DRAFT – PDT still reviewing

1.1 SCALLOP RESOURCE

1.1.1 OVERFISHING LIMIT AND ANNUAL BIOLOGICAL CATCH

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.

1.1.1.1 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 (**Error! Reference source not found.**). The No Action ABC is lower than the proposed ABC in this action because biomass has increased. 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 the scallop resource are neutral.

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

The SSC met on September 15, 2014 to review updated estimates of OFL and ABC for Framework 26. The PDT presented an update of stock status for 2014 as well as updated estimates of OFL and ABC for FY2015 and FY2016. The SSC reviewed the estimates and approved the values prepared by the PDT. The values approved by the SSC are summarized in **Error! Reference source not found.**. 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, these values are based on the most updated information; therefore, using these estimates to set fishery specifications should have positive impacts on the scallop resource because these values are based on the best available science and reduces the risk of overfishing and optimizes overall yield from the fishery.

1.1.2 Fishery specifications

1.1.2.1 Summary of biological projections for overall specification alternatives considered in this action

The biological impacts for the allocation alternatives considered in this action are based on results from an updated version of the SAMS (Scallop Area Management Simulator) model. This model has been used to project abundances and landings to aid management decisions since 1999. SAMS is a size-structured model that forecasts scallop populations in a number of areas. The model was updated this year to include a total of 19 areas, including several new areas that are under consideration in this action (expansion of CA2 south, NL and subdividing ETA). For each alternative 1,000 stochastic runs were completed with the same initial fishery mortality conditions, but various inputs for natural mortality and recruitment were selected for each run. An overall mean of the 1,000 runs is produced for each alternative, as well as percentiles around the mean to help describe the uncertainty of the estimates (i.e. 10^{th} percentile, 25% percentile,

etc). Because natural mortality and future recruitment are relatively uncertain, this has an effect on the projected landings for all scenarios, especially for several years into the future.

It is important to note that this model is based on fishing mortality by area and the inputs are not fishery-based in terms of DAS, etc. The simulation does not model individual vessels or trips; it models the fleet as a whole. The output of the model is then used to eventually compute individual DAS allocations after set-asides, general category landings, etc. are removed. The SAMS model provides projected exploitable biomass estimates, scallop landings, estimates of fishing mortality, average LPUE, DAS used and bottom area swept by area. All of these projections are described in the following tables and figures. Projections are run out 14 years to provide long-term impacts as required by law. After year two, the model uses the same assumptions for allocations in 2016 and beyond. Therefore, the only difference between the overall performances of alternatives is during the first 2 years.

In order to assess the potential impacts of the various specification alternatives under consideration the PDT developed seven separate scenarios. Most of them are actual specification alternatives, and two of them are not. The non-specification alternatives were completed to assess other alternatives in the document. For example, the LAGC scenario (Run6) was developed to assess the potential impacts of allocating more access for LAGC vessels in MA AA in 2015 (2 million pounds). These analyses are for Section ???, not the overall specification alternatives. In addition, the status quo run (Run 7) is not an alternative, but is completed to compare impacts to 2014 allocations (31 DAS and two 13,000 pound access area trips).

The other scenarios evaluate specification alternatives (Runs 1-5); therefore more focus will be on these runs for assessing the potential impacts of the specifications. Runs 3 and 4 both evaluate Specification Alternative 3 – the alternative that considers closing new areas as scallop access areas; Run 3 includes all three closure options and Run 4 only includes two of the three closure options. A description of all seven scenarios is summarized below as well as a table with the model assumptions for fishing mortality rates (Table 1).

- Run 1 – Alternative 1 (No Action)
- Run 2 – Alternative 2 (Base Run)
- Run 3 – Alternative 3 (All 3 closures: CA2, NL and ETA subarea)
- Run 4 – Alternative 3 (Only 2 closures: CA2 and NL extensions only)
- Run 5 – Alternative 4 (Reduced F in MA AA and closing CA2 and NL extensions)
- Run 6 – Increased LAGC effort available in MA AA (2 million pounds)
- Run 7 – Status Quo – FY2014 measures (31 DAS and 2 13,000 pound trips)

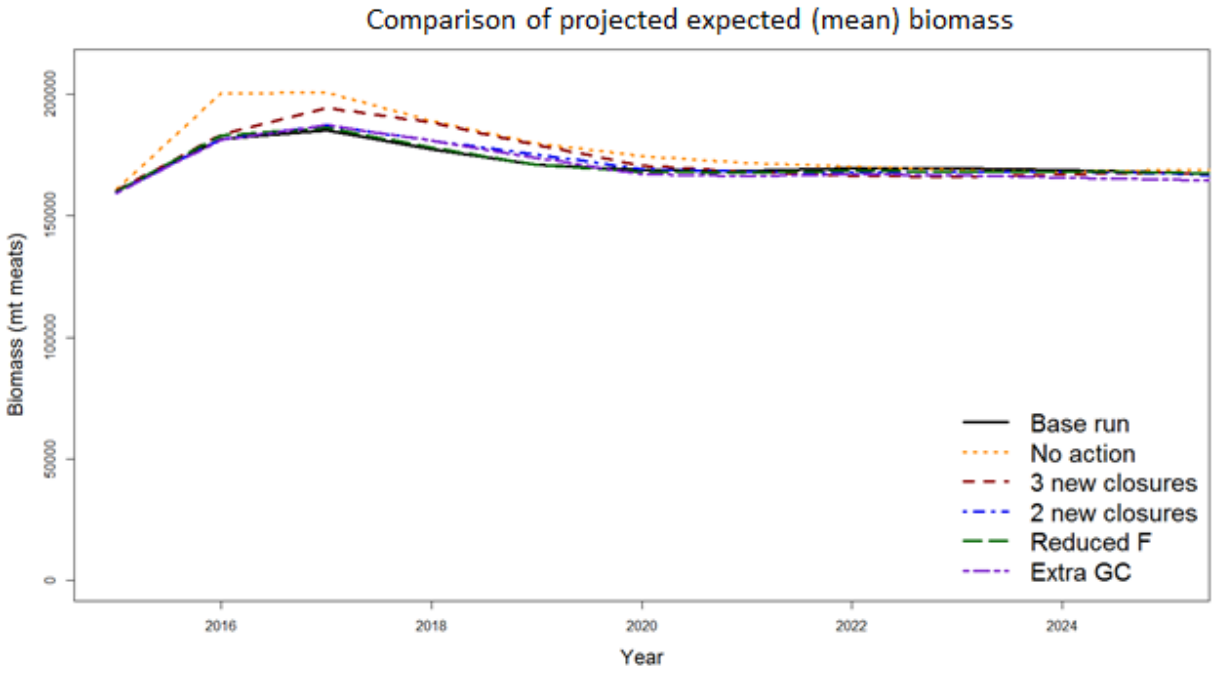
Table 1 – Summary of assumptions used for the various scenarios developed for FW26 analyses

No Action		**2015 F**	**2016 F**	**2017 F**
	Open Areas	0.30	0.48	0.48
	HC	0.00	0.40	0.50
	ETA open	0.00	0.50	0.60
	ETA closed	0.00	0.50	0.60
	Del	0.00	0.40	0.50
Alt 2		**2015 F**	**2016 F**	**2017 F**
Base Run	**Open Areas**	0.48	0.48	0.48
Lottery Allocation	**HC**	0.35	0.40	0.50
	ETA open	0.35	0.50	0.60
	ETA closed	0.35	0.50	0.60
	Del	0.35	0.40	0.50
Alt 3		**2015 F**	**2016 F**	**2017 F**
3 new closures	**Open Areas**	0.48	0.48	0.48
Flexible Allocation	**HC**	0.35	0.40	0.50
	ETA open	0.50	0.50	0.60
	ETA closed	0.00	0.00	0.60
	Del	0.30	0.40	0.50
Alt 3		**2015 F**	**2016 F**	**2017 F**
2 new closures	**Open Areas**	0.48	0.48	0.48
Flexible Allocation	**HC**	0.35	0.40	0.50
	ETA open	0.35	0.50	0.60
	ETA closed	0.35	0.50	0.60
	Del	0.30	0.40	0.50
Alt 4		**2015 F**	**2016 F**	**2017 F**
Reduced F in MA AA	**Open Areas**	0.48	0.48	0.48
2 new closures	**HC**	0.40	0.40	0.50
Lottery Allocation	**ETA open**	0.30	0.50	0.60
	ETA closed	0.30	0.50	0.60
	Del	0.30	0.40	0.50
LAGC		**2015 F**	**2016 F**	**2017 F**
Increase F in MA AA	**Open Areas**	0.48	0.48	0.48
to be 2 mil for LAGC	**HC**	0.37	0.40	0.50
2 new closures	**ETA open**	0.37	0.50	0.60
Flexible Allocation	**ETA closed**	0.37	0.50	0.60
	Del	0.37	0.40	0.50
Status Quo		**2015 F**	**2016 F**	**2017 F**
FY2014 measures	**Open Areas**	0.50	0.48	0.48
31 DAS	**HC**		0.40	0.50
Two 13,000 trips	**ETA open**		0.50	0.60
	ETA closed		0.50	0.60
	Del		0.40	0.50

1.1.2.1.1 Projected total biomass

Overall the projected biomasses for the various runs are very similar (Figure 1). In 2015 the projected biomass is essentially the same for all runs. In 2016 the No Action run has higher biomass because effort levels were so low in 2015. In general, the alternative that closes the inshore area of ETA (Alt 3: 3 new closures) has higher biomass in the middle years compared to other runs that allow access in that area. In the long term there is very little difference in total biomass between the alternatives.

Figure 1 – Comparison of projected total scallop biomass



1.1.2.1.2 Projected landings

Overall the projected landings for the various runs are very similar (Figure 2). In 2015 the projected landings for Alternatives 2 and 4 are 45 million pounds and Alternative 3 is 46 million pounds. No Action is lower, 19 million pounds because it only includes 17 DAS for the LA FT vessels. In 2016 there are larger differences in projected landings based on allocation from 2015. Alternative 3 with 3 closures has lower landings because the inshore part of ETA would still be closed. Alternatives 2 and 4 have higher landings in 2016. After the ETA area opens in 2017 landings are higher for the alternative that closes the ETA area. Overall there are not major differences in landings in either the short term or the long term. It is important to keep in mind that these are mean values, and based on various assumptions for natural mortality and future recruitment, projected landings can vary. Figure 3 shows different percentiles for the 1,000 individual stochastic runs completed for the base run. For example, the mean landigns for the

base run in 2015 is projected to be 45 million pounds (about 20,400 mt). However, excluding the highest 10% and the lowest 10% of the runs, actual catch could reasonably fall between 18-26,00 mt for the base run, or 40-57 million pounds in 2015, and the uncertainty gets larger the farther out the model projects.

