DRAFT

Framework 28 to the Scallop FMP

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Addendum 1 –Economic and Social Trends in the Atlantic Sea Scallop Fishery begins on page 87.

Initial Council Meeting: June 21-23, 2016
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Submission of Preliminary EA:
Submission of Final EA:

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1.0 BACKGROUND AND PURPOSE

1.1 BACKGROUND

This framework to the Scallop Fishery Management Plan (FMP) sets fishery specifications for fishing year (FY) 2017 and default measures for FY 2018. The New England Fishery Management (Council) decided to develop a one-year action only, including default measures for Year 2 only (FY2018).

The list of measures required to be in a framework has increased over the years to include overall annual catch limits, specific allocations for both limited access (LA) and limited access general category (LAGC) vessels. Below is a list of the measures required as part of the scallop fishery specifications:

- Overfishing Limit (OFL) and Acceptable Biological Catch (ABC), which is approved by the SSC;
- Annual Catch Limits (ACL) (for both the limited access and limited access general category fisheries, and Annual Catch Target (ACT) for the LA fishery;
- Allocations for limited access vessels include DAS allocations, access area allocations with associated possession limits;
- Allocations for limited access general category vessels include an overall IFQ for both permit types, as well as a fleetwide, area-specific maximum number of access area trips available for the general category fishery;
- NGOM hard-TAC;
- Incidental catch target-TAC; and Set-aside of scallop catch for the industry funded observer program and research set-aside program.

The Council also included management measures for consideration in this action. They include: 1) measures to restrict the possession of shell stock inshore of 42° 20’ N; 2) measures to apply spatial management to fishery specifications (ACL flowchart). Measures to apply spatial management to fishery specifications (Section 2.3) are linked to the range of specification alternatives under consideration in this document, and a range of allocation options have been developed for Section 2.3.1 (No Action) and Section 2.3.2 (Fishery Allocations Based on Spatial Management).

1.2 PURPOSE AND NEED

This Framework (FW28) is intended to set specifications and to adjust management measures for the Atlantic Sea Scallop fishery. The need for this action is to achieve the objectives of the Atlantic Sea Scallop FMP to prevent overfishing and optimize yield by improving yield-per-recruit from the fishery, to apply spatial management to all part of the specification setting process, to remove incentives allowing LA vessels to possess and process large quantities of scallops while not using a DAS, and to facilitate access to newly opened portions of CA I, consistent with the OHA2 Final Rule.

The purpose for this action is to set specifications including: OFL, ABC, scallop fishery ACLs and ACTs including associated set-asides, day-at-sea (DAS) allocations, general category fishery

allocations, and area rotation schedule and allocations for the 2017 fishing year, as well as default measures for FY2018 that are expected to be replaced by a subsequent action.

Table 1 - Description of Framework 28 purpose and need.

Need	Purpose	Section(s)
To achieve the objectives of the Atlantic Sea Scallop FMP to prevent overfishing and improve yield-per recruit from the fishery	To set specifications including: OFL, ABC, scallop fishery ACLs and ACTs including associated set-asides, day-at-sea (DAS) allocations, general category fishery allocations, and area rotation schedule and allocations for the 2017 fishing year, as well as default measures for FY2018 that are expected to be replaced by a subsequent action.	Sections 2.1, 2.2, 2.3, 2.4, and 2.5
To apply the spatial management to the specification setting process	To set specifications for the LA and LAGC IFQ components based on exploitable biomass in areas which will be open to the fishery (spatial management).	Section 2.3
To remove the incentive to not use a DAS while possessing and processing in excess of 50 bu of shell stock.	To prohibit the possession of shell stock in excess of 50 bu inshore of the DAS demarcation line north of 42 20'N.	Section 2.6

1.3 SUMMARY OF SCALLOP FISHERY MANAGEMENT PLAN

1.3.1 Summary of Past Actions

The Atlantic Sea Scallop FMP management unit consists of the sea scallop Placopecten magellanicus (Gmelin) resource throughout its range in waters under the jurisdiction of the United States. This includes all populations of sea scallops from the shoreline to the outer boundary of the Exclusive Economic Zone (EEZ). While fishing for sea scallops within state waters is not subject to regulation under the FMP except for vessels that hold a federal permit when fishing in state waters, the scallops in state waters are included in the overall management unit. The principal resource areas are the Northeast Peak of Georges Bank, westward to the Great South Channel, and southward along the continental shelf of the Mid-Atlantic.

The Council established the Scallop FMP in 1982. A number of Amendments and Framework Adjustments have been implemented since that time to adjust the original plan, and some Amendments and Framework Adjustments in other plans have impacted the fishery. This section will briefly summarize the major actions that have been taken to shape the current scallop

resource and fishery, but a complete list of the measures as well as the actions themselves are available on the NEFMC website (http://www.nefmc.org/scallops/index.html).

Amendment 4 was implemented in 1994 and introduced major changes in scallop management, including a limited access program to stop the influx of new vessels. Qualifying vessels were assigned different day-at-sea (DAS) limits according to which permit category they qualified for: full-time, part-time or occasional. Some of the more notable measures included new gear regulations to improve size selection and reduce bycatch, a vessel monitoring system to track a vessel's fishing effort, and an open access general category scallop permit was created for vessels that did not qualify for a limited access permit. Also in 1994, Amendment 5 to the Northeast Multispecies FMP closed large areas on Georges Bank to scallop fishing over concerns of finfish bycatch and disruption of spawning aggregations (Closed Area I, Closed Area II, and the Nantucket Lightship Area - See Figure 1).

In 1998, the Council developed Amendment 7 to the Scallop FMP, which was needed to change the overfishing definition, the day-at-sea schedule, and measures to meet new lower mortality targets to comply with new requirement under the Magnuson-Stevens Act. In addition, Amendment 7 established two new scallop closed areas (Hudson Canyon and VA/NC Areas) in the Mid-Atlantic to protect concentrations of small scallops until they reached a larger size.

In 1999, Framework Adjustment 11 to the Scallop FMP allowed the first scallop fishing within portions of the Georges Bank groundfish closed areas since 1994 after resource surveys and experimental fishing activities had identified areas where scallop biomass was very high due to no fishing in the intervening years. This successful "experiment" with closing an area and reopening it for controlled scallop fishing further motivated the Council to shift overall scallop management to an area rotational system that would close areas and reopen them several years later to prevent overfishing and optimize yield.

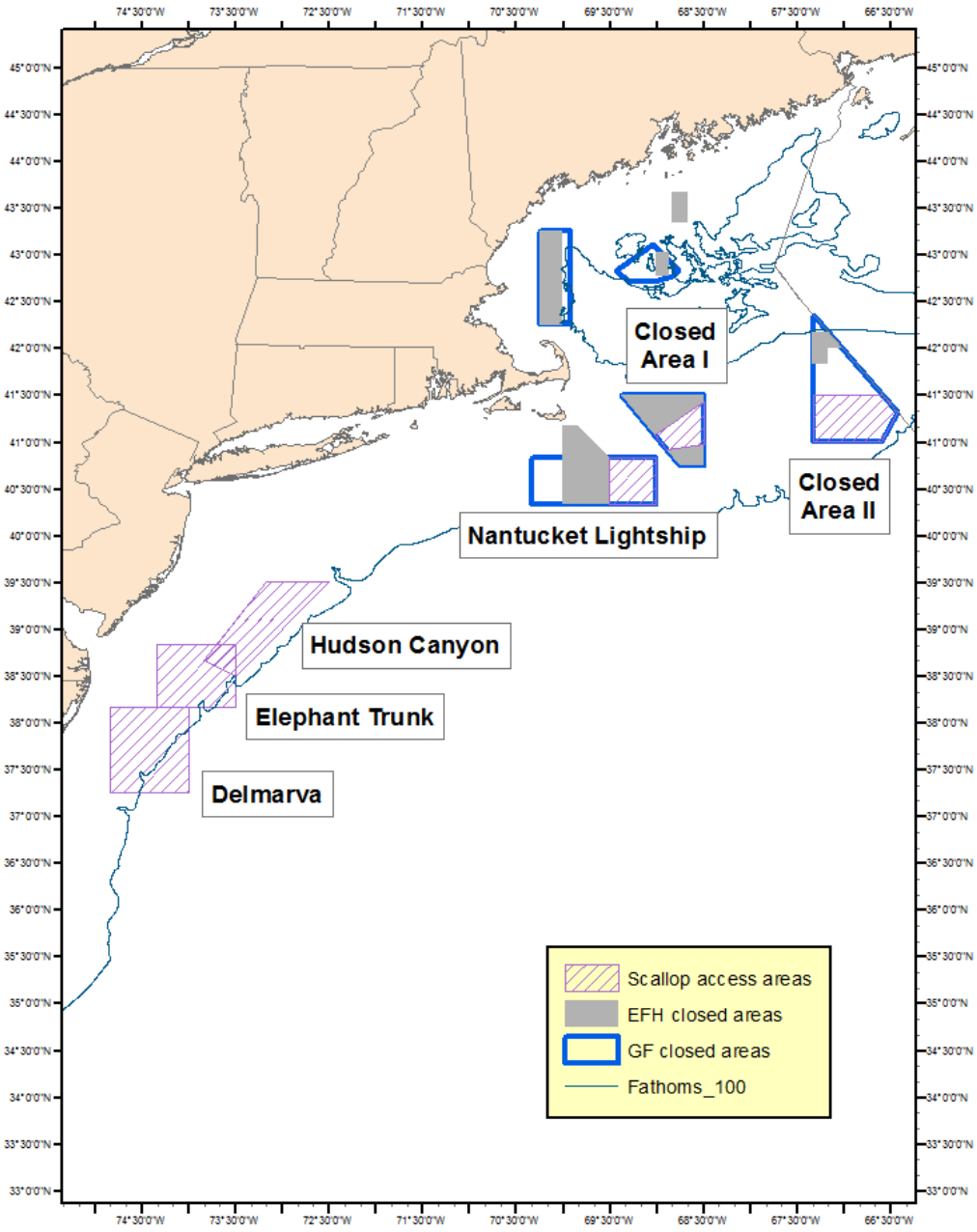
In 2004, Amendment 10 to the Scallop FMP formally introduced rotational area management and changed the way that the FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of DAS for limited vessels to fish in any area, vessels had to use a portion of their total DAS allocation in the controlled access areas defined by the plan, or exchange them with another vessel to fish in a different controlled access area. The amendment also adopted several alternatives to minimize impacts on EFH, including designating EFH closed areas, which included portions of the groundfish mortality closed areas. See Section 1.3.2 below for a more detailed description of the rotational area management program implemented by Amendment 10.

