DAS is smaller in this case, the net gains for the vessels from VA/NC would be lower as well compared to Option1 but still higher than compared to the worst case scenario ($53,390 in revenue and $49,274 in net revenue). The last two columns of Table 41 show the changes in total revenue and net revenue for all the vessels by port.

These adjustments would be implemented for both 2015 and 2016 fishing years. Therefore, the distributional impacts from this alternative, that is, the gain in revenues for the vessels homeported in VA/NC and the loss in revenues for vessels homeported in MA and NJ would continue in 2016 fishing year in similar magnitudes. This alternative will continue having distributional impacts on vessels from different ports beyond the 2016 fishing year as well. The changes in the future spatial distribution of resource, and changes in open and access area measures will determine the extent of these long-term impacts compared to the no action VMS declaration system.

Table 40. Adjustment to open area DAS and net gain/loss by homeport

DOF Anywhere	**Region**	**# vessels**	**Total DAS**	**DAS gain per vessel**	**DAS cost per vessel**	**Net gain/loss in DAS**
Worse case	Mass	160	242	1.51	2.24	-0.73
	NJ	97	213	2.20	2.24	-0.05
	VA/NC	70	279	3.99	2.24	1.74
	All vessels	327	734			
Realistic	Mass	160	0	0	0.70	-0.70
	NJ	97	0	0	0.70	-0.70
	VA/NC	70	229	3.27	0.70	2.6
	All vessels	327	229			
DOF Cape May only	**Region**	**# vessels**	**Total DAS**	**DAS gain**	**DAS cost**	**Net gain/loss**
Worse case	Mass	160	0	0	0.40	-0.40
	NJ	97	0	0	0.40	-0.40
	VA/NC	70	131	1.9	0.40	1.5
	All vessels	327	131			
Realistic	Mass	178	0	0	0.14	-0.14
	NJ	124	0	0	0.14	-0.14
	VA/NC	**27**	47	1.9	0.14	1.74
	All vessels	327	65			

Table 41. Distributional economic impacts of the VMS demarcation line alternatives for 2015 fishing year (Assuming LPUE=2500 lb. per Das, price $12.30 and trip costs of $2,371 per DAS)

DOF Anywhere	Region	# vessels	Change in revenue per vessel	Change in costs per vessel	Change in net revenue per vessel	Total change in revenue	Total Change in net revenue
Worse case	Mass	160	(22,514)	-1736	(20,778)	(3,602,170)	(3,324,422)
	NJ	97	(1,500)	-116	(1,384)	(145,475)	(134,258)
	VA/NC	70	53,538	4128	49,410	3,747,644	3,458,680
	All vessels	327				-	-
Realistic	Mass	160	(21,534)	-1660	(19,874)	(3,445,505)	(3,179,837)
	NJ	97	(21,534)	-1660	(19,874)	(2,088,837)	(1,927,776)
	VA/NC	70	79,062	6096	72,966	5,534,342	5,107,612
	All vessels	327				-	-
DOF Cape May only	**Region**	**# vessels**	**Change in revenue per vessel**	**Change in costs per vessel**	**Change in net revenue per vessel**	**Total change in revenue**	**Total Change in net revenue**
Worse case	Mass	160	(12,319)	-950	(11,369)	(1,971,009)	(1,819,033)
	NJ	97	(12,319)	-950	(11,369)	(1,194,924)	(1,102,789)
	VA/NC	70	45,228	3487	41,740	3,165,933	2,921,822
	All vessels	327				-	
Realistic	Mass	178	(4,420)	-341	(4,079)	(786,711)	(726,051)
	NJ	124	(4,420)	-341	(4,079)	(548,046)	(505,788)
	VA/NC	25	53,390	4117	49,274	1,334,757	1,231,840
	All vessels	327				-	-

1.6.9 Modify regulations related to flaring bar provision for turtle deflector dredge

This Action is considering two alternatives: No Action would not change the current provisions related to the flaring bar only being attached to the dredge in one place, as well as an alternative that would clarify that a flaring bar could be attached in more than one place. This measure is administrative and related to safe handling of gear and has no direct impacts on the scallop catch efficiency of the gear and on the economic benefits form the fishery. Therefore, the economic impacts are neutral compared to no action.