Figure 2 – Comparison of projected landings (in mt)

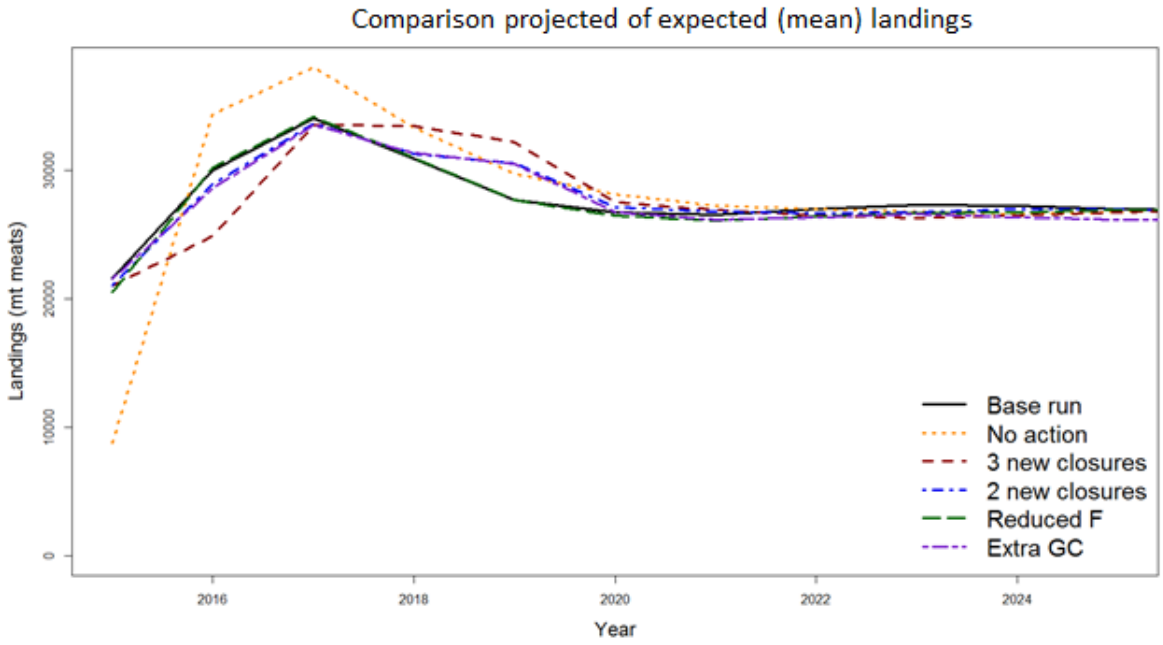
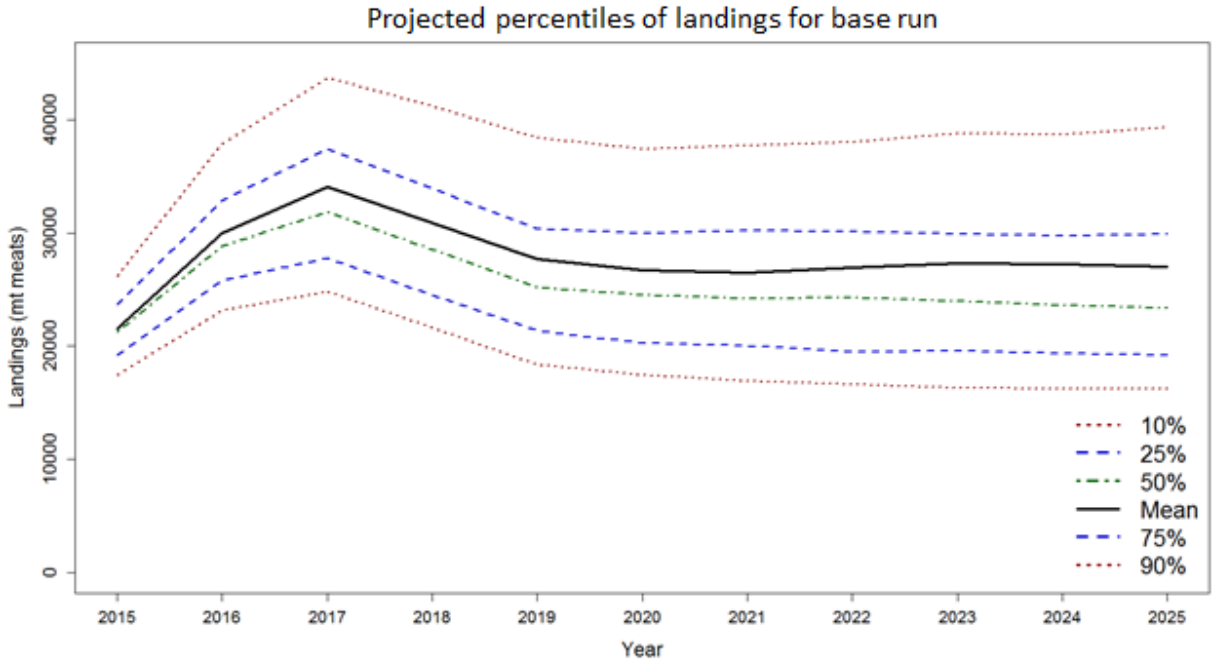


Figure 3 – Comparison of projected landings for base run (with percentiles for all 1,000 runs)



1.1.2.1.3 Projected biomass and landings for ETA only

The results for the base run for just ETA are summarized below broken out by "ETA offshore" and "ETA Inshore" (Table 2). The inshore area is the 7 ten minute square area under consideration for closure in Alternative 3. If the same fishing mortality is applied to both the inshore and offshore areas, the biomass and landings projections for each area are summarized below. Biomass in the inshore area is relatively low in 2014 because most of the scallops are small. As those scallops grow the biomass projections for the area increase greatly from 3,784 mt in 2014 to over 18,000 mt in 2016, with fishing in the area. These increases in biomass and landings from that area may be even higher if fishing is prohibited from the area.

The overall model estimates suggest that closing the area in 2016 and 2017 would yield about 1 million more pounds than just leaving the area open to fishing. One million pounds is a beneficial impact of about 12 million dollars, but for the fishery overall that is not a very large benefit spread over several years. There may be reasons the model is underestimating the benefits of closing the inshore ETA area.

First, the area is relatively small and model results for small areas may not be as pronounced as larger areas. Second, the model is aware of the size selectivity of the 4-inch rings; therefore, the model assumes the majority of small scallops get through the gear if the area is fished. An assumption of incidental mortality is applied, but that may be underestimated if small scallops are in high densities, potentially clogging up gear and experiencing greater impacts. Third, the model assumes that effort within the ETA will be distributed evenly, and that is not how the area will be fished. In the past when MA access areas open the shallow areas are generally fished first; they are closer to shore and scallops grow faster in shallow waters. If effort is higher in the shallow portion of ETA compared to offshore areas the impacts on smaller scallops distributed in the shallow portion of the area may be greater than the model assumes. Finally, closing the ETA area may be more risk averse overall by leaving part of the area closed. Access areas do not always perform as projected and if more flexibility is afforded to vessels to fish trips in any area, the impacts on small scallops in ETA may be greater than the results suggest. All of these factors together may be leading to an underestimate of impacts on small scallops in the inshore part of ETA, thus reducing the potential benefits overall of closing that area to the fishery. This is a one year action and while the projections for Alternative 3 assume a two year closure of the area, it is possible to open the area in 2016 if future surveys suggest the scallops are larger and ready to be fished.

Table 2 – Projected biomass and landings for Elephant Trunk area only (base run – Alternative2)

		BIOMASS		LANDINGS	
Year	F for Base Run	ETA Offshore	ETA Inshore	ETA Offshore	ETA Inshore
2014	0.00	21,344	3,784	0	0
2015	0.35	24,581	11,800	4,256	1,285
2016	0.50	21,478	18,409	4,609	4,313
2017	0.60	17,521	18,806	4,263	5,521
2018	0.60	14,207	15,583	2,950	4,141

1.1.2.1.4 Fishing mortality

- All the alternatives under consideration have a total estimate of fishing mortality considerably lower than the target used to set fishery allocations for the fishery (updated to F=0.32 based on the recent benchmark assessment). The range under consideration is between 0.08 (No Action) and 0.24 for several alternatives, and 0.25 if LAGC effort is increased to 2 million pounds in MA AAs.
- Because there is currently a relatively large amount of total biomass within EFH, GF closed areas, as well as MA access areas, and much of the total biomass is small, the overall F rates are relatively low for the fishery.
- Therefore, the risk of overfishing is relatively low for all of the alternatives under consideration since the projected F rates are well below 0.32. However, the model does tend to underestimate fishing mortality. In recent years when the Scallop PDT has evaluated the projected F rate compared with the actual F rate the following year, total F has been underestimated by 20-30% in some years.

Table 3 – Projected overall F for alternatives under consideration

Average of OverallF		Scenario					
subperiod	Fishing yea	1. No Action	2. Basic Run	3. 3 new closures	4. 2cl	5. Reduced F	6. Extra GC with 2 closure
2015-2016	2015	0.08	0.24	0.21	0.24	0.24	0.25
	2016	0.30	0.29	0.19	0.26	0.29	0.26
2015-2016 Total		**0.19**	**0.26**	**0.20**	**0.25**	**0.26**	**0.26**
2017-2019	2017	0.34	0.33	0.30	0.32	0.33	0.32
	2018	0.32	0.31	0.32	0.31	0.32	0.31
	2019	0.30	0.29	0.34	0.32	0.30	0.33
2017-2019 Total		**0.32**	**0.31**	**0.32**	**0.32**	**0.32**	**0.32**
2020-2028	2020	0.29	0.29	0.30	0.29	0.29	0.29
	2021	0.29	0.29	0.29	0.29	0.29	0.29
	2022	0.29	0.29	0.29	0.29	0.29	0.29
	2023	0.29	0.29	0.29	0.29	0.29	0.29
	2024	0.29	0.29	0.29	0.29	0.29	0.29
	2025	0.29	0.29	0.29	0.29	0.29	0.29
	2026	0.29	0.29	0.29	0.29	0.29	0.29
	2027	0.29	0.29	0.29	0.29	0.29	0.30
	2028	0.30	0.29	0.29	0.29	0.29	0.30
2020-2028 Total		**0.29**	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**
Grand Total		0.28	0.29	0.29	0.29	0.29	0.29

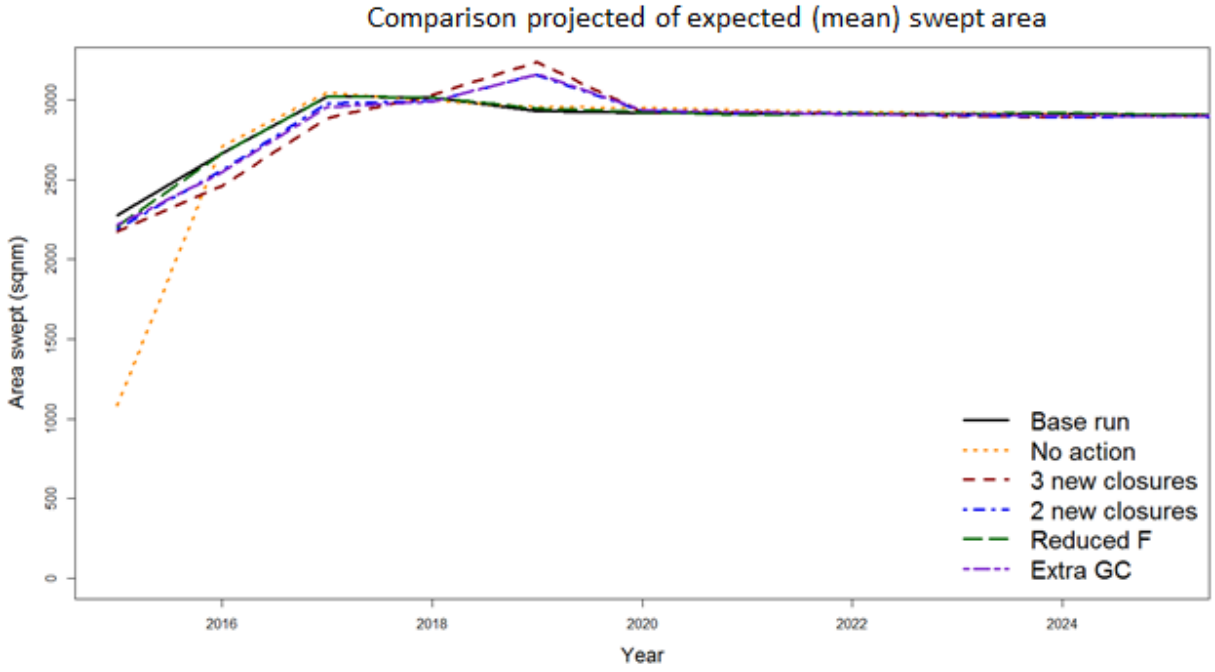
1.1.2.1.5 Projected bottom area swept

- Area swept is an indicator of the level of fishing associated with each alternative; higher area swept values represent higher potential impacts on the resource and associated impacts.
- Overall, all the alternatives have similar total area swept estimates, about 2,200 square nautical miles (Figure 4).
- No Action (Alternative 1) has the lowest estimate of area swept since it does not include any access area effort and greatly reduced DAS (17 DAS for the year).
- Alternative 3 with 3 closures has the lowest area swept in the short term and mid-term years, but the differences are very small.
- It is important to note that while there are small differences between these alternatives in terms of projected area swept, overall all of the alternatives have lower area swept projections than recent years. The range under consideration in this action is about 1,100

square nautical miles for No Action and up to 2,200 for the base run. Framework 25 estimated area swept to be about 2,800 in 2014 and FW24 estimated 2013 measures to have about 4,000 square nautical miles for total area swept. In 2010 values were estimated closer to 5,000; therefore, area swept is declining overall in this fishery under area rotation.