As the scallop resource rebuilt under area rotation biomass increased inshore and fishing pressure increased by open access general category vessels starting in 2001. Landings went from an average of about 200,000 pounds from 1994-2000 to over one million pounds consistently from 2001-2003 and 3-7 million pounds each year from 2004-2006 (NEFMC, 2007). In June 2007 the Council approved Amendment 11 to the Scallop FMP and it was effective on June 1, 2008. The main objective of the action was to control capacity and mortality in the general category scallop fishery. Amendment 11 implemented a limited entry program for the general category fishery where each qualifying vessel received an individual allocation in pounds of scallop meat with a possession limit of 400 pounds. The fleet of qualifying vessels receives a total allocation of 5% of the total projected scallop catch each fishing year. This action also established separate limited entry programs for general category fishing in the Northern Gulf of

Maine and an incidental catch permit category (up to 40 pounds of scallop meat per trip while fishing for other species).

More recently Amendment 15 to the Scallop FMP was implemented in 2011. This action brought the FMP in compliance with new requirements of the re-authorized MSA (namely ACLs and AMs) as well as a handful of other measures to improve the overall effectiveness of the FMP. A more detailed summary of the various annual catch limits and how fishery specifications are set in this fishery are described in Section 1.3.3.

Figure 1 - Past and present scallop management areas (with reference to groundfish and habitat closures).



1.3.2 Summary of Scallop Area Rotation Program

Rotational area management is the cornerstone of scallop fisheries management. There are four types of areas in this system: 1) "open areas" where scallop fishing can occur using DAS or IFQ; 2) areas completely closed to scallop fishing year-round to reduce impacts on EFH and/or groundfish mortality; 3) areas temporarily closed to scallop vessels to protect small scallops until a future date; and 4) areas open to very restricted levels of scallop fishing called "access areas". When scallop vessels are fishing in these areas they are limited in terms of total removal and sometimes season.

Amendment 10 introduced area rotation: areas that contain beds of small scallops are closed before the scallops experience fishing mortality, then the areas re-open when scallops are larger, producing more yield-per-recruit. The details of which areas should close, for how long and at what level they should be fished were described and analyzed in Amendment 10. Except for the access areas within the groundfish closed areas on Georges Bank, all other scallop rotational areas should have flexible boundaries. Amendment 10 included a detailed set of criteria or guidelines that would be applied for closing and re-opening areas. Framework adjustments would then be used to actually implement the closures and allocate access in re-opened areas.

The general management structure for area rotation management is described in Table 2. In theory, an area would close when the expected increase in exploitable biomass in the absence of fishing mortality exceeds 30% per year, and re-open to fishing when the annual increase in the absence of fishing mortality is less than 15% per year. Area rotation allows for differences in fishing mortality targets to catch scallops at higher than normal rates by using a time averaged fishing mortality so the average for an area since the beginning of the last closure is equal to the resource-wide fishing mortality target.

Figure 1 shows the boundaries of current and past scallop access areas (purple hatched areas) on Georges Bank and in the Mid-Atlantic. Areas that are closed to the scallop fishery are indicated as well: groundfish mortality closed areas (hollow) and EFH closed areas (hatched). For the most part some of these areas are closed to the fishery if small scallops are present, some areas are open as access areas with a controlled level of fishing, and some may be "open areas" that may be fished using DAS, not access area trips. Each year limited access vessels are allocated a set number of trips with possession limits to fish in specific access areas. And general category vessels are awarded a fleetwide maximum of trips that can be taken per area.

The NEFMC has approved the EFH Omnibus Amendment, an action that considered modifications to the EFH and groundfish mortality closed areas in this region. Based on the outcome of that action the current boundaries of these closed areas may change. Therefore, future scallop access areas may also be different, and current restrictions to fish in EFH closed areas may be different as well. The potential modifications for existing closures, if approved, would not be implemented until mid-2017 under the best case scenario.

Table 2 - General managemnt structure for area rotation as implemented by Amendment 10.

Area type	Criteria for rotation area management consideration	General management rules	Who may fish
Closed rotation	Rate of biomass growth exceeds 30% per year if closed.	No scallop fishing allowed Scallop limited access and general category vessels may transit closed rotation areas provided fishing gear is properly stowed. Scallop bycatch must be returned intact to the water in the general location of capture.	Any vessel may fish with gear other than a scallop dredge or scallop trawl Zero scallop possession limit
Re-opened controlled access	A previously closed rotation area where the rate of biomass growth is less than 15% per year if closure continues. Status expires when time averaged mortality increases to average the resource-wide target, i.e. as defined by the Council by setting the annual mortality targets for a re-opened area.	Fishing mortality target set by framework adjustment subject to guidelines determined by time averaging since the beginning of the most recent closure. Maximum number of limited access trips will be determined from permit activity, scallop possession limits, and TACs associated with the time-average annual fishing mortality target. Transfers of scallops at sea would be prohibited	Limited access vessels may fish for scallops only on authorized trips. Vessels with general category permits will be allowed to target scallops or retain scallop incidental catch, with a 400 pounds scallop possession limit in accordance with general category rules.
Open	Scallop resource does not meet criteria to be classified as a closed rotation or re-opened controlled access area	Limited access vessels may target scallops on an open area day-at-sea General category vessels may target sea scallops with dredges or trawls under existing rules. Transfers of scallops at sea would be prohibited	All vessels may fish for scallops and other species under applicable rules.

1.3.3 Summary of Scallop Fishery Specifications and Annual Catch Limits

Amendment 15 established a method for accounting for all catch in the scallop fishery and included designations of Overfishing Limit (OFL), ABC, ACLs, and Annual Catch Targets (ACT) for the scallop fishery, as well as scallop catch for the Northern Gulf of Maine (NGOM), incidental, and state waters catch components of the scallop fishery. The scallop fishery assessment will determine the exploitable biomass, including an assessment of discard and incidental mortality (mortality of scallops resulting from interaction, but not capture, in the scallop fishery).

Based on the assessment, OFL is specified as the level of landings, and associated F that, above which, overfishing is occurring. OFL will account for landings of scallops in state waters by vessels without Federal scallop permits. The previous assessment of the scallop fishery (SAW 50, 2010) determined that the F associated with the OFL is 0.38. The updated assessment, SARC59, approved a higher OFL equivalent to 0.48. To account for scientific uncertainty, ABC is set at a level with an associated F that has a 25-percent probability of exceeding F associated with OFL (i.e., a 75-percent probability of being below the F associated with OFL).

In the Scallop FMP ACL is equal to ABC. SAW 50 determined that the F associated with the ABC/ACL is 0.32. The updated assessment, SARC 59, approved a higher OFL; therefore, the F

associated with ABC/ACL is higher as well, F = 0.38. Set-asides for observer and RSA are removed from the ABC (1 percent of the ABC/ACL and 1.25 M lb. (567 mt) respectively). After those set-asides are removed, the remaining available catch is divided between the LA and LAGC fisheries into two sub-ACLs; 94.5% for the LA fishery sub-ACL, and 5.5% for the LAGC fishery sub-ACL. Figure 3 summarizes how the various ACL terms are related in the Scallop FMP.

To account for management uncertainty, Amendment 15 established ACTs for each fleet. For the LA fleet, the ACT will have an associated F that has a 25-percent chance of exceeding ABC. The major sources of management uncertainty in the LA fishery are carryover provisions including the 10 DAS carryover provision, and the ability to fish unused access area allocation within the first 60 days of the following fishing year. The F associated with this ACT for the LA fishery is currently estimated to be 0.28. The fishery specifications allocated to the fishery may be set at an F rate lower than this level based on available resource, but fishery specifications may not exceed this level. For example, in FY2014 several specification alternatives were considered that had various estimated of overall F ranging from 0.10 to 0.21. Again, because the updated assessment, SARC59 approved a higher OFL, the F associated with ACT is higher as well. The new ACT is based on applying an overall fishing mortality of 0.34. For the LAGC fleet, the ACT will be set equal to the LAGC fleet's sub-ACL, since that fishery is quota managed and is presumed to have less management uncertainty.