- Therefore, in terms of potential impacts on the environment from scallop fishing including incidental scallop mortality, bycatch of scallops and other species, as well as potential impacts on benthic habitats, all the alternatives under consideration have potentially fewer associated impacts compared to recent fishing years since the estimates of area swept for all alternatives are lower than recent years.

Figure 4 – Comparison of projected area swept



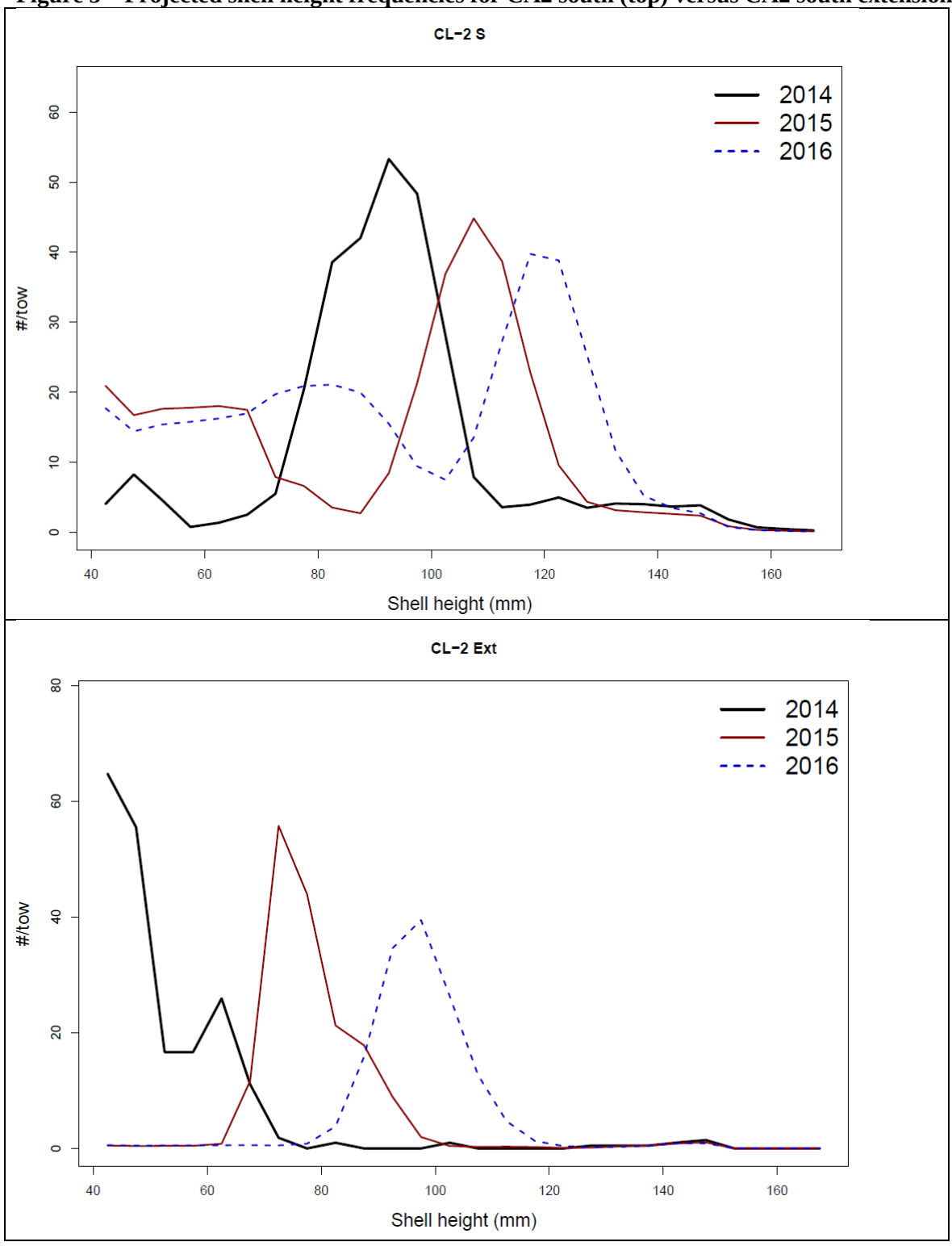
1.1.2.1.6 Projected shell/height frequencies per access area

The Scallop PDT has completed projections of shell height frequencies per area for the next several years to show the composition of scallops in each area based on 2014 survey results and estimated growth, fishing mortality, and natural mortality. The black line in the following figures is the size and frequency of scallops measured in the 2014 survey season, the red line is the projected size and frequency of those scallops for May 2015, and finally the blue dashed line is the projected size and frequency of the same scallops for May 2016. These estimates assumed fishing effort based on Specification Alternative 2, the basic run.

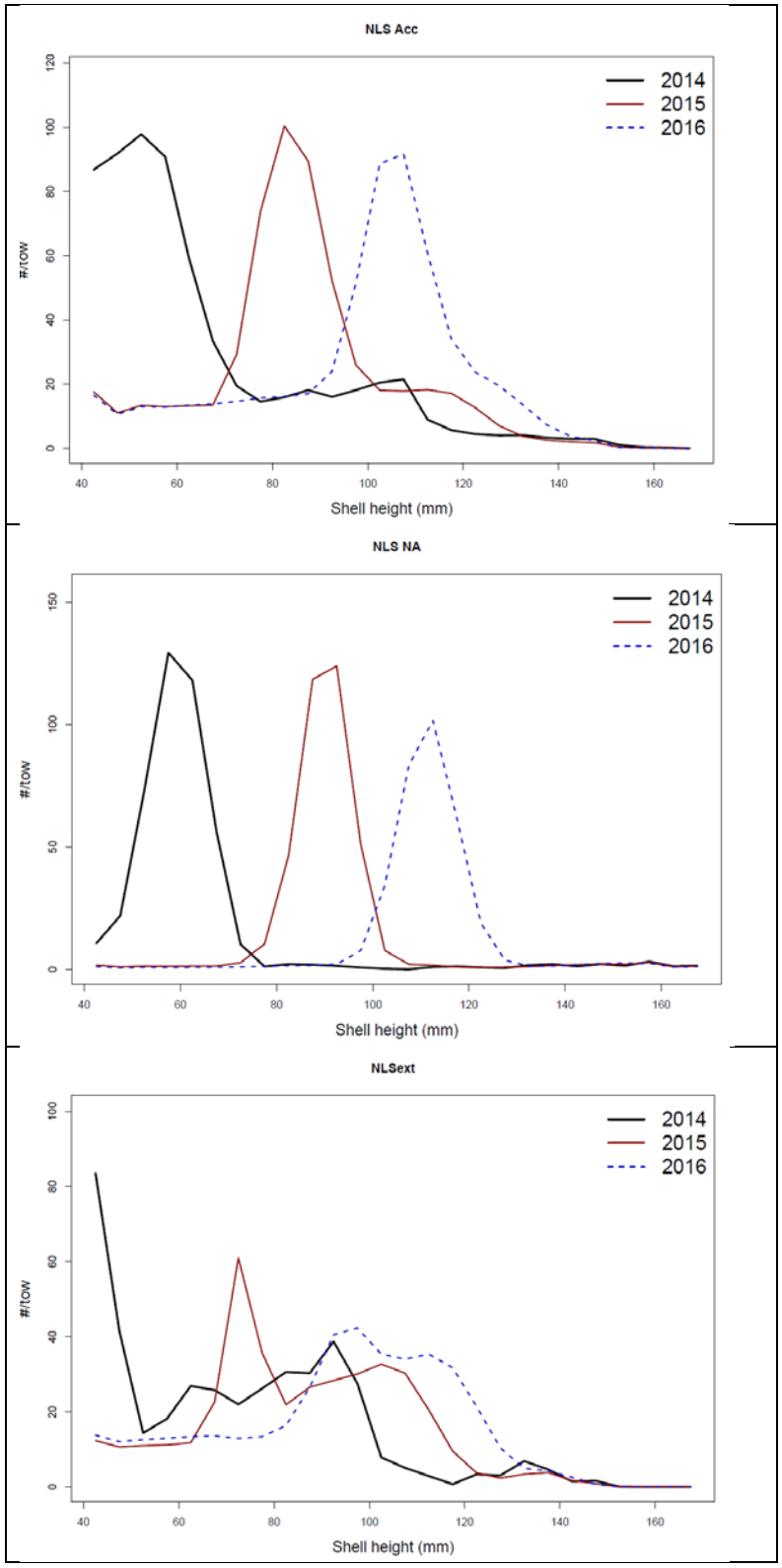
The projected shell height frequencies for scallops in the existing Closed Area 2 south scallop access area as well as the extension under consideration are shown in **Figure 5**. Scallops are larger in the existing access area, and some will be ready for harvest in 2015, but the majority of scallops in that area are projected to be between 100 and 140 mm in 2016. The extended area

has smaller scallops; less than 60 mm now. Those scallops are projected to be about 80mm in 2015.