Finally, catch from the NGOM is established at the ABC/ACL level, but is not subtracted from ABC/ACL. Since the NGOM portion of the scallop fishery is not part of the scallop assessment, the catch will be added and specified as a separate Total Allowable Catch (TAC), in addition to ABC/ACL.

1.4 DEFAULT MEASURES APPROVED IN FRAMEWORK 27

The Council routinely sets default measures for the fishing year following the intended length of an action in the event that subsequent actions are not in place at the start of the following fishing year. For example, the scallop fishing year starts on March 1 in 2017, but complete management measures are not usually in place until May. This lag is primarily due to the fact that scallop specifications are set using the most up to date survey data collected the summer before the start of the fishing year. The results are typically available in August, a new ABC is reviewed by the SSC in September, and the PDT develops and analyzes specification alternatives in early fall before final Council action at the November meeting. Staff generally completes the submission package by the end of the year and the action is reviewed and implemented by NMFS typically in May.

In the past, measures have been in place on March 1 that are inferior to measures proposed for implementation in a subsequent action using more updated information. For example, ultimate catch levels may be higher or lower depending on updated survey results, some areas with access area trips assigned may not be able to support that level of effort, or small scallops may show up in a new survey suggesting the area should be closed to protect new recruitment. In some years in order to minimize the potentially negative impacts of having measures in place on March 1 that ultimately need to be changed, the Council has only allocated DAS to the limited access fishery; no access area trips were assigned to limited access vessels or general category vessels.

The Council has the authority to set more measures as default, but for the most part has mostly only allocated DAS. However, in FW27 the Council decided to also allocate one access area trip

in the Mid-Atlantic access area effective on April 1. It was relatively certain that some level of access would be available in the MA AA in 2017 when measures were developed in 2015; therefore, a limited level of access was included in default measures. April 1 was stipulated to give scallops one additional month of growth potential before the new allocations. In addition, vessels would be able to fish FY 2016 compensation trips in the access areas that were open in FY 2016 for the first 60 days of FY2017 (i.e., March 1 through April 29, 2017). This carryover provision has been in place for many years. Under FY2017 default measures the Council also stipulated that 2017 RSA compensation fishing would not be allowed in access areas, until a new framework action allowed it (potentially FW28, this action). The crew limits in place for both open and access areas (one additional crew member compared to open areas) would remain in place under default measures.

The default measures for 2017 also included the required ABC and ACL values, but they will likely be replaced by this action. The table below summarizes the default values that will be effective on March 1, 2017 until FW28 is implemented to replace them. Vessels with a LAGC IFQ permit will receive an allocation based on the contribution factor assuming the total LAGC IFQ is 4.4 million pounds. Their allocations for FY2017 may ultimately change based on the final sub-ACL approved in FW28. LAGC IFQ vessels are responsible to payback any overage the following year if the ultimate IFQ for FY2017 is lower than the allocation under the default sub-ACL. If the Council elects to change the way the LAGC IFQ vessels are allocated from 5.5% of the ACL to 5.5% of the projected landing, the IFQ quota will be lower in FY2017 and initial allocations based on the default measures will likely need to be adjusted.

If FW28 is not adopted these default allocations would remain in place for all of FY2017 and beyond until replaced by a subsequent action.

Table 3 – Summary of ACL related values for the scallop fishery based on default FY 2016 values in FW27.

	2017 (default)	
	MT	lbs.
OFL	68,418	150,835,870
ABC/ACL (discards removed)	37,852	83,449,375
incidental	23	50,000
RSA	567	1,250,000
OBS	379	835,552
ACL for fishery	36,884	81,315,314
LA ACL	34,855	76,842,134
LAGC ACL	2,029	4,473,180
LAGC IFQ	1,845	4,067,529
LA with LAGC IFQ	184	405,650

Table 4 –Summary of FW27 default measures for LA vessels.

Fishing Year	Full Time (FT) LA DAS	Part Time (PT) LA DAS	LA Occasional DAS
2017	34.55	13.82	2.88
Note: FY2017 default measures set DAS and LAGC IFQ allocations equal to the 2016 allocations. One Mid-Atlantic Access Area trip is available on April 1 at 17,000lbs.			

2.0 MANAGEMENT ALTERNATIVES UNDER CONSIDERATION

2.1 OVERFISHING LIMIT AND ACCEPTABLE BIOLOGICAL CATCH

The MSA was reauthorized in 2007. Section 104(a) (10) of the Act established new requirements to end and prevent overfishing, including annual catch limits (ACLs) and accountability measures (AMs). Section 303(a)(15) was added to the MSA to read as follows: ‘‘establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.’’ The Council adopted Scallop Amendment 15 to comply with these new ACL requirements, and that action was implemented in 2011.

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 determination of ABC will consider scientific uncertainty and the Council may not exceed the fishing level recommendations of its Science and Statistical Committee (SSC) in setting ACLs (Section 302(h)(6)). The MSA enhanced the role of the SSCs, mandating that they shall provide ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch (MSA 302(g(1)(B)). This requirement for an SSC recommendation for ABC was effective in January 2007.

2.1.1 Alternative 1 – No Action for OFL and ABC

Under “No Action”, the overall OFL and ABC would be equivalent to default 2017 values adopted in Framework 27 (Table 5) that were calculated for FY2016 and FY2017 based on survey and fishery data through 2015. These would remain in place until a subsequent action replaced them. These values were selected based on the same control rules: 1) OFL is equivalent to the catch associated with an overall fishing mortality rate equivalent to Fmsy; and 2) ABC is set at the fishing mortality rate with a 25% chance of exceeding OFL where risk is evaluated in terms of the probability of overfishing compared to the fraction loss to yield. These values include estimated discard mortality. Therefore, when the fishery specifications are set based on these limits, the estimate of discard mortality is removed first and allocations are based on the remaining ABC available (Table 5, column to the far right).

Table 5 - Summary of OFL and ABC FY 2017 (default) values approved by the SSC in Framework 27 (in metric tons).

	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2017 (default)	68,418	55,737	17,885	37,852

Once the OFL and ABC are established, associated ACLs for the fishery can be defined. The table below summarizes the various ACL allocations for the fishery under 2017 default measures in Framework 27 (Table 6).

Table 6 – Summary of ACL related values for the scallop fishery based on default FY 2016 values in FW27.

	2017 (default)	
	MT	lbs.
OFL	68,418	150,835,870
ABC/ACL (discards removed)	37,852	83,449,375
incidental	23	50,000
RSA	567	1,250,000
OBS	379	835,552
ACL for fishery	36,884	81,315,314
LA ACL	34,855	76,842,134
LAGC ACL	2,029	4,473,180
LAGC IFQ	1,845	4,067,529
LA with LAGC IFQ	184	405,650

2.1.2 Alternative 2 – Updated OFL and ABC for FY 2017 and FY 2018 (default)

Alternative 2 would specify OFLs and ABCs for FY 2017 and set default values for FY 2018 based on the SSC recommendation. The PDT presented updated values and recommended that same baseline OFL and ABC values be used for both 2017 and 2018. The PDT also recommended that the OLF and ABC be prorated to account for a 13-month fishing year in 2017.

While biomass is expected to increase in 2018, the PDT is concerned that the current configuration of the model may lead to an overestimation of the growth of juvenile scallops, particularly in areas where scallops have not historically settled. The PDT applied finer-scale estimates of growth and weight in the model this year to account for anomalously slow growth, specifically in portions of the Nantucket Lightship area, and reduced the maximum growth potential for animals in an area. The result of these changes is a reduction in estimated biomass.

In addition to uncertainty related to the assumptions of natural mortality and anomalous growth, there is also uncertainty related to the estimates of biomass. In 2016 there were multiple surveys conducted, including intensive surveys in some areas that contained high densities of small scallops. There is uncertainty in the survey biomass estimates where in some cases, variation between estimates is considerable. Some variation in survey biomass estimates can be expected because survey methods and coverage levels vary by area, however the PDT feels that the divergence of the estimates in 2016 cannot be explained by this alone

There are practical reasons why it may not be advantageous to have the ABC increase in 2018. Framework 28 is a one year action and the OFL and ABC estimates will be reviewed again next year. Therefore, FY2018 is default only and will be in place at the start of the fishing year (currently March 1) until a subsequent action replaces it. Some fishery specifications are determined directly from the ABC/ACL value (i.e. general category IFQ and observer set-aside). The PDT recommends that precaution should be taken when considering out year projections given the anomalous slow growth of scallops in portions of the Nantucket Lightship area, which is driving the large increase in overall projected biomass in 2018. Overly optimistic default allocations (2018) will need to be reduced if greater than next year's ABC recommendation. This can have negative impacts and cause confusion for fisheries managers and participants in the fishery.

Table 7 - SSC recommendations of FY2017 and FY2018 OFLs and ABCs (upper bound).

	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2017	75,485	61,741	15,004	46,737
2018 (default)	69,678	56,992	13,850	43,142

Once OFL and ABC are established, associated ACLs for the fishery can be defined. The table below summarizes the various ACL allocations for the fishery based on decisions made in Amendment 15 when ACLs were implemented (Table 8).

Table 8 – Summary of ACL related values for the scallop fishery based on update 2017 and 2018 OFL and ABCs shown in Section 2.1.2.

	2017		2018 (default)	
	MT	lbs	MT	lbs
OFL	75,485	166,415,938	69,678	153,613,695
ABC/ACL	46,737	103,037,447	43,142	95,111,829
Incidental	23	50,706	23	50,706
RSA	567	1,250,021	567	1,250,021
Observer Set-Aside	467	1,030,374	431	951,118
ACL for fishery	45,680	100,706,346	42,121	92,859,983
LA ACL	43167	95,167,497	39804	87,752,684
LAGC IFQ ACL	2512	5,538,849	2317	5,107,299
LAGC IFQ	2284	5,035,317	2106	4,642,999
LA w/GC IFQ	228	503,532	211	464,300
LA ACT	Varies Based on the Specification Alternative Selected			

2.2 NORTHERN GULF OF MAINE TOTAL ALLOWABLE CATCH (NGOM TAC)

2.2.1 Alternative 1 – No Action (Default measures from Framework 27)

The NGOM hard TAC would be set at 70,000 pounds. Note that this TAC will be reduced by a roughly 20,000 lb overage from FY2015 and FY2016. The realized TAC under this option would likely be around 50,000 lbs.

2.2.2 Alternative 2 – NGOM TAC based on 2016 survey results and FY2016 catch ratio.

The NGOM hard TAC would be set using biomass estimates from the 2016 survey and FY 2016 landings data from the LAGC IFQ, LAGC NGOM, and LA components. The TAC would be determined by multiplying the ratio of General Category/Limited Access landings with a range of biomass estimates using an F=0.2, and a dredge efficiency equal to 0.4. General category catch by IFQ and NGOM permits accounted for 23% of the landings attributed to the NGOM management area in FY 2016. With respect to biomass estimates, the scallop PDT recommended

using values no higher than the 25th quartile. Four sub-options have been developed in this action.

Table 9 - Range of potential NGOM TAC values for FY2017 (lbs)

Column	*A*	*B*	*C*
	Percentile	Biomass estimate	NGOM TAC (column *B* x 23%)
Status Quo			**70,000**
Sub-Option 1	15th %	411,048	**95,000**
Sub-Option 2	25th %	480,428	**111,000**

2.2.2.1 Sub-Option 1 – NGOM hard TAC of 95,000 pounds

The NGOM hard TAC would be set at 95,000lbs using the method described above in Section 2.2.2. This TAC value is associated with biomass estimate at the 15th percentile, assuming an F=0.2 and a dredge efficiency of 0.4. Note that this TAC will be reduced by a roughly 20,000 lb overage from FY2015 and FY2016. The realized TAC under this option would likely be around 75,000 lbs.

2.2.2.2 Sub-Option 2 – NGOM hard TAC of 111,000 pounds

The NGOM hard TAC would be set at 111,000lbs using the method described above in Section 2.2.2. This TAC value is associated with biomass estimate at the 25th percentile, assuming an F=0.2 and a dredge efficiency of 0.4. Note that this TAC will be reduced by a roughly 20,000 lb overage from FY2015 and FY2016. The realized TAC under this option would likely be around 91,000 lbs.

2.3 APPLYING SPATIAL MANAGEMENT TO THE SPECIFICATION SETTING PROCESS (ACL FLOWCHART)

Annual catch limits (ACLs) in the scallop fishery are based on the overall biomass (projected landings at F=0.38 in all areas, including closed areas), while projected landings are limited to the harvestable biomass in areas that are open to the fishery in a given year. The ACL split for the LA and LAGC fisheries are consistent with decisions made in Amendment 11 (94.5% to the LA fishery and 5.5% to the LAGC fishery). Since Amendment 15 (A15), the LAGC IFQ allocation has been based on scallop projected landings at F=0.38 in all areas, including closed areas, and the LA allocation has been based on projected landings for the fishing year, after accounting for the research set-aside, observer set-aside, incidental landings, and the LAGC IFQ share (5.5% of the ACL). In this way, the allocation to LA is spatially explicit, while the LAGC IFQ allocation is not.

The Council may select either Section 0 (No Action) or Section 0 (Alternative 2). Once the Council has identified a preferred, the range of fishery specifications will be limited to those associated with either No Action or Alternative 2. In FW28, the specification options and component allocations are part of this measure. See Section 4.1.5 for additional information on allocations and landings.

Table 10 - Range of Specification Options under 2.3.1 (Status Quo) and 2.3.2 (Spatial Management), including the allocations and percent share of projected landings between the LA component and the LAGC IFQ component.

FY2017, 12 month fishing year										
	Approach to setting Specifications	No Action (IFQ at 5.5% of ACL) **Section 2.3.1**				Applying Spatial Management to Spec Setting (IFQ at 5.5% of PL) **Section 2.3.2**				
						Basic Run Options		Basic Run + ETC Flex Options		
a	FW 28 Measure	2.3.1.1.1	2.3.1.1.2	2.3.1.1.4	2.3.1.1.3	2.3.2.1.1.1	2.3.2.1.1.2	2.3.2.1.2.1	2.3.2.1.2.2	2.3.2.1.2.3
b	Description	Basic Run and 30 DAS	Basic Run + ETC Flex at 30 DAS	Status Quo From FY2016 (FW27)	No Action	Basic Run and 30 DAS	Basic Run and DAS set at F=0.4	Basic Run + ETC Flex at 30 DAS	Basic+ETC Flex and DAS set at F=0.4	Basic+ETC Flex+NLS and DAS set at F=0.44
c	Run	2. Basic Run GCSQ	7. ETCGC SQ	SQ	1. No Action	3. Basic Run GCP	4. OpF=0.4	6. ETC		ETC+NLSext F=0.44
d	Landings (mil lbs)	52.4	52.4	47.7	35.6	49.2	47.3	49.2	47.3	46.5
e	Incidental Catch	50,000 lbs	50,000 lbs	50,000 lbs	50,000 lbs	50,000 lbs	50,000 lbs	50,000 lbs	50,000 lbs	50,000 lbs
f	RSA Set-Aside	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs	1.25 mil. Lbs
g	Observer Set-Aside	1 mil. Lbs	1 mil. Lbs	1 mil. Lbs	835,000 lbs	1 mil. Lbs	1 mil. Lbs	1 mil. Lbs	1 mil. Lbs	1 mil. Lbs
h	IFQ Quota (% share)	5.5 mil (10.5%)	5.5 mil (10.5%)	4.4 mil. (9.4%)	4.4 mil. (12.5%)	2.58 mil. (5.5%)	2.47 mil. (5.5%)	2.58 mil. (5.5%)	2.47 mil. (5.5%)	2.43 mil. (5.5%)
i	LA Allocation (% Share)	44.5 mil (85%)	44.5 mil (85%)	41 mil. (86.1%)	29 mil (81.5%)	44.3 mil. (94.5%)	42.5 mil (94.5%)	44.3 mil. (94.5%)	42.5 mil (94.5%)	41.7 mil. (94.5%)
j	FT LA DAS	30	30	34.55	34.55	30	27.56	30	27.56	29.18
k	PT LA DAS	12	12	13.82	13.82	12	11.04	12	11.04	11.67
l	Total AA mt	12169	12170			11037	11037	11038	11038	11038
m	Total AA lbs (mil. Lbs)	26.8	26.8			24.3	24.3	24.3	24.3	24.3
n	FT AA Allocation	72000	72000	51000	17000	72000	72000	72000	72000	72000
o	(poss limit)	18000	18000	17000	17000	18000	18000	18000	18000	18000
p	PT AA Allocation	28800	28800	20400	10200	28800	28800	28800	28800	28800
q	(poss limit)	14400	14,400	10200	10200	14400	14400	14400	14400	14400
r	MAAA	Open	Open	Open	Open	Open	Open	Open	Open	Open
s	ETC Rotational	Closed	Open*	Closed	Closed	Closed	Closed	Open*	Open*	Open*
t	NLS	Open	Open	Closed**	Closed	Open	Open	Open	Open	Open
u	CA II	Open	Open	Closed	Closed	Open	Open	Open	Open	Open
	* Seasonal closure from July 1 - September 30									
	** Same access as FY2016									
Options for Allocations Based on a 13 Month FY (Section 2.4). Increase by 8% is based on additional length of year (13/12ths), Increase by 4.7% is based on recent DAS and IFQ quota usage in March. Values below represent the total allocations for FY2017 based on pro-rating for a 13 month FY. Access Area allocations will not be pro-rated.										
v	13 Month LA DAS (8%)	32.4	32.4	37.314	37.314	32.4	29.7648	32.4	29.7648	31.51
w	13 Month IFQ (8%)	5.64 mil. Lbs	5.64 mil. Lbs	4.58 mil. Lbs	4.58 mil. Lbs	2.69 mil. Lbs	2.57 mil. Lbs	2.69 mil. Lbs	2.57 mil. Lbs	2.53 mil. lbs
x	13 Month LA DAS (4.7%)	31.41	31.41	36.17385	36.17385	31.41	28.85532	31.41	28.85532	30.55
y	13 Month IFQ (4.7%)	5.6 mil. lbs	5.6 mil. lbs	4.55 mil. lbs	4.55 mil. lbs	2.64 mil. Lbs	2.53 mil. Lbs	2.64 mil. Lbs	2.53 mil. Lbs	2.49 mil. Lbs
NOTE: All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.										