Figure 5 – Projected shell height frequencies for CA2 south (top) versus CA2 south extension

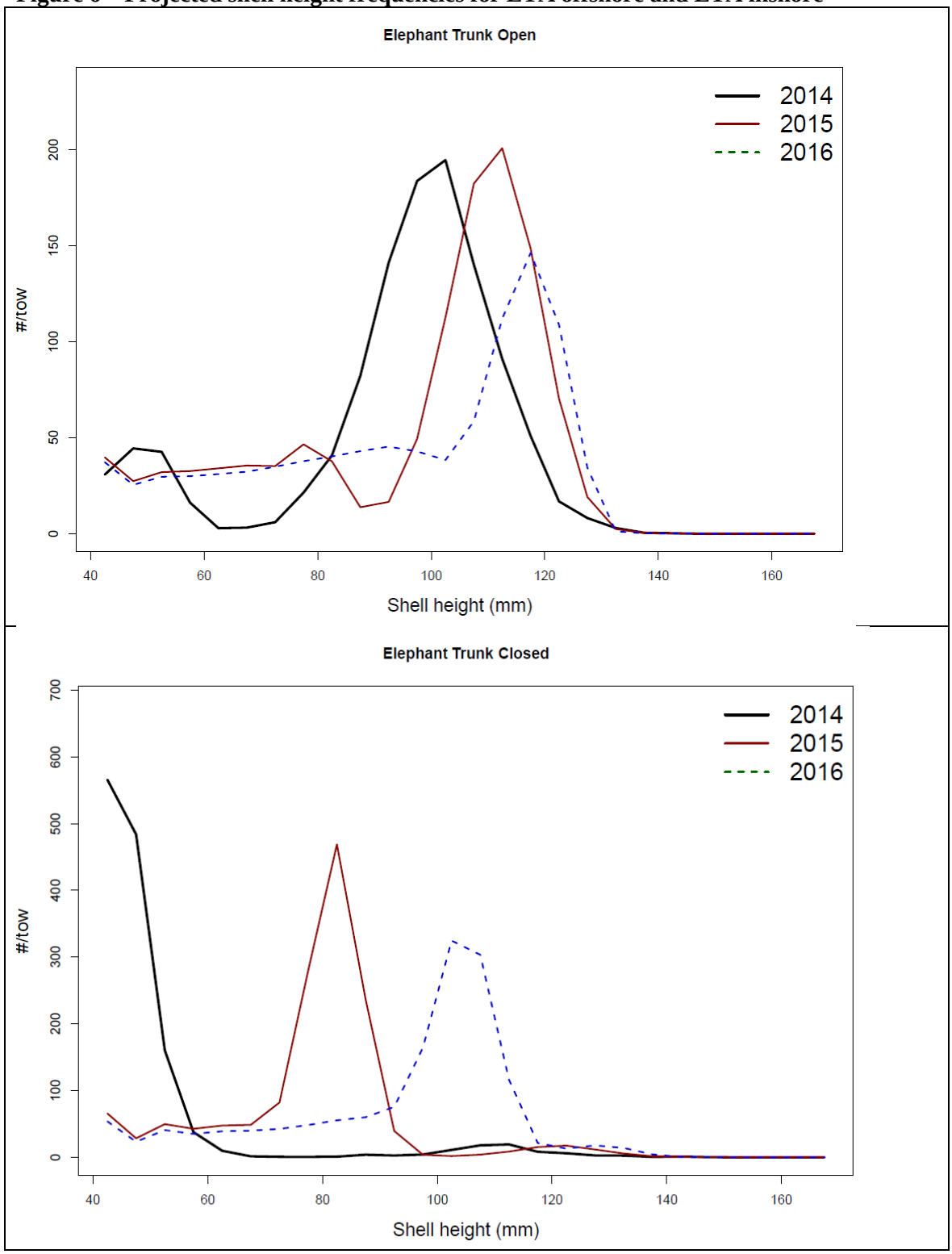


Nantucket Lightship: Current access area, NL closed portion, and potential NL extension



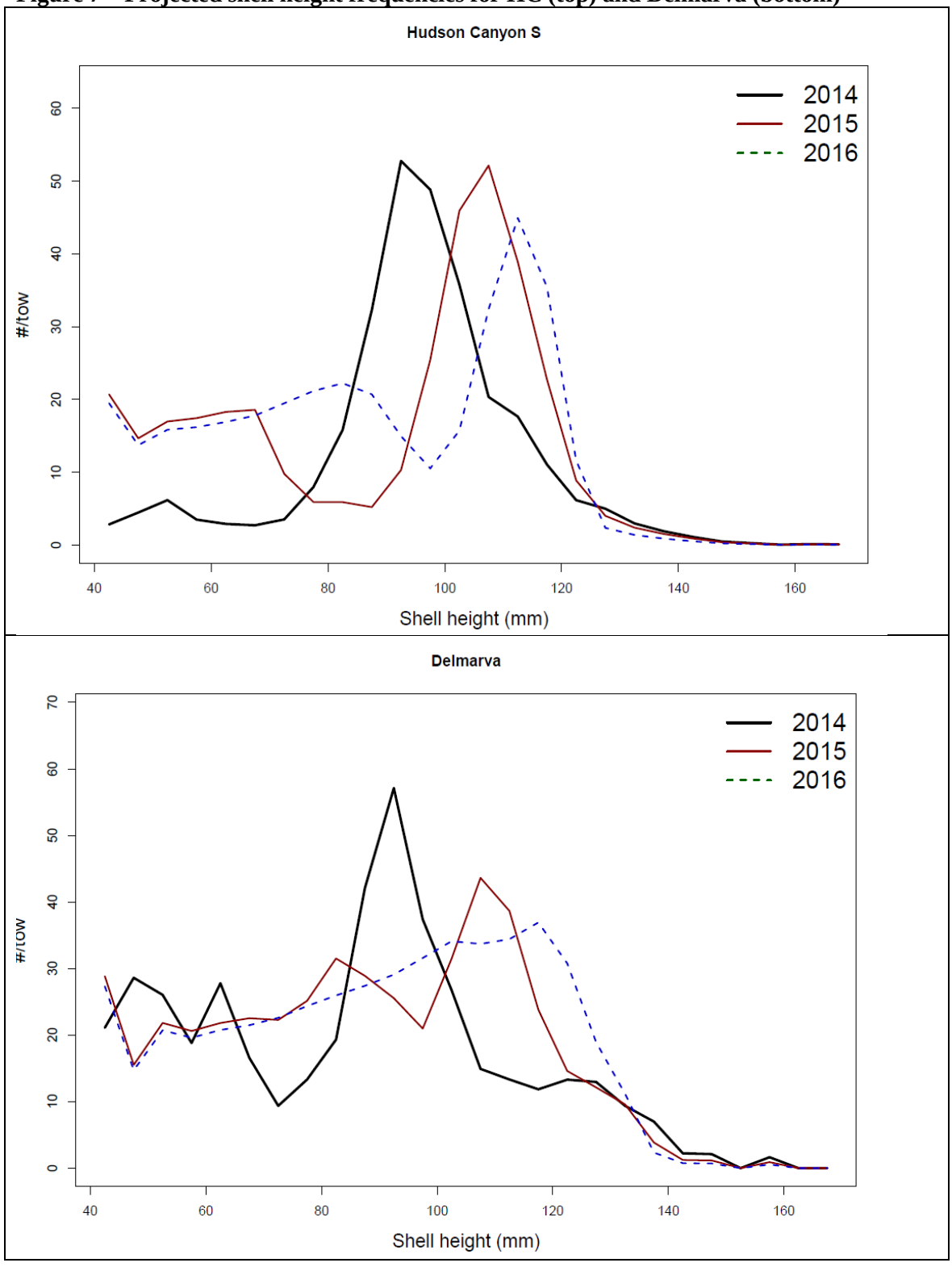
Elephant Trunk – offshore part of ETA (top) and inshore sub area closure (bottom)

Figure 6 – Projected shell height frequencies for ETA offshore and ETA inshore



Hudson Canyon and Delmarva

Figure 7 – Projected shell height frequencies for HC (top) and Delmarva (bottom)



1.1.2.2 Overall fishery allocations

A summary of the various allocation alternatives for the LA fishery are described in Table ??? in the main document.

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

Under No Action, the sub-ACL for the LA fishery would be 21,879 mt (48,234,778 lb). The specifications would include default measures approved in Framework 25 for FY2015 which are 75% of the projected DAS for that year. For full-time vessels that is equivalent to 17 DAS (75% of 23 DAS) and 7 DAS for part-time vessels. There are no access area allocations under No Action. These measures would remain in place until replaced by another action.

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. This allocation is equivalent to 5.5% of the ACL projected for FY2015 from FW25. 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.

The Council recommended very precautionary default measures for the second fishing year in FW25 knowing that this subsequent action would replace the default measures. Since the default measures from FW25 only included 75% of projected DAS and no access area trips, when any of the FW26 specification alternatives are compared to No Action the total landings are higher and therefore would be characterized in this document as having negative impacts to the scallop resource. However, the No Action alternative is not realistic since the intent is to replace those measures with more updated/increased allocations after survey results are available for the following fishing year.

The impacts of the No Action alternative are positive on the scallop resource; estimates of fishing mortality are low under these specifications, thus the risk of overfishing is low (Table 3). Total biomass projections are higher under the No Action alternative in the early years, but in the long run the alternatives have similar biomass estimates (Figure 1).

1.1.2.2.2 Alternative 2 (Specifications based on basic run using fishing mortality target principles in the FMP 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.

Estimates of fishing mortality are low under Alternative 2, thus the risk of overfishing is low (Table 3). Total biomass projections are high under this alternative, and very similar to other alternatives under consideration in this action (Figure 1). The impacts of Alternative 2 on the scallop resource of this alternative are neutral compared to No Action (same DAS but no access area trips). While Alternative 2 includes more access in several access areas, this has a small impact on overall estimates of fishing mortality and biomass projections since the level of effort from these access area trips is low, and a relatively high proportion of total biomass is in areas that are closed to the fishery (GF and EFH closures).

Alternative 2 would have neutral impacts compared to Alternative 3 since these alternatives are very similar in terms of overall projected biomass and fishing mortality, with only one difference about closing additional areas under Alternative 3. Similarly, Alternative 2 would have neutral impacts compared to Alternative 4; the results for projected biomass and fishing mortality are essentially the same for these two alternatives. Since a large proportion of the total biomass is not available to the fishery the impacts on the scallop resource overall are relatively similar for all the alternatives under consideration.

1.1.2.2.3 Alternative 3 (Specifications based on basic run using fishing mortality target principles in the FMP 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.
- 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 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).
- 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.

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 (prohibit access in northwest corner) (2 options considered)

Option 3 is different in that this option proposes to close areas *within* current scallop access areas, or a temporary prohibition to fish in a subset of a current scallop access area. Option 3 is confined to Elephant Trunk. If selected, vessels would be prohibited from transiting through the closure within Elephant Trunk.

The PDT ran two separate model runs to assess the impacts of this alternative. Run 3 included all three closure options, and Run 4 only included two of the three closure options (not the ETA closure). Run 3 with all three areas closed does have the lowest estimate of fishing mortality than all the other runs; for 2015 and 2016 combined it is 0.20, while the other alternatives are 0.25 and 0.26 (Table 3). However, all of the alternatives have relatively low estimates of overall fishing mortality and are well below the fishing mortality target limits of 0.32. Run 3 also has higher estimates of biomass in the short and middle years since ETA was closed for 2 years (Figure 1). But overall since a large proportion of the total biomass is not available to the fishery the impacts on the scallop resource overall are relatively similar for all the alternatives under consideration. Section 1.1.2.1.3 summarizes the potential biomass and landings from just ETA and describes some of possible limitations of the model results when it comes to potential benefits of the ETA closure.

Run 4 does not close ETA and overall the results are very similar to Run 3; except Run 3 estimates about 1 million pounds more catch from the ETA closure overall compared to Run 4 that keeps the area open.

Closing CA2 south extension (Option 1) costs about 1 DAS in 2015 by converting that open area to a closed area. Closing the NL extension area (option 2) does not seem to impact the short term estimates of biomass or landings. The two closures combined increase landings overall by about 3 million pounds, and in the short term the overall fishing mortality estimate for Run4 (2 closures only) is slightly lower than the basic run (Alternative 2) and Alternative 4. But again, overall all the alternatives are expected to have beneficial impacts on the resource since overall estimates of biomass are high for all the runs, and overall fishing mortality estimates are low for all of the alternatives under consideration.

1.1.2.2.4 Alternative 4 (Specifications based on basic run using fishing mortality target principles in the FMP, but reduce fishing mortality target for MA access areas lower than allowable limits to reduce incidental mortality on small scallops in those 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.
- 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 catch for Alternative 4 is about 45 million pounds (including set-asides and LAGC catch).
- 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.

Estimates of fishing mortality are low under Alternative 4, thus the risk of overfishing is low (Table 3). Total biomass projections are high under this alternative, and very similar to other alternatives under consideration in this action (Figure 1). The impacts of Alternative 4 on the scallop resource of this alternative are neutral compared to No Action (same DAS but no access area trips). While Alternative 4 includes more access in several access areas, this has a small impact on overall estimates of fishing mortality and biomass projections since the level of effort from these access area trips is low, and a relatively high proportion of total biomass is in areas that are closed to the fishery (GF and EFH closures).