2.3.1 Alternative 1 – Status Quo

There would be no change to the current process of specifying allocations of projected landings to the LA and LAGC IFQ components of the fishery. The LAGC IFQ component would receive 5.5% of the ACL. The LA component would be based on projected landings for the fishing year, after accounting for the research set-aside, observer set-aside, incidental landings, and the LAGC IFQ share (5.5% of the ACL).

Rationale: The Council developed a structure to set OFLs, ABCs, and ACLs in the scallop FMP in Amendment 15 to come into compliance with the reauthorization of the Magnuson-Stevens Act. In that process the Council specified that the annual allocation to the LAGC IFQ component would be based on the LAGC IFQ ACL. Prior to this decision, the IFQ allocations had been set at 5.5% of the projected fishery landings (Amendment 11).

2.3.1.1 Overall Fishery Allocations under Status Quo

2.3.1.1.1 Alternative 1 – Basic Run

This is the basic alternative the PDT generally begins with when identifying possible specification alternatives. The overall intent of this alternative is to set target catches using the three principles developed as part of the "hybrid" overfishing definition approved in Amendment 15, and not include additional closures or modifications to boundaries of the overall area rotation program. The three main principles that are generally used in this FMP to set target catches for the fishery are:

1) fishing mortality in open areas cannot exceed Fmsy;
2) a spatially averaged fishing mortality target is limited to the landings associated with the annual catch target (ACT) for the fishery overall from all areas combined (open and closed areas); and
3) fishing mortality targets for access areas are based on a time-averaged principle, higher F in some years followed by closures or limited fishing levels in other years.

The maximum that the annual catch target can be set at is the catch associated with applying a fishing mortality rate of 0.34 overall, 0.04 below ABC/ACL, currently estimated at 0.38, to account for management uncertainty. But in reality some areas are closed and not available to the scallop fishery. Therefore, in practice, the projected catch associated with ACT cannot exceed 0.34 overall, but target catches are actually driven by the three overall principles developed as part of the "hybrid" overfishing definition approved in Amendment 15 (F in open areas cannot exceed Fmsy; F in access areas set annually at a level that results in F no higher than Fmsy when averaged over time; and the combined target F in open, access, and closed areas cannot exceed F associated with ACT, currently 0.34). In a given year, one of these three principles will be the constraining element that dictates what the ultimate target F is for a particular alternative, in many cases below ACT (0.34). For example, for FY2017 under this alternative, the constraining factor for setting projected catches is the open area max of 0.48. The overall estimate of F combined from all areas open and closed under this alternative is 0.11.

The intent of this alternative is to reduce discard and incidental mortality on small scallops observed in several areas during the 2016 survey season. This alternative would maintain the existing Closed Area II Extension Rotational Closed Area and the Elephant Trunk Rotational Closed Areas, while converting the existing "bump out" in the Nantucket Lightship Rotational

Closure to open bottom. Maintaining the existing Closed Area II Extension Rotational Closed Area and the Elephant Trunk Rotational Closed Areas is likely to increase yield-per-recruit for the fishery in coming years.

The specific allocations associated with this specification alternative are:

- Total FY2017 projected catch for this alternative is 52.4 million pounds (from all sources of catch and areas) assuming 30 DAS.
- LA sub-ACL would be 95,167,497 pounds and the LAGC IFQ sub-ACL is 5,538,849 pounds (based on 13 month FY prorated at 13/12ths).
- 30.00 DAS for LA FT vessel, 12.00 DAS for LA PT vessel, and 2.50 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.
- Access areas open to the fishery under this alternative are: the Mid-Atlantic Access Areas (2 trips), Closed Area 2 South (1 trip), and the Nantucket Lightship (1 trip). Each LA FT vessels would be allocated 72,000 pounds (18,000 per AA area trip, trip limit).
- PT and Occ AA allocations would be set at 28,800 pounds for PT and 6,000 pounds for occasional vessels. PT vessels trip limit would be 14,400 lbs, PT vessels must take at least 1 trip in the MAAA, and may take the second trip in any other open AAs. Occ vessels would be eligible to fish their 6,000 lb trip in any AA area open to the fishery.
- LAGC Incidental target TAC remains at 50,000 pounds.
- The Closed Area II Extension Rotational Closed Area (Closed in FW27), would remain closed.
- The Elephant Trunk Rotational Closed Area would remain closed.

2.3.1.1.2 Alternative 2 – Basic Run and Elephant Trunk Closed Flex Option

This alternative maintains all of the provisions from Alternative 1, but handles access within the Mid-Atlantic Access Area differently. In Alternative 2, the Elephant Trunk Rotational Closure would become an access area. LA vessels would have the option to fish an access area trip in this area, or they could elect to fish that trip in the Mid-Atlantic access area. This option would allow the LA fishery to more broadly distribute their effort within Mid-Atlantic access areas. Dredge and HabCam surveys of the Elephant Trunk area indicate that the majority of the biomass in the area is concentrated within the rotational closure. Size frequency plots from HabCam data also suggest that there are several cohorts of varying sizes (recruits and pre-recruits) in the Rotational Closure. The overall intent of this alternative is to reduce discard and incidental mortality on small scallops by distributing effort that would have been fished in the MAAA into an area with known concentrations of pre-recruits and exploitable animals. Access to the Elephant Trunk Rotational Closure/Access Area would be prohibited from July 1 – September 30 to reduce discard mortality, and vessels would be limited to 1 VMS declaration into the area.

The specific allocations associated with this specification alternative are:

- Total FY2017 projected catch for this alternative is 52.4 million pounds (from all sources of catch and areas)
- LA sub-ACL would be 95,167,497 pounds and the LAGC IFQ sub-ACL is 5,538,849 pounds (based on 13 month FY prorated at 13/12ths).

- 30.00 DAS for LA FT vessel, 12.00 DAS for LA PT vessel, and 2.50 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.
- Access areas open to the fishery under this alternative are: the Mid-Atlantic Access Areas (1 trip), Elephant Trunk Rotational (Closure) Area (1 trip), Closed Area 2 South (1 trip), and the Nantucket Lightship (1 trip). Each LA FT vessels would be allocated 72,000 pounds (18,000 per AA area trip, trip limit).
- PT and Occ AA allocations would be set at 28,800 pounds for PT and 6,000 pounds for occasional vessels. PT vessels trip limit would be 14,400 lbs. PT vessels must take at least 1 trip in the MAAA, and may take the second trip in any other open AAs. Occ vessels would be eligible to fish their 6,000 lb trip in any AA area open to the fishery.
- The Closed Area II Extension Rotational Closed Area (Closed in FW27), would remain closed.
- There would be a seasonal closure of ETC area from July 1 – September 30.
- LAGC Incidental target TAC remains at 50,000 pounds.

2.3.1.1.3 Alternative 3 – No Action (Default measures from Framework 27)

Under No Action, the sub-ACL for the LA fishery would be 34,855 mt (76,842,134 lbs). The specifications would include default measures approved in Framework 27 for DAS which are 100% of the projected DAS for FY2016. For full-time vessels that is equivalent to 34.55 DAS, and 13.82 DAS for part-time vessels. The LA component would have some access to the MA access area, the equivalent of one 17,000 pound trip for FT vessels. However, the area would not open for now 2017 allocations until April 1, 2017. These measures would remain in place until replaced by another action.

Under the FY2017 default measures the LAGC IFQ allocation would be 2,029 mt (4,473,180 lbs) for LAGC IFQ and LA with LAGC IFQ quota. This allocation is equivalent to 5.5% of the ACL projected for FY2017 from FW27. LAGC IFQ vessels would also have access in the MA AA on April 1, 2017 under default measures, with a fleet wide maximum of 851 trips from the area.

On March 1, 2017 LAGC vessels will be allocated an individual quota based on default measures that will likely be different than the allocation LAGC IFQ vessels will ultimately be allocated under FW28. Similar to recent years, LAGC vessels will need to be aware that final allocations for FY2017 are likely to be different than allocations received on March 1, 2016 before FW28 is implemented.

The target TAC for vessels with a LAGC Incidental permit is 50,000 pounds.

2.3.1.1.4 Status Quo Management Measures (FY2017 Measures from FW 27)

The status quo measures from FW27 are described below for comparison purposes only. This is not an option in the document, but rather a baseline to compare results of potential measures to. In FW27, the overall intent of this option was to reduce discard and incidental mortality on small scallops observed in Closed Area II S access area, the Closed Area II Extension Rotational Closure, the Nantucket Lightship Rotational Closed Area (LA only), and the Elephant Trunk Rotational Closure.