Alternative 4 has essentially the same potential impacts as Alternative 2 since the results of projected biomass and fishing mortality are essentially the same. Compared to Alternative 3 the impacts on the resource may not be as beneficial in the short term since fishing mortality estimates are slightly higher under Alternative 4 than Alternative 3, but overall the impacts are low since fishing mortality estimates are well below the limits allowed under the FMP.

1.1.2.3 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.

This action is considering four options for allocating fleetwide trips to the LAGC IFQ fishery. Option 1 is No Action; LAGC IFQ trips will not be allocated in any of the scallop access areas in 2015 or 2016 (default). Under Option 2 the LAGC fishery would be allocated 5.5% of the total 2015 access area TAC for every area open in a particular year. In 2015, an allocation of 5.5% of access area landings is equivalent to 1.05 million pounds, or 1,758 trips with a 600 pound possession limit. Option 3 would allocate 2 million pounds to the LAGC fishery from access areas, increasing the overall access LAGC vessels would have to areas that are projected to have more productive fishing areas in 2015. Two million pounds is about 67% of the total LAGC IFQ

allocation for 2015 (2.97 million pounds). Two million pounds for the LAGC fishery is about 10.4% of the total access area catch available in 2015, and that allocation is equivalent to 3,333 trips with a 600 pound possession limit. Finally, Option 4 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 FY2017, and if that proportion is applied to the LAGC IFQ that would be about 1.2 million pounds, 41.7% of the total LAGC IFQ for 2015 (2.97 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.

If trips are not taken in these areas, LAGC catch is assumed to be taken in open areas instead. In some cases, catch rates are higher in access areas so it may take longer for a LAGC vessel to fish for IFQ in open areas; however, in other cases catch rates can be higher in some open areas compared to access areas. 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.

Under No Action (Option 1) LAGC IFQ vessels would not be allocated trips in access areas. Therefore all IFQ catch would come from open areas. Since the overall allocation of LAGC IFQ is a relatively small proportion of total scallop catch the location of effort does not have a major impact on the resource. Thus, impacts of No Action are neutral on the scallop resource. Option 2 would allocate 5.5% of each area TAC to the LAGC IFQ fishery in fleetwide trips per access area. In theory this option would have low positive impacts on the resource compared to No Action because LAGC IFQ effort would be distributed over more areas and not all in open areas. However, these trips are voluntary, and even if LAGC IFQ trips are available in an access area the fleet may fish in open areas instead. Therefore, the impacts of this measure are generally neutral compared to No Action.

Option 3 allocates 2 million pounds to LAGC vessels in access areas, on top of the scheduled allocation for LA vessels in access areas. The PDT ran a SAMS run for this to evaluate the effects of removing about an additional million pounds from the access areas in year 1, without adjusting LA allocations to accommodate that increased catch. Overall the results suggest that the impacts on the resource are minimal. Overall fishing mortality for 2015 does increase from 0.24 to 0.25 when comparing Alternative 3 with 2 closures and Run 6 (increased LAGC catch with Alternative 3 and 2 closures). That increase in F is temporary and does not seem to impact future catches or mortality estimates beyond the next year; 1 million pound increase in year 1 and 1 million pound decrease in year 2. Furthermore, because these trips are voluntary, the fleet may fish more in access areas and less in open areas, and they may not if catch rates are not substantially different. Ultimately, since the overall LAGC catch in access areas is a small percentage of the overall catch the spatial impacts of removing that catch in one area and not another are minimal. Therefore, the impacts of this measure on the resource are generally neutral compared to No Action.

Option 4 would provide more access for LAGC vessels compared to Option 1 and 2, but less than Option 3. Again, since the overall LAGC catch in access areas is a small percentage of the overall catch the spatial impacts of removing that catch in one area and not another are minimal.

Therefore, the impacts of this measure on the resource are generally neutral compared to No Action

1.1.2.4 Additional measures to reduce impacts on small scallops

This action is considering two options for this issue. Option 1 (No Action) would maintain that access areas not have a crew limit. Option 2 would implement the same crew limits that exist for open areas: 7 individuals per LA vessel, and if a vessel is participating in the small dredge program it may not have more than five people on board.

Since the MA access areas have relatively high concentrations of small scallops Option 2 would help reduce the potential for highgrading. Compared to No Action this measure could have low positive impacts on the scallop resource in MA AAs by limiting the overall number of crew. Crew limits have been eliminated for scallop access area trips since there is a possession limit controlling effort in access areas, but if scallops are generally smaller an additional crew member or two could increase the potential mortality from that area if vessels decide not to target larger scallops and instead cut more scallops to attain the same possession limit. If Option 2 reduces the incentive for highgrading, which increases mortality, it could have low positive impacts on the resource compared to No Action.

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

1.1.3.1 No Action (lottery allocation)

Under this alternative 2015 Mid-Atlantic access area trips would be allocated to LA vessels similar to how trips have been allocated in the past. 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 lottery for the third trip would not be split 50/50 between the two areas. The projected biomass is higher for HC compared to Delmarva, so more trips would be allocated to HC. The third trip lottery split for all three specification alternatives would be 56% of trips to HC, and 44% to Delmarva.

This method of allocation is expected to have neutral impacts on the resource. Trips would be allocated and distributed based on projected biomass results. Under this alternative a LA vessel would need to fish in a particular area. If projections are underestimated a vessel may need to fish longer to attain the possession limit, which can have negative impacts on the resource if catch rates fall very low. 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 negative impacts on the resource from fishing areas with lower catch rates.

1.1.3.2 Flexible allocation for Mid-Atlantic access area trips

The three MA AA areas would be considered one area using their existing boundaries for FY2015. Vessels would declare a MA AA 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 AAs (and across multiple AAs on a single trip) up to a certain possession limit.

This method of allocation is expected to have slight positive to slight negative impacts on the resource and depends on fishing behavior. Impacts may be positive if vessels are given flexibility to fish access areas trips if they decide to fish those trips in areas with the highest catch rates. Arguably if a vessel is allocated a trip by lottery that has lower catch rates than another area, it would still need to fish in that area under Option 1. Under this option the vessel could chose to fish that trip in a different area, with potentially higher catch rates. Biomass projections are uncertain and if catch rates are underestimated for a particular area, it could take a vessel longer to harvest their allocation, having potentially negative impacts on the resource.

On the other hand, flexibility could also increase fishing pressure in some areas to a level that could have negative impacts on the resource. Potential impacts of this alternative may be more uncertain because there is less control on where vessels fish. In theory if a vessel is fishing in an access area and catch rates drop off the vessel would move to a higher catch area. 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). This can have negative impacts on the resource if vessels decide to fish in lower catch areas for other reasons.

For example, in 2015 the area with the highest concentration of exploitable scallops is the deeper water portion of ETA. If all three access areas have flexible boundaries vessels may start fishing access area trips when they entire the larger access area (northern part of HC for vessels from New England, inshore ETA for vessels from NJ, and Delmarva for vessels from southern ports). This could spread effort out, but could also increase fishing pressure in other areas. For example, more fishing in inshore parts of ETA could have negative impacts on small scallops in that area. Vessels are not on the clock in access areas, so while it seems that vessels would move if catch rates fall, some may not having potential impacts. In an extreme example, what if all vessels fished all three trips in ETA. That is not probable, but f rates could be higher in that area than projected. High fishing mortality in the first year of an opening can have negative impacts on the overall yield from an access area. Finally, impacts may be more uncertain from this alternative if there is reduced ability to monitor where catch is coming from.

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

1.1.4.1 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.

1.1.4.2 Remove broken trip process and replace with prelanding reports

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 that can actually be fully harvested under multiple trips. For example, in a given fishing year, a vessel receives a17,000 lb allocation in Delmarva and a 34,000 lb allocation in Elephant Trunk, which can be harvested on multiple trips, but trips would have a possession limit of 17,000 lb. Trip exchanges would still occur, but a vessel would only exchange a full-possession limit between areas. Notice that none

of this changes in any way how the fishery currently operates, but it is using terminology that is more in line with how the fishery actually functions.

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.

1.1.4.2.1 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.

1.1.4.2.2 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 because there is already the potential to carryover all unused access area pounds into the next year, but vessels would no longer be required to break a trip in the last 60 days of a fishing year. 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.

Preliminary Input from NMFS regarding "Monitoring the Megatron" – For PDT Discussion

- If the Council selects the most flexible option, where dealer-reported landings can no longer be matched to area-specific trip declarations, you will give up some level of specificity in monitoring. This is the trade-off for the added flexibility that this alternative brings. With our current reporting forms and the loss of an area specific VMS declaration, we would have a hard time monitoring landings by current area delineations under this alternative.
- The most accurate monitoring would be to monitor dealer-reported landings from all three areas combined. Rather than three separate access areas, the monitoring page would report landings from one general area called "Mid-Atlantic access areas."
- There are two other options for monitoring a "megatron" with our current information streams, and neither would result in accurate information:
- One option is for vessels to make an area-specific declaration of where they anticipate their primary fishing to occur, and all dealer-reported landings would go towards the declared area. This will be an estimate – some vessels will fish in more than one access area, and some ultimately may not fish in the area they declared – but this would be more accurate and accountable than catch report/VTR matching.
- Using the current catch reports and matching to VTRs is technically possible, but would produce questionable information. Major reasons for this are summarized below.
    - Statistical areas cannot be matched to a single access area. Each Mid-Atlantic Access Area covers at least 2 statistical areas (HC includes 3), and they encompass the same statistical areas. VTRs each have a single stat area. It is easily possible that fishing could occur in two access areas and only one Stat area.
    - Catch reports occur daily and require entry of a single VTR serial code. VTRs are required with entry to a new statistical area, making matching based on catch reports unreliable for spatial purposes. It is possible that you could cross multiple statistical areas during one trip (resulting in multiple VTRs and Lat/Long's)
    - Lat/Long do not always match the statistical area on the VTR.
    - A single Lat/Long point on a VTR does not tell you where the fishing actually occurred, only the general area. This exacerbates the issue of boundaries not lining up.
    - There would be a delay in matching VTRs with catch reports, due to the timing differences in when these different reports are due.

The Committee could recommend that the catch reports be expanded to include access area reporting (i.e., vessels would need to report estimated pounds landed by access area), but due to current VMS funding constraints, the Agency cannot guarantee that these changes could be made in time. In addition, this would involve Paperwork Reduction Act measures that could slow down implementation of the Framework.

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

1.1.5.1 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.

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

If the federal NGOM hard TAC is reached and the area is closed, but a vessel has both a federal NGOM permit and a state water scallop permit, that vessel would be permitted 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).

In general this alternative should have neutral impacts on the resource compared to No Action. The federal NGOM hard-TAC is set based on somewhat limited surveys of the federal resource only. This measure is primarily about access to the state water fishery. The current regulations prevent a vessel with a federal permit to fish in state waters if the federal TAC is reached. Since 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.

The only states with active state water scallop fisheries are Maine and Massachusetts. Both states have management programs in place to control fishing activity in state waters. Therefore, allowing vessels with federal permits to fish in state waters even if the federal TAC is caught should not have any additional impacts on the resource in either federal or state waters. The hard-TAC in federal waters would still control overall removals from federal waters, and individual states have measures in place to restrict fishing in state waters. For example, 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. The scallop fishing licenses are not owner operator; the permit holder just needs to be on board during fishing operations. The license holder does not have to declare a vessel at the time the license is being issued. Therefore, any vessel with a federal scallop permit could fish in state waters if a licensed individual is onboard.

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 either way since only about 10 vessels would be able to fish in state waters after the NGOM federal TAC is reached. In the last few years the state implemented scallop management measures to constrain daily catches and implement gear restrictions to be more consistent with the federal NGOM program. Therefore, state water fishing is constrained in both MA and ME by state water programs; so the impacts on the resource from this alternative should be neutral.