The specific allocations associated with this specification alternative are:

- Total FY2017 projected catch for this alternative is 47.7 million pounds (from all sources of catch and areas)
- LA sub-ACL is 76,842,134 pounds and the LAGC IFQ sub-ACL is 4,473,180 pounds
- 34.69 DAS for LA FT vessel, 13.88 DAS for LA PT vessel, and 2.92 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels. Therefore, the final allocations would be 34.55 for LA FT vessels and 13.82 for LA PT vessels.
- Only the Mid-Atlantic Access Areas would be open to the LA component of the fishery. Each LA FT vessels would be allocated 51,000 pounds, 20,400 pounds for PT and 4,080 pounds for occasional vessels. All other access areas would be closed to the fishery under this alternative (CA1 and NL).
- LAGC IFQ vessels would be allocated AA trips to the MAAA (2068 trips) and the NLS (485 trips).
- The target TAC for vessels with a LAGC Incidental permit is 50,000 pounds.

2.3.1.1.5 Default measures for 2018

The Scallop Committee recommends that default measures for the limited access fishery include DAS at 75% of the projected DAS allocation for 2017, and one access area trip in the MAAA at 18,000 for FT LA vessels. The Scallop Committee also recommends that LAGC IFQ allocations be set at 75% of the 2017 quota at the start of the fishing year, and that LAGC IFQ access area trips be set at 5.5% of the total access area allocation for default measures. These trips would only be available in the MAAA.

2.3.1.2 Fishery Allocations to LAGC IFQ Component

The LAGC IFQ fishery is allocated a fleet wide 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 are 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. The level of allocation can vary and is specified in each framework action. This action is considering several allocation options, as well as several area options depending on which areas are open to the scallop fishery in FY2017. In addition to No Action, the PDT developed…

2.3.1.2.1 Allocation of LAGC IFQ Trips in Access Areas

2.3.1.2.1.1 Alternative 1 – No Action (851 trips – Default Measures)

Alternation 1 would set LAGC IFQ access area trips at 851 trips, which is the number of trips specified through default measures in FW27.

2.3.1.2.1.2 Alternative 2 – Same AA Proportion as LA (51%, 4,723 trips)

This alternative is based on applying the same proportion of total catch coming from access areas for the overall fishery. For example, under both Alternative 1 and Alternative 2, 51% of the total projected catch is from access areas and 49% is from open areas. Therefore, the same 51% is applied to the overall LAGC IFQ allocation that equates to about 2.8 million pounds or 4,723

trips at 600 pounds per trip. This is the method that was used in Framework 26 and Framework 27.

2.3.1.2.1.3 Alternative 3 – 5.5% of the Access Area Allocations (2,459 trips)

This option is based on applying the same allocation value for the overall ABC/ACL, which is 5.5% for the LAGC fishery. When 5.5% is applied to the overall access area allocations for FY2017, that equates to about 1.475 million pounds or 2,459 trips. This method has been used in previous actions.

2.3.1.2.2 LAGC IFQ Allocations (by area)

2.3.1.2.2.1 Alternative 1 – Equal Distribution to All Access Areas

This option would allocate LAGC IFQ AA trips to all open AAs. In practice, 25% of the total number of LAGC IFQ trips would be associated with each of the four FT LA AA trips under consideration. For the Basic Run, where two AA trips are allocated to the MAAA, a total of 50% of the LAGC IFQ trips would be allocated to the area. For the Basic Run with the Elephant Trunk Flex Option, 25% of the total trips would go to each of the access areas: MAAA, ET AA, NLS AA, and CA II S AA.

2.3.1.2.2.2 Alternative 2 – Equal distribution based to all Access Areas, and Prorate the Equivalent of CA II trips evenly other Access Areas.

This option would allocated LAGC IFQ AA trips equally to all open access areas, and prorate LAGC CA II AA trip allocation evenly across all other open access areas (NLS, MAAA, and potentially the ETC).

2.3.1.2.2.3 Alternative 3 – Equal distribution based to all Access Areas, and Prorate the Equivalent of CA II trips 50% to NLS and 50% to MAAA/ETC.

This option would allocated LAGC IFQ AA trips equally to all open access areas, and prorate LAGC IFW CAII AA trip allocations by 50% to the NLS AA, and 50% to the MAAA/ETC AA.

2.3.2 Alternative 2 – Fishery allocations based on spatial management

The allocation of projected landings between the LA and LAGC IFQ components would follow the spatial management of the fishery. The LA component would receive 94.5% of the projected landings from areas open to the fishery, and the LAGC IFQ component would receive 5.5% of the projected landings from areas open to the fishery, after set-asides (RSA and observer) and incidental landings are accounted for. Because the ACL in the scallop fishery is based on exploitable animals from the overall biomass, and projected landings are based on spatial management for a given fishing year, the allocations for both components would be capped at either the ACT for the LA component, or the sub-ACL for the LAGC IFQ component.

Rationale: Basing allocations for both the LA and LAGC IFQ components on projected landings better reflects the area based management used in the scallop fishery. This approach would consistently allocate 94.5% of allocations to the LA component, and 5.5% to the LAGC IFQ component.

2.3.2.1 Overall Fishery Allocations under Spatial Management

For all of the specification alternatives below, the LA and LAGC IFQ allocations would be based on projected landings.

2.3.2.1.1 Alternative 1 – Basic Run

This is the basic alternative the PDT generally begins with when identifying possible specification alternatives. The overall intent of this alternative is to set target catches using the three principles developed as part of the "hybrid" overfishing definition approved in Amendment 15, and not include additional closures or modifications to boundaries of the overall area rotation program. The three main principles that are generally used in this FMP to set target catches for the fishery are:

4) fishing mortality in open areas cannot exceed Fmsy;
5) a spatially averaged fishing mortality target is limited to the landings associated with the annual catch target (ACT) for the fishery overall from all areas combined (open and closed areas); and
6) fishing mortality targets for access areas are based on a time-averaged principle, higher F in some years followed by closures or limited fishing levels in other years.

The maximum that the annual catch target can be set at is the catch associated with applying a fishing mortality rate of 0.34 overall, 0.04 below ABC/ACL, currently estimated at 0.38, to account for management uncertainty. But in reality some areas are closed and not available to the scallop fishery. Therefore, in practice, the projected catch associated with ACT cannot exceed 0.34 overall, but target catches are actually driven by the three overall principles developed as part of the "hybrid" overfishing definition approved in Amendment 15 (F in open areas cannot exceed Fmsy; F in access areas set annually at a level that results in F no higher than Fmsy when averaged over time; and the combined target F in open, access, and closed areas cannot exceed F associated with ACT, currently 0.34). In a given year, one of these three principles will be the constraining element that dictates what the ultimate target F is for a particular alternative, in many cases below ACT (0.34). For example, for FY2017 under this alternative, the constraining factor for setting projected catches is the open area max of 0.48. The overall estimate of F combined from all areas open and closed under this alternative is 0.11.

The intent of this alternative is to reduce discard and incidental mortality on small scallops observed in several areas during the 2016 survey season. This alternative would maintain the existing Closed Area II Extension Rotational Closed Area and the Elephant Trunk Rotational Closed Areas, while converting the existing "bump out" in the Nantucket Lightship Rotational Closure to open bottom. Maintaining the existing Closed Area II Extension Rotational Closed Area and the Elephant Trunk Rotational Closed Areas is likely to increase yield-per-recruit for the fishery in coming years.

The specific allocations associated with this specification alternative are:

- Total FY2017 projected catch for this alternative is between either 47.3 or 49.2 million pounds (from all sources of catch and areas), depending on the DAS options that may be selected.
- LA sub-ACL would be 95,167,497 pounds and the LAGC IFQ sub-ACL is 5,538,849 pounds (based on 13 month FY prorated at 13/12ths).
- Access areas open to the fishery under this alternative are: the Mid-Atlantic Access Areas (2 trips), Closed Area 2 South (1 trip), and the Nantucket Lightship (1 trip). Each LA FT vessels would be allocated 72,000 pounds (18,000 per AA area trip, trip limit).
- PT and Occ AA allocations would be set at 28,800 pounds for PT and 6,000 pounds for occasional vessels. PT vessel's trip limit would be 14,400 lbs, PT vessels must take at least 1 trip in the MAAA, and may take the second trip in any other open AAs. Occ vessels would be eligible to fish their 6,000 lb trip in any AA area open to the fishery.
- LAGC Incidental target TAC remains at 50,000 pounds.
- The Closed Area II Extension Rotational Closed Area (Closed in FW27), would remain closed.
- The Elephant Trunk Rotational Closed Area would remain closed.

2.3.2.1.1.1 Sub-Option 1 – Basic Run with DAS set at 30 DAS (F=0.44)

This sub-option would set the DAS at 30 for the FT LA component, which would result in an open area F=0.44.

- Projected landings of 49.2 million pounds.
- 30.00 DAS for LA FT vessel, 12.00 DAS for LA PT vessel, and 2.50 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.
- The LAGC IFQ Quota would be approximately 2.58 million pounds.

2.3.2.1.1.2 Sub-Option 2 – Basic Run with DAS set at F=0.40

Sub-Option 2 would set the FT LA DAS at 27.56, which is expected to result in an F=0.4 in the open areas.

- Projected landings of 47.3 million pounds
- 27.56 DAS for LA FT vessel, 11.02 DAS for LA PT vessel, and 2.30 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.

- The LAGC IFQ Quota would be approximately 2.47 million pounds.

Table 11 - Comparison of DAS sub-options associated with Alt. 1 Basic Run

	F rate	FT	PT	Occ	LAGC IFQ
Sub-Option 1	F=0.44	30.00	12.00	2.50	2,579,320
Sub-Option 2	F=0.40	27.56	11.02	2.30	2,471,161

2.3.2.1.2 Alternative 2 – Basic Run with Elephant Trunk Closed Flex Option

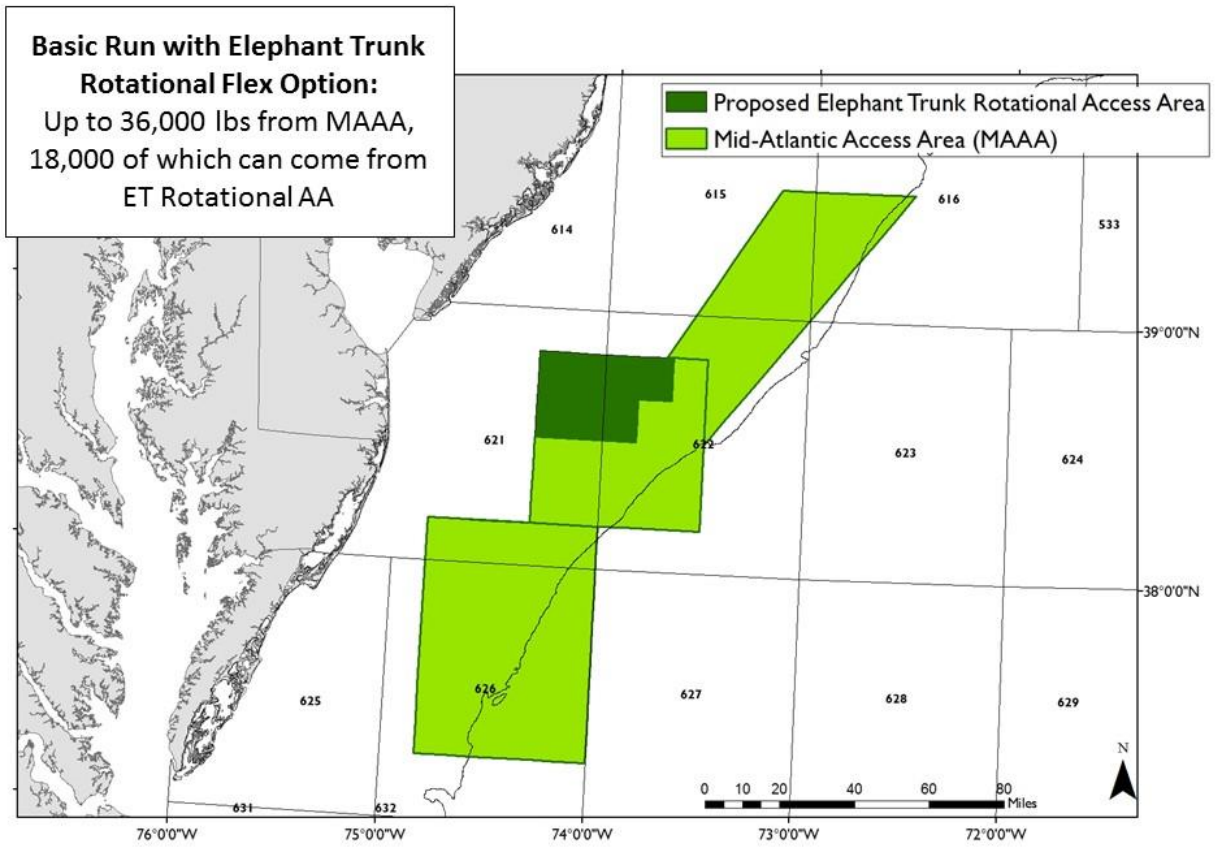
This alternative maintains all of the provisions from Alternative 1, but handles access within the Mid-Atlantic Access Area differently. In Alternative 2, the Elephant Trunk Rotational Closure would become an access area. LA vessels would have the option to fish an access area trip in this area, or they could elect to fish that trip in the Mid-Atlantic access area. This option would allow the LA fishery to more broadly distribute their effort within Mid-Atlantic access areas. Dredge and HabCam surveys of the Elephant Trunk area indicate that the majority of the biomass in the area is concentrated within the rotational closure. Size frequency plots from HabCam data also suggest that there are several cohorts of varying sizes (recruits and pre-recruits) in the Rotational Closure. The overall intent of this alternative is to reduce discard and incidental mortality on small scallops by distributing effort that would have been fished in the MAAA into an area with known concentrations of pre-recruits and exploitable animals. Access to the Elephant Trunk Rotational Closure/Access Area would be prohibited from July 1 – September 30 to reduce discard mortality, and vessels would be limited to 1 VMS declaration into the area.

The specific allocations associated with this specification alternative are:

- Total FY2016 projected catch for this alternative would range from 46.5 million pounds – 49.2 million pounds depending on the DAS sub-option that is selected. (from all sources of catch and areas)
- LA sub-ACL would be 95,167,497 pounds and the LAGC IFQ sub-ACL is 5,538,849 pounds (based on 13 month FY prorated at 13/12ths).
- Access areas open to the fishery under this alternative are: the Mid-Atlantic Access Areas (1 trip), Elephant Trunk Rotational Access Area (1 trip), Closed Area 2 South (1 trip), and the Nantucket Lightship (1 trip). Each LA FT vessels would be allocated 72,000 pounds (18,000 per AA area trip, trip limit). Elephant Trunk Rotational Access Area trips would be tradeable with Nantucket Lightship or Closed Area II Access Area trips.
- FT LA vessels would be allowed to harvest up to 36,000 lbs from the Mid-Atlantic Access Area, 18,000 lbs of which may come from the Elephant Trunk Rotational Access Area.
- PT and Occ AA allocations would be set at 28,800 pounds for PT and 6,000 pounds for occasional vessels. PT vessels trip limit would be 14,400 lbs. PT vessels must take at least 1 trip in the MAAA, and may take the second trip in any other open AAs. Occ vessels would be eligible to fish their 6,000 lb trip in any AA area open to the fishery.
- The Closed Area II Extension Rotational Closed Area (Closed in FW27), would remain closed.
- There would be a seasonal closure of ETC Rotational Access Area from July 1 – September 30.

- LAGC Incidental target TAC remains at 50,000 pounds.

Figure 2 - Proposed configuration of the Mid-Atlantic Access Area and Elephant Trunk Rotational Access Area



2.3.2.1.2.1 Sub-Option 1 – DAS set at 30 DAS (F=0.44)

This sub-option would set the DAS at 30 for the FT LA component, which would result in an open area F=0.44.

- 30.00 DAS for LA FT vessel, 12.00 DAS for LA PT vessel, and 2.50 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.
- The LAGC IFQ Quota would be approximately 2.58 million pounds.

2.3.2.1.2.2 Sub-Option 2 – DAS set at F=0.40

Sub-Option 2 would set the FT LA DAS at 27.56, which is expected to result in an F=0.4 in the open areas.

- Projected landings of 47.3 million pounds
- 27.56 DAS for LA FT vessel, 11.02 DAS for LA PT vessel, and 2.30 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided

under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.

- The LAGC IFQ Quota would be approximately 2.47 million pounds.

2.3.2.1.2.3 Sub-Option 3 – Expanded NLS AA with DAS set at F=0.44

Sub-Option 3 would expand the NLS AA to include the NLS extension rotational closure, and calculate open area DAS at F=0.44. The FT LA DAS would be set at 29.18 DAS.

- Projected landings of 46.5 million pounds.
- 29.18 DAS for LA FT vessel, 11.67 DAS for LA PT vessel, and 2.43 DAS for LA occasional vessels. All DAS allocations will be adjusted to allow for flexibility provided under FW26 for vessels to declare out of the fishery at Cape May and steam off the clock. The DAS reduction is 0.14 for FT LA vessels and 0.06 for PT LA vessels.
- The LAGC IFQ Quota would be approximately 2.43 million pounds.

Figure 3 - Nantucket Lightship Access Area Configuration, including the NLS-extension area (in green).