1.1.5.3 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

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.

The potential impacts of this alternative on the resource are likely neutral compared to No Action as well as the other alternative under consideration. This measure in and of itself would not have any direct impacts since it would only add a provision to list of measures that state water fisheries can be exempt from. This alternative may be more flexible than the other alternative under consideration that is constrained to just federal NGOM permit holders. This alternative may include other scallop permit types (i.e. incidental, IFQ, etc). 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.

It is important to note with this alternative that before anything is approved an individual state would need to request an exemption directly to NMFS and it would need to be approved. If a state requests an exemption the Regional Administrator shall review the changes and determine if the state's conservation program does not jeopardize the biomass and fishing mortality objectives of the Scallop FMP.

1.1.6 Measures to make turtle regulations consistent

1.1.6.1 No Action

There are two specific measures in place in the Scallop FMP that are designed specifically to reduce mortality on sea turtles; the turtle chain mat requirement and the turtle deflector dredge requirement. 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. The action is considering No Action which would keep these measures as they are, and an alternative to make the seasons and areas consistent.

Both of the alternatives under consideration are expected to have neutral impacts on the resource. The measure to make these regulations consistent was developed primarily to reduce regulatory complexity; therefore, it is administrative in nature. Both measures will still be in place to reduce impacts on turtles in the same overall area and season. 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).

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

1.1.7.1 AM for northern windowpane flounder

1.1.7.1.1 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. Under No Action, 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 scallop resource because it would not alter fishing activity.

1.1.7.1.2 Reactive AM for northern WP – Seasonal gear restricted area

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

1.1.7.1.3 Proactive AM for northern WP – 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. Framework 25 modified this outdated regulation for all waters west of 71W, excluding Mid-Atlantic access areas, already as a proactive AM for southern windowpane flounder, but the requirement to have a minimum 7-ring apron still exists for all other areas.

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. As noted, 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, would enable vessels to fish with fewer rings and a larger twine top. A larger twine top reduces bycatch of finfish and small scallops. There may be beneficial impacts on the scallop resource from this measure since fewer rows of rings increases the escapement of small scallops and does not cause too many large scallops to escape, which would require vessels to fish longer (**Table 4**).

Increased fishing time to compensate for any potential loss in scallop catch is somewhat limited, at least for LA vessels fishing in open areas. Since LA vessels are under DAS in open areas vessels cannot increase the fishing time beyond their annual allocation of DAS. If fewer small scallops are caught with shorter aprons, discard mortality would be lower, having potentially low

positive impacts on the resource compared to No Action. These potential benefits may be limited compared to current fishing practices because many vessels already fish with seven rows in the apron of the dredge. Furthermore, LAGC IFQ vessels and LA vessels in access areas are not on DAS, so in theory could fish longer, negating any potential positive impact on the resource from increased escapement of small scallops from shorter aprons.

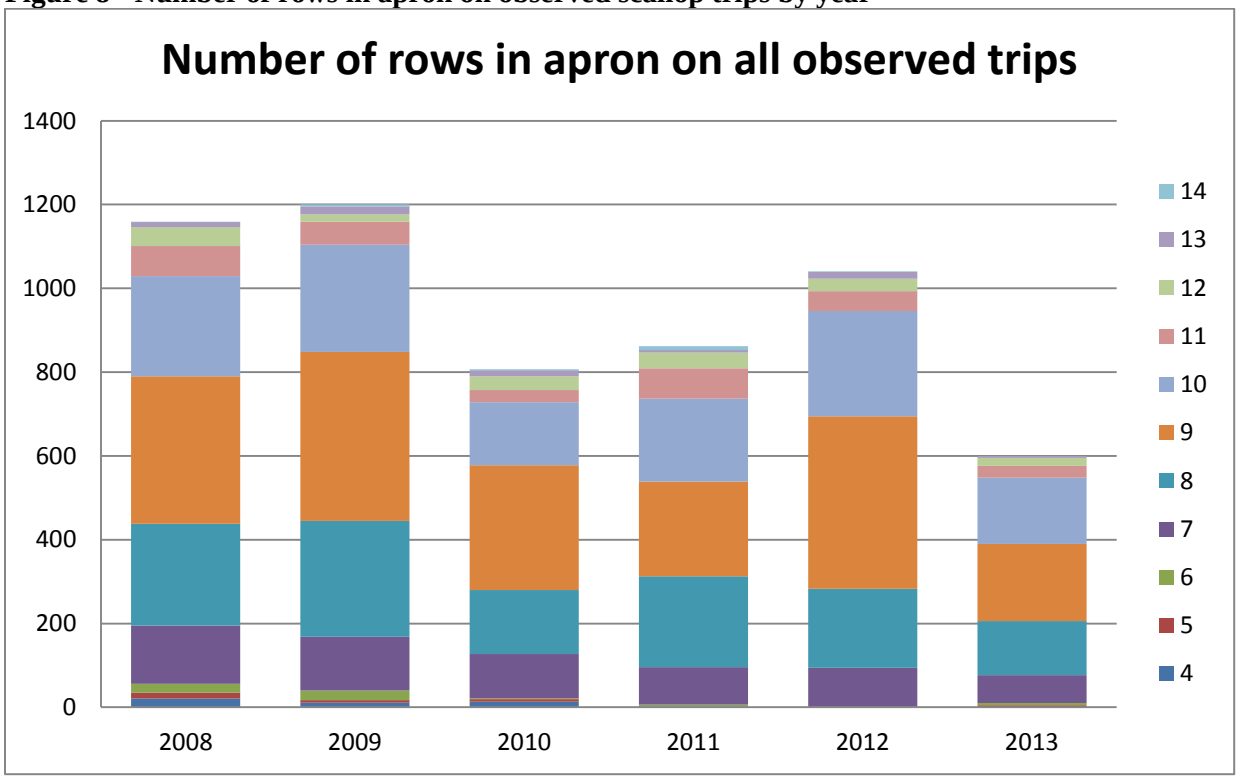
However, adopting this measure would prevent vessels from fishing with more than seven rows, and enable vessels to fish with fewer rows than seven voluntarily. Fewer rows (i.e. five rows of rings) have been found to reduce bycatch, but fewer than seven is currently prohibited in the regulations. If some vessels decide to fish with fewer than seven rows as a result of this proactive AM that may reduce impacts on scallop mortality since results suggest that dredges with fewer rings are more selective for larger scallops, and catch fewer small scallops.

Table 4 and **Figure 8** 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 4 – 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 8 - Number of rows in apron on observed scallop trips by year



1.1.7.1.4 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. A vessel could fish with any number of rings in the apron of the dredge. Eliminating the restriction may have more conservation benefit for flatfish compared to No Action, which requires vessels to fish with a minimum of seven, if vessels choose to fish with seven or less rows of rings. However, simply eliminating the restriction could enable a vessel to fish with as many rows as they want (i.e. more than seven). So compared to No Action this may have some benefit for flatfish for vessels that choose to fish with less than currently allowed (minimum of seven rows), but not as much potential benefit as the option that would implement a maximum of seven rows (Alternative 1.1.7.1.3).

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, which could have some beneficial impacts on small scallops, but it would not require it. By simply eliminating it vessels could also 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.

1.1.7.2 Modify GB and SNE/MA yellowtail flounder AMs

1.1.7.2.1 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 resrouce if effort is prohibited in those seasons.

1.1.7.2.2 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.

1.1.7.2.3 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. Framework 25 modified this outdated regulation for all waters west of 71W excluding Mid-Atlantic access areas already as a proactive AM for southern windowpane flounder, but the requirement to have a minimum 7-ring apron still exists for all other areas.

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. <u>This is the same alternative as Alternative 1.1.7.1.3 for northern windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yt bycatch as well.</u>

Changing the requirement to a maximum of seven, from a minimum of seven, would enable vessels to fish with fewer rings and a larger twine top. A larger twine top reduces bycatch of finfish and small scallops. There may be beneficial impacts on the scallop resource from this measure since fewer rows of rings increases the escapement of small scallops and does not cause too many large scallops to escape, which would require vessels to fish longer (**Table 4**).

Increased fishing time to compensate for any potential loss in scallop catch is somewhat limited, at least for LA vessels fishing in open areas. Since LA vessels are under DAS in open areas vessels cannot increase the fishing time beyond their annual allocation of DAS. If fewer small scallops are caught with shorter aprons, discard mortality would be lower, having potentially low positive impacts on the resource compared to No Action. These potential benefits may be limited compared to current fishing practices because many vessels already fish with seven rows in the apron of the dredge. Furthermore, LAGC IFQ vessels and LA vessels in access areas are not on DAS, so in theory could fish longer, negating any potential positive impact on the resource from increased escapement of small scallops from shorter aprons.

However, adopting this measure would prevent vessels from fishing with more than seven rows, and enable vessels to fish with fewer rows than seven voluntarily. Fewer rows (i.e. five rows of rings) have been found to reduce bycatch, but fewer than seven is currently prohibited in the regulations. If some vessels decide to fish with fewer than seven rows as a result of this proactive AM that may reduce impacts on scallop mortality since results suggest that dredges with fewer rings are more selective for larger scallops, and catch fewer small scallops.

Table 4 and **Figure 8** 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.

1.1.7.2.4 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. A vessel could fish with any number of rings in the apron of the dredge. Eliminating the restriction may have more conservation benefit for flatfish compared to No Action, which requires vessels to fish with a minimum of seven, if vessels choose to fish with seven or less rows of rings. However, simply eliminating the restriction could enable a vessel to fish with as many rows as they want (i.e. more than seven). So compared to No Action this may have some benefit for flatfish for vessels that choose to fish with less than currently allowed (minimum of seven rows), but not as much potential benefit as the option that would implement a maximum of seven rows (Alternative1.1.7.2.3). This is the same alternative as Alternative 1.1.7.1.4 for northern windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yt bycatch as well.

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, which could have some beneficial impacts on small scallops, but it would not require it. By simply eliminating it vessels could also 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.

1.1.7.2.5 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.

1.1.7.2.6 Proactive AM for SNE/MA 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. Framework 25 modified this outdated regulation for all waters west of 71W excluding Mid-Atlantic access areas already as a proactive AM for southern windowpane flounder, but the requirement to have a minimum 7-ring apron still exists for all other areas.

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 Alternative 1.1.7.1.3 for windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yt bycatch as well.

Changing the requirement to a maximum of seven, from a minimum of seven, would enable vessels to fish with fewer rings and a larger twine top. A larger twine top reduces bycatch of finfish and small scallops. There may be beneficial impacts on the scallop resource from this measure since fewer rows of rings increases the escapement of small scallops and does not cause too many large scallops to escape, which would require vessels to fish longer (**Table 4**).

Increased fishing time to compensate for any potential loss in scallop catch is somewhat limited, at least for LA vessels fishing in open areas. Since LA vessels are under DAS in open areas vessels cannot increase the fishing time beyond their annual allocation of DAS. If fewer small scallops are caught with shorter aprons, discard mortality would be lower, having potentially low positive impacts on the resource compared to No Action. These potential benefits may be limited compared to current fishing practices because many vessels already fish with seven rows in the apron of the dredge. Furthermore, LAGC IFQ vessels and LA vessels in access areas are not on DAS, so in theory could fish longer, negating any potential positive impact on the resource from increased escapement of small scallops from shorter aprons.

However, adopting this measure would prevent vessels from fishing with more than seven rows, and enable vessels to fish with fewer rows than seven voluntarily. Fewer rows (i.e. five rows of rings) have been found to reduce bycatch, but fewer than seven is currently prohibited in the regulations. If some vessels decide to fish with fewer than seven rows as a result of this proactive AM that may reduce impacts on scallop mortality since results suggest that dredges with fewer rings are more selective for larger scallops, and catch fewer small scallops.

Table 4 and **Figure 8** 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.

1.1.7.2.7 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. A vessel could fish with any number of rings in the apron of the dredge. Eliminating the restriction may have more conservation benefit for flatfish compared to No Action, which requires vessels to fish with a minimum of seven, if vessels choose to fish with seven or less rows of rings. However, simply eliminating the restriction could enable a vessel to fish with as many rows as they want (i.e. more than seven). So compared to No Action this may have some benefit for flatfish for vessels that choose to fish with less than currently allowed (minimum of seven rows), but not as much potential benefit as the option that would implement a maximum of seven rows (Alternative 1.1.7.2.6). This is the same alternative as Alternative 1.1.7.1.4 for northern windowpane, it is repeated here to highlight that this proactive measure is expected to reduce yt bycatch as well.

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, which could have some beneficial impacts on small scallops, but it would not require it. By simply eliminating it vessels could also 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.

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

SEE SEPARATE DOCUMENT FOR ANALYSES OF VMS ALTERNATIVES

1.1.8.1 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.

1.1.8.2 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 declare out of the fishery (this would require a new DOF code to identify transiting with product on board). Once this DOF trip has been declared, 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.

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

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.

1.1.9 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. Therefore, the impacts are neutral compared to no action.

1.2 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

[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

toward costs, where costs are incurred in the short-term and benefits are realized later." Similarly, the Office of Management and Budget (OMB, 2003) indicated that the analyses should "present the annual time stream of benefits and costs expected to result from the rule," and state that "the beginning point for your stream of estimates should be the year in which the final rule will begin to have effects" and "the ending point should be far enough in the future to encompass all the significant benefits and costs likely to result from the rule."[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 1.1.2. 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.

1.2.1 Acceptable Biological Catch (Section 2.1.1)

1.2.1.1 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

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

the framework. Therefore, the potential impacts of the No Action ABC on economic benefits are neutral.

1.2.1.2 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.

1.2.2 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

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

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 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 5 and Table 6 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 1.1.2.1.1 to Section 1.1.2.1.4 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 1.1.2.1.5, a discussion of the comparative impacts of the specification alternatives. Section 1.1.2.1.5.1 to Section 1.1.2.1.5.5 provide a detailed discussion of economic impacts for landings, prices, effort, employment, trip costs, consumer and producer surpluses and total economic benefits.

Table 5. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status quo (SQ)
FT LA Open area DAS	17	31	30	30	31	30	31
Total landings (Mill. lb.)	19.3	45.2	46.3	46.4	45.2	47.4	37.5
Difference from No Action		25.9	27.1	27.2	25.9	28.2	18.2
Difference from SQ	-18.2	7.7	8.9	9.0	7.7	10.0	
Total revenue (Mill. $)	263.0	557.8	567.1	570.3	557.6	580.3	477.2
Difference from No Action		294.8	304.1	307.3	294.7	317.3	214.2
Difference from SQ	-214.2	80.6	89.9	93.1	80.4	103.1	
Producer Surplus (Mill. $)	245.3	516.0	524.7	527.4	515.9	536.5	442.2
Difference from No Action		270.7	279.4	282.1	270.5	291.2	196.9
Difference from SQ	-196.9	73.8	82.5	85.1	73.6	94.2	
Total Economic Benefits (Mill.$)	248.5	542.0	551.7	554.8	541.8	565.1	459.9
Difference from No Action		293.5	303.3	306.3	293.3	316.6	211.4
Difference from SQ	-211.4	82.1	91.9	94.9	81.9	105.2	

Table 6. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status quo
Total landings (million lb.)	854.9	846.5	849.8	843.6	843.4	842.2	841.3
Total landings *net of No Action* landings (million lb.)		-8.4	-5.1	-11.3	-11.5	-12.7	-13.6
Total landings *net SQ* landings (million lb.)	13.6	5.2	8.5	2.4	2.2	0.9	
Cumulative Present values	**At 3% discount rate**						
Revenue ($ million)	8077.6	8118.4	8123.9	8098.4	8088.7	8088.4	8041.7
Producer Surplus ($ million)	7468.6	7507.5	7512.8	7489.2	7480.0	7479.9	7435.7
Total Benefits ($ million)	8024.7	8037.5	8045.7	8015.3	8005.3	8004.3	7959.6
Cumulative Present values	**At 7% discount rate**						
Revenue ($ million)	6467.3	6541.7	6534.2	6524.8	6512.6	6520.0	6461.2
Producer Surplus ($ Million)	5979.1	6048.8	6042.5	6033.5	6022.0	6029.0	5974.1
Total Benefits ($ Million)	6429.1	6478.5	6472.5	6459.7	6447.1	6454.2	6396.7
Difference from status quo	**At 3% discount rate**						
Revenue ($ Million)	35.9	76.7	82.2	56.7	47.0	46.7	
Producer Surplus ($ Million)	32.8	71.8	77.1	53.5	44.3	44.1	
Total Benefits ($ Million)	65.1	78.0	86.1	55.7	45.8	44.7	
Difference from No Action	**At 3% discount rate**						
Revenue ($ Million)		40.9	46.3	20.8	11.1	10.8	-35.9
Producer Surplus ($ Million)		39.0	44.3	20.7	11.5	11.3	-32.8
Total Benefits ($ Million)		12.9	21.0	-9.4	-19.4	-20.4	-65.1
Difference from Status Quo	**At 7% discount rate**						
Revenue ($ Million)	6.0	80.4	73.0	63.5	51.4	58.8	
Producer Surplus ($ Million)	5.1	74.7	68.4	59.5	47.9	54.9	
Total Benefits ($ Million)	32.3	81.7	75.8	62.9	50.3	57.5	
Difference from No Action	**At 7% discount rate**						
Revenue ($ Million)		74.4	66.9	57.5	45.3	52.8	-6.0
Producer Surplus ($ Million)		69.7	63.3	54.4	42.9	49.9	-5.1
Total Benefits ($ Million)		49.4	43.5	30.6	18.0	25.2	-32.3

1.2.2.1.1 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 6). 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.

1.2.2.1.2 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.

1.2.2.1.3 ALT3 with 3 or 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 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 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.

The PDT ran two separate model runs to assess the impacts of this alternative. Run 3 all three closure options, and Run 4 only included two of the three closure options (not the ETA closure). For both runs, ALT3 would have short and long term positive economic impacts compared to the No Action, and 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. 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 (Table 6). 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 would be $55.7 million (at 7% discount rate) to $62.9 million (at 3% discount

rate) higher than the benefits for SQ scenario. Therefore, 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.

1.2.2.1.4 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 6). 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.

1.2.2.1.5 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 1.1.2.3 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 6).
- It should be pointed out that the actual values of revenues for all alternatives could potentially exceed those shown in Table 1 to Table 6. They are based on conservative estimates for prices (Table 9 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 17). 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.

1.2.2.1.5.1 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 7. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status Quo
2015-2016	2015	19.3	45.2	46.3	46.4	45.2	47.4	37.5
	2016	75.7	66.7	54.8	63.9	66.6	63.0	68.5
2015-2016 Total		**95.0**	**111.8**	**101.1**	**110.4**	**111.7**	**110.4**	**105.9**
2017-2019	2017	83.7	75.3	73.9	74.3	75.2	73.9	76.4
	2018	73.4	68.4	73.7	68.8	68.2	69.0	68.1
	2019	65.6	62.3	70.9	66.3	61.0	67.2	60.8
2017-2019 Total		**222.7**	**206.0**	**218.6**	**209.4**	**204.5**	**210.1**	**205.3**
2020-2028	2020	62.0	61.1	60.7	58.4	58.4	58.9	59.9
	2021	60.1	60.4	59.3	57.6	57.5	57.7	59.3
	2022	59.5	59.3	58.3	57.9	58.2	58.1	58.0
	2023	59.0	58.1	57.9	58.2	58.8	58.6	57.2
	2024	58.7	57.3	58.3	59.2	58.9	58.1	57.5
	2025	59.0	57.9	59.0	59.2	59.3	57.6	58.3
	2026	59.6	58.4	59.3	58.6	59.4	57.4	59.5
	2027	59.8	58.1	58.8	57.7	58.5	57.5	60.3
	2028	59.6	57.9	58.4	57.3	58.3	57.9	60.0
2020-2028 Total		**537.2**	**528.6**	**530.1**	**523.9**	**527.2**	**521.7**	**530.0**
Grand Total		**854.9**	**846.5**	**849.8**	**843.6**	**843.4**	**842.2**	**841.3**

Table 8. Estimated landings net of SQ levels (Million lb.)

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

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 9. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status Quo
2015-2016	2015	13.65	12.35	12.24	12.28	12.35	12.24	12.74
	2016	10.89	11.24	11.74	11.35	11.25	11.39	11.15
2015-2016 Total		**12.06**	**12.27**	**11.79**	**11.99**	**11.82**	**11.80**	**11.81**
2017-2019	2017	10.50	10.82	10.88	10.87	10.83	10.89	10.77
	2018	10.95	11.17	10.94	11.16	11.17	11.15	11.17
	2019	11.27	11.43	11.11	11.31	11.47	11.27	11.48
2017-2019 Total		**10.73**	**10.91**	**11.14**	**10.98**	**11.11**	**11.15**	**11.10**
2020-2028	2020	11.46	11.52	11.51	11.61	11.62	11.58	11.57
	2021	11.58	11.56	11.58	11.68	11.69	11.66	11.58
	2022	11.61	11.61	11.64	11.67	11.67	11.66	11.64
	2023	11.63	11.66	11.67	11.68	11.64	11.63	11.69
	2024	11.65	11.70	11.66	11.63	11.63	11.65	11.69
	2025	11.66	11.69	11.63	11.61	11.62	11.68	11.65
	2026	11.62	11.66	11.61	11.64	11.61	11.69	11.60
	2027	11.61	11.67	11.63	11.68	11.64	11.70	11.56
	2028	11.61	11.69	11.66	11.71	11.67	11.69	11.57
2020-2028 Total		**11.41**	**11.60**	**11.64**	**11.62**	**11.66**	**11.64**	**11.66**
Grand Total		**11.55**	**11.55**	**11.54**	**11.56**	**11.56**	**11.56**	**11.56**

The economic impacts of the alternatives considered in this Framework were compared in Table 5and Table 6 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 10 (undiscounted values) and in Table 11 (at 3% discount rate) to Table 14 (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 10. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status Quo
2015-2016	2015	263.0	557.8	567.1	570.3	557.6	580.3	477.2
	2016	824.5	749.4	642.7	726.0	748.7	717.5	763.9
2015-2016 Total		**1087.5**	**1307.2**	**1209.8**	**1296.3**	**1306.3**	**1297.8**	**1241.1**
2017-2019	2017	879.5	814.7	804.5	807.3	814.3	804.4	822.9
	2018	804.2	764.2	806.9	768.0	762.3	769.7	760.2
	2019	739.2	712.2	788.0	749.6	699.6	757.1	698.6
2017-2019 Total		**2422.9**	**2291.1**	**2399.4**	**2324.8**	**2276.2**	**2331.2**	**2281.7**
2020-2028	2020	710.5	704.1	698.3	678.2	678.1	682.0	692.4
	2021	695.8	697.9	687.2	672.3	671.9	672.6	686.9
	2022	690.3	688.1	678.9	675.3	679.6	676.9	675.3
	2023	686.3	677.9	675.9	679.1	684.1	681.0	668.9
	2024	683.5	670.7	680.0	688.0	685.3	676.5	672.0
	2025	687.3	677.4	685.6	687.3	689.4	672.5	679.8
	2026	692.7	681.3	688.9	681.7	689.1	671.2	690.7
	2027	693.5	677.5	684.1	673.5	681.4	672.7	696.7
	2028	692.7	677.1	681.2	670.7	680.3	677.0	694.2
2020-2028 Total		**6232.5**	**6152.0**	**6160.0**	**6106.1**	**6139.1**	**6082.5**	**6156.9**
Grand Total		**9742.9**	**9750.3**	**9769.1**	**9727.2**	**9721.7**	**9711.5**	**9679.6**

Table 11. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status Quo
2015-2016	1063.5	1285.4	1191.0	1275.1	1284.5	1276.9	1218.8
2017-2019	2221.7	2100.0	2196.8	2129.7	2086.8	2135.3	2092.0
2020-2028	4792.4	4733.0	4736.0	4693.5	4717.4	4676.3	4730.8
Grand Total	**8077.6**	**8118.4**	**8123.9**	**8098.4**	**8088.7**	**8088.4**	**8041.7**

Table 12. 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. 2 closures	4. Reduced F	Extra GC with 2 closures
2015-2016	-155.4	66.6	-27.8	56.3	65.7	58.0
2017-2019	129.7	8.0	104.8	37.7	-5.2	43.2
2020-2028	61.6	2.2	5.2	-37.3	-13.4	-54.6
Grand Total	**35.9**	**76.7**	**82.2**	**56.7**	**47.0**	**46.7**

Table 13. Present value of total scallop revenue (Million $, using 7% discount rate)

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

Table 14. 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. 2 closures	4. Reduced F	Extra GC with 2 closures
2015-2016	-157.6	67.1	-23.4	57.7	66.2	59.7
2017-2019	116.3	6.5	90.2	31.6	-5.0	36.2
2020-2028	47.3	6.9	6.1	-25.7	-9.9	-37.1
Grand Total	**6.0**	**80.4**	**73.0**	**63.5**	**51.4**	**58.8**

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

Table 15 shows open area DAS per full-time vessel for each alternative and fishing year and Table 16 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 17). 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 18 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 19 using a discount rate of 3% and in Table 20 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 15. Open area DAS per limited access vessel

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

Table 16. Total DAS (sum of open and access areas)

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

Table 17. 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. 2cl	4. Reduced F	6. Extra GC with 2 closures
2015-2016	2015	-49.53%	19.50%	21.24%	22.78%	19.46%	25.36%
	2016	9.40%	-2.21%	-18.73%	-5.99%	-2.35%	-7.37%
2015-2016 Total		**-12.52%**	**5.86%**	**-3.86%**	**4.71%**	**5.76%**	**4.81%**
2017-2019	2017	8.58%	-1.19%	-3.29%	-2.55%	-1.29%	-2.95%
	2018	6.63%	0.75%	7.38%	1.19%	0.35%	1.41%
	2019	6.17%	2.28%	14.67%	7.61%	-0.06%	9.09%
2017-2019 Total		**7.21%**	**0.49%**	**5.63%**	**1.75%**	**-0.38%**	**2.12%**
2020-2028	2020	2.42%	1.83%	0.70%	-2.60%	-2.62%	-1.82%
	2021	1.18%	1.74%	0.10%	-2.32%	-2.46%	-2.05%
	2022	2.07%	1.76%	0.56%	0.15%	0.71%	0.39%
	2023	2.37%	0.88%	1.03%	1.77%	2.35%	1.84%
	2024	1.36%	-0.96%	1.10%	2.38%	1.89%	0.28%
	2025	0.74%	-0.97%	0.58%	0.71%	1.17%	-1.77%
	2026	-0.28%	-2.22%	-0.72%	-2.09%	-0.88%	-3.72%
	2027	-1.07%	-3.60%	-2.39%	-4.27%	-2.97%	-4.11%
	2028	-0.53%	-2.98%	-2.10%	-3.97%	-2.43%	-2.71%
2020-2028 Total		**0.90%**	**-0.52%**	**-0.14%**	**-1.17%**	**-0.61%**	**-1.55%**
Grand Total		**0.67%**	**0.54%**	**0.75%**	**0.28%**	**0.27%**	**0.14%**

Table 18. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status quo
2015-2016	2015	17.6	41.8	42.4	42.9	41.8	43.8	35.0
	2016	64.5	57.7	47.9	55.5	57.6	54.6	59.0
2015-2016 Total		**82.2**	**99.4**	**90.3**	**98.4**	**99.4**	**98.5**	**93.9**
2017-2019	2017	69.5	63.2	61.9	62.4	63.2	62.1	64.0
	2018	60.7	57.4	61.2	57.6	57.2	57.8	57.0
	2019	55.5	53.4	59.9	56.2	52.2	57.0	52.2
2017-2019 Total		**185.7**	**174.0**	**182.9**	**176.2**	**172.5**	**176.9**	**173.2**
2020-2028	2020	53.1	52.8	52.2	50.5	50.5	50.9	51.9
	2021	52.0	52.3	51.4	50.2	50.1	50.3	51.4
	2022	51.6	51.4	50.8	50.6	50.9	50.7	50.5
	2023	51.3	50.5	50.6	50.9	51.2	51.0	50.1
	2024	51.1	49.9	51.0	51.6	51.4	50.5	50.4
	2025	51.5	50.6	51.4	51.5	51.7	50.2	51.1
	2026	51.9	50.9	51.7	50.9	51.6	50.1	52.0
	2027	51.9	50.6	51.2	50.2	50.9	50.3	52.5
	2028	51.8	50.6	51.0	50.1	50.9	50.7	52.1
2020-2028 Total		**466.1**	**459.5**	**461.3**	**456.5**	**459.1**	**454.8**	**461.9**
Grand Total		**734.0**	**733.0**	**734.5**	**731.1**	**731.0**	**730.1**	**729.1**

Table 19. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status quo
2015-2016	80.3	97.8	88.9	96.8	97.7	96.9	92.2
2017-2019	170.4	159.6	167.5	161.5	158.2	162.0	158.9
2020-2028	358.4	353.6	354.6	350.9	352.8	349.6	354.9
Grand Total	**609.0**	**610.9**	**611.1**	**609.1**	**608.7**	**608.5**	**606.0**

Table 20. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status quo
2015-2016	78.0	95.7	87.2	94.7	95.6	94.9	90.1
2017-2019	152.6	142.8	149.7	144.4	141.7	144.9	142.2
2020-2028	257.6	254.4	254.9	252.1	253.3	251.3	254.8
Grand Total	**488.1**	**492.9**	**491.7**	**491.3**	**490.6**	**491.0**	**487.2**

1.2.2.1.5.3 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 21 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 21. 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. 2 closures	4. Reduced F	6. Extra GC with 2 closures	Status quo
2015-2016	2015	245	516	525	527	516	536	442
	2016	760	692	595	671	691	663	705
2015-2016 Total		**1005**	**1208**	**1119**	**1198**	**1207**	**1199**	**1147**
2017-2019	2017	810	751	743	745	751	742	759
	2018	743	707	746	710	705	712	703
	2019	684	659	728	693	647	700	646
2017-2019 Total		**2237**	**2117**	**2216**	**2149**	**2104**	**2154**	**2108**
2020-2028	2020	657	651	646	628	628	631	641
	2021	644	646	636	622	622	622	635
	2022	639	637	628	625	629	626	625
	2023	635	627	625	628	633	630	619
	2024	632	621	629	636	634	626	622
	2025	636	627	634	636	638	622	629
	2026	641	630	637	631	638	621	639
	2027	642	627	633	623	630	622	644
	2028	641	626	630	621	629	626	642
2020-2028 Total		**5766**	**5692**	**5699**	**5650**	**5680**	**5628**	**5695**
Grand Total		**9009**	**9017**	**9035**	**8996**	**8991**	**8981**	**8951**

Table 22. Present value of producer surplus (using 3% discount rate, Million $)

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

Table 23. Present value of producer surplus net of No Action values (using 3% discount rate, Million $)

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

Table 24. Present value of producer surplus (using 7% discount rate, Million $)

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

Table 25. 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. 2 closures	4. Reduced F	6. Extra GC with 2 closures
2015-2016	-145.4	61.5	-20.5	53.0	60.7	54.9
2017-2019	106.0	5.9	82.8	29.4	-4.4	33.6
2020-2028	44.5	7.4	6.1	-23.0	-8.4	-33.6
Grand Total	**5.1**	**74.7**	**68.4**	**59.5**	**47.9**	**54.9**

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

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

Table 27. 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. 2 closures	4. Reduced F	Extra GC with 2 closures
2015-2016	-2.8	5.7	-10.0	3.1	5.5	2.9
2017-2019	26.3	0.8	18.4	5.3	-1.4	6.2
2020-2028	8.8	-0.2	0.6	-6.1	-2.7	-8.6
Grand Total	**32.3**	**6.2**	**9.0**	**2.3**	**1.5**	**0.6**

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

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

Table 29. 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. 2 closures	4. Reduced F	Extra GC with 2 closures
2015-2016	-3.2	5.8	-9.2	3.4	5.6	3.2
2017-2019	23.7	0.6	15.8	4.3	-1.3	5.1
2020-2028	6.8	0.7	0.8	-4.2	-2.0	-5.8
Grand Total	**27.3**	**7.0**	**7.4**	**3.5**	**2.4**	**2.6**

1.2.2.1.5.5 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 31(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 34 (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 34).

Table 30. 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. 2 closures	4. Reduced F	Extra GC with 2 closures	Status quo (SQ)
2015-2016	2015	248	542	552	555	542	565	460
	2016	829	746	632	721	745	711	762
2015-2016 Total		**1077**	**1288**	**1183**	**1275**	**1287**	**1277**	**1222**
2017-2019	2017	892	819	808	811	818	807	828
	2018	808	763	811	767	761	769	759
	2019	736	706	789	747	693	755	691
2017-2019 Total		**2436**	**2288**	**2407**	**2325**	**2272**	**2332**	**2279**
2020-2028	2020	704	697	691	670	669	674	685
	2021	688	690	679	663	662	663	679
	2022	682	680	670	666	670	668	666
	2023	678	669	667	670	675	672	659
	2024	675	661	671	679	677	667	662
	2025	679	668	677	679	681	663	671
	2026	685	672	680	673	681	662	682
	2027	686	668	675	664	673	663	689
	2028	685	668	672	661	671	668	686
2020-2028 Total		**6161**	**6075**	**6082**	**6025**	**6060**	**6000**	**6079**
Grand Total		**9674**	**9651**	**9673**	**9625**	**9619**	**9608**	**9579**

Table 31. Present value of total economic benefits (using 3% discount rate, Million $)

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

Table 32. 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. 2 closures	4. Reduced F	Extra GC with 2 closures
2015-2016	-146.2	66.7	-34.5	54.9	65.7	56.3
2017-2019	144.5	8.1	114.5	40.3	-6.0	46.3
2020-2028	66.8	3.2	6.0	-39.5	-14.0	-57.9
Grand Total	**65.1**	**78.0**	**86.1**	**55.7**	**45.8**	**44.7**

Table 33. Present value of total economic benefits (using 7% discount rate, Million $)

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

Table 34. 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. 2 closures	4. Reduced F	Extra GC with 2 closures
2015-2016	-148.6	67.3	-29.7	56.4	66.3	58.1
2017-2019	129.6	6.4	98.6	33.8	-5.7	38.7
2020-2028	51.3	8.0	6.9	-27.2	-10.3	-39.4
Grand Total	**32.3**	**81.7**	**75.8**	**62.9**	**50.3**	**57.5**

1.2.2.2 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.

1.2.2.2.1 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.

1.2.2.2.2 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.

1.2.2.2.3 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??). 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 5 to Table 34 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.

1.2.2.2.4 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.

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

1.2.2.3.1 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.

1.2.2.3.2 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.

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. This could 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.

ECONOMIC IMPACTS OF OTHER MEASURES WILL BE INCLUDED IN SUPPLEMENTAL ANALYSIS DOCUMENT