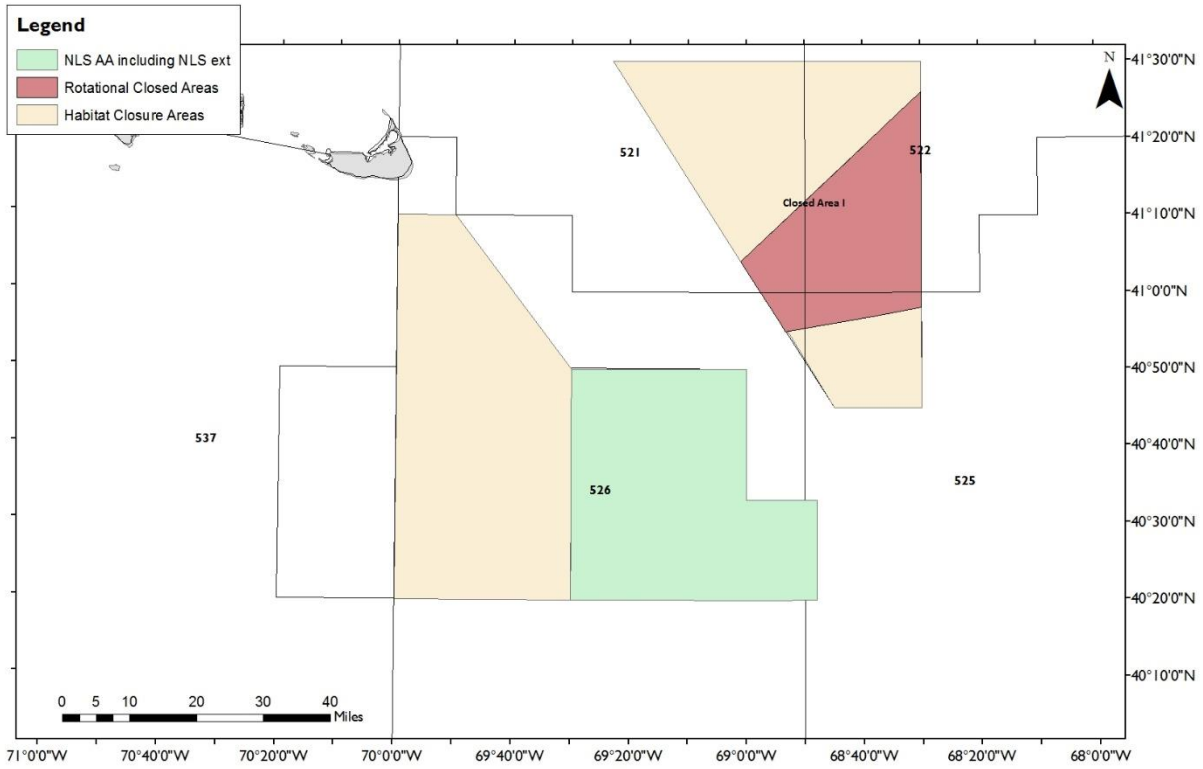


Table 12 - Comparison of DAS sub-options associated with Alt. 2 Basic Run and ETC Flex Option.

	F rate	FT	PT	Occ	LAGC IFQ
Sub-Option 1	F=0.44	30.00	12.00	2.50	2,579,320
Sub-Option 2	F=0.40	27.56	11.02	2.30	2,471,161
Sub-Option 3 (NLS-ext AA)	F=0.44	29.12	11.67	2.43	2,429,571

2.3.2.1.3 Default measures for 2018

The Scallop Committee recommends that default measures for the limited access fishery include DAS at 75% of the projected DAS allocation for 2017, and one access area trip in the MAAA at 18,000 for FT LA vessels. The Scallop Committee also recommends that LAGC IFQ allocations be set at 75% of the 2017 quota at the start of the fishing year, and that LAGC IFQ access area trips be set at 5.5% of the total access area allocation for default measures. These trips would only be available in the MAAA.

2.3.2.2 Fishery Allocations to LAGC IFQ Component

The LAGC IFQ fishery is allocated a fleet wide 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 are 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. The level of allocation can vary and is specified in each framework action. This action is considering several allocation options, as well as several area options depending on which areas are open to the scallop fishery in FY2017. In addition to No Action, the PDT developed…

2.3.2.2.1 Allocation of LAGC IFQ Trips in Access Areas

2.3.2.2.1.1 Alternative 1 – No Action (851 trips – Default Measures)

Alternation 1 would set LAGC IFQ access area trips at 851 trips, which is the number of trips specified through default measures in FW27.

2.3.2.2.1.2 Alternative 2 – Same AA Proportion as LA (Range of 2,106 – 2,125 trips)

This option is based on applying the same proportion of total catch coming from access areas for the overall fishery. For example, under the basic run at 30 DAS, 49% of the total projected catch is from access areas and 51% is from open areas. Therefore, the same 49% is applied to the overall LAGC IFQ allocation that equates to about 1.27 million pounds or 2,125 trips at 600 pounds per trip. This is the method that was used in Framework 26 and Framework 27. The following table describes the range of potential AA trips associated with each DAS sub-option in this section.

Table 13 - Number of LAGC IFQ access area trips associated with each DAS/F rate option in Section 2.3.

Option	FT DAS/F rate	Proportion of total landing from AA	LAGC Trips
Sub-Option 1	30.00 DAS (F=0.44)	49%	2,125
Sub-Option 2	27.56 DAS (F=0.40)	51%	2,120
Sub-Option 3	29.18 DAS (F=0.44)	52%	2,106

2.3.2.2.1.3 Alternative 3 – 5.5% of the Access Area Allocations (2,230 trips)

This option is based on applying the same allocation value for the overall ABC/ACL, which is 5.5% for the LAGC fishery. When 5.5% is applied to the overall access area allocations for

FY2017, that equates to about 1.34 million pounds or 2,230 trips. This method has been used in previous actions.

2.3.2.2.2 LAGC IFQ Allocations (by area)

2.3.2.2.2.1 Alternative 1 – Equal Distribution to All Access Areas

This option would allocate LAGC IFQ AA trips to all open AAs. In practice, 25% of the total number of LAGC IFQ trips would be associated with each of the four FT LA AA trips under consideration. For the Basic Run, where two AA trips are allocated to the MAAA, a total of 50% of the LAGC IFQ trips would be allocated to the area. For the Basic Run with the Elephant Trunk Flex Option, 25% of the total trips would go to each of the access areas: MAAA, ET AA, NLS AA, and CA II S AA.

2.3.2.2.2.2 Alternative 2 – Equal distribution based to all Access Areas, and Prorate the Equivalent of CA II trips evenly other Access Areas.

This option would allocated LAGC IFQ AA trips equally to all open access areas, and prorate LAGC CA II AA trip allocation evenly across all other open access areas (NLS, MAAA, and potentially the ETC).

2.3.2.2.2.3 Alternative 3 – Equal distribution based to all Access Areas, and Prorate the Equivalent of CA II trips 50% to NLS and 50% to MAAA/ETC.

This option would allocated LAGC IFQ AA trips equally to all open access areas, and prorate LAGC IFW CAII AA trip allocations by 50% to the NLS AA, and 50% to the MAAA/ETC AA.

Table 14 - Number of LAGC IFQ Trips by Access Area based on default measures

Default Measures			MAAA	ETC	NLS	CA II S
Option 1 - Equal Shares	**Basic Run**	**# IFQ Trips**	**0.25**	**0**	**0.25**	**0.25**
	30 DAS, F=0.4, F=0.48	851	426	n/a	213	213
	Basic Run w/ ETC Flex	**# IFQ Trips**	**0.25**	**0.25**	**0.25**	**0.25**
	30 DAS, F=0.4, F=0.48	851	213	213	213	213
Option 2 - Equal Shares and Distribute CA II trips Evenly Across AA	**Basic Run**	**# IFQ Trips**	**0.66**	**0**	**0.34**	**0**
	30 DAS, F=0.4, F=0.48	851	562	n/a	289	n/a
	Basic Run and ETC Flex	**# IFQ Trips**	**0.333**	**0.333**	**0.333**	**0**
	30 DAS, F=0.4, F=0.48	851	283	283	283	n/a
Option 3 - Equal Shares and Distribute CA II trips Evenly Between NLS and MAAA/ETC (50/50)	**Basic Run**	**# IFQ Trips**	**0.625**	**0**	**0.375**	**0**
	30 DAS, F=0.4, F=0.48	851	532	n/a	319	n/a
	Basic Run and ETC Flex	**# IFQ Trips**	**0.3125**	**0.3125**	**0.375**	**0**
	30 DAS, F=0.4, F=0.48	851	266	266	319	n/a

Table 15 - Number of LAGC IFQ Trips by Access Area based on Alternative 2, Section 2.3.2.2.1.2, Same AA proportion as LA

Section 2.3.2.2.1.2 Alt. 2 - Same Proportion As LA			**MAAA**	**ETC**	**NLS**	**CA II S**
Section 2.3.2.2.2.1 Alt. 1 - Equal Distribution of Trips to All Access Areas	**Basic Run**	**# IFQ Trips**	**0.25**	**0**	**0.25**	**0.25**
	30 DAS (49% AA landings)	2,125	1,062	n/a	531	531
	F=0.40 (51% AA landings)	2,120	1,060	n/a	530	530
	Basic Run w/ ETC Flex	**# IFQ Trips**	**0.25**	**0.25**	**0.25**	**0.25**
	30 DAS (49% AA landings)	2,125	531	531	531	531
	F=0.40 (51% AA landings)	2,120	530	530	530	530
	NLS F=0.44 (52% AA landings)	2,106	526	526	526	526
Section 2.3.2.2.2.2 Alt. 2 - Equal Shares and Distribute CA II trips Evenly Across AA	**Basic Run**	**# IFQ Trips**	**0.67**	**0**	**0.33**	**0**
	30 DAS (49% AA landings)	2,125	1,424	n/a	701	n/a
	F=0.40 (51% AA landings)	2,120	1,421	n/a	700	n/a
	Basic Run and ETC Flex	**# IFQ Trips**	**0.3333**	**0.3333**	**0.333**	**0**
	30 DAS (49% AA landings)	2,125	708	708	708	n/a
	F=0.40 (51% AA landings)	2,120	707	707	706	n/a
	NLS F=0.44 (52% AA landings)	2,106	702	702	701	n/a
Section 2.3.2.2.2.3 Alt. 3 - Equal Shares and Distribute CA II trips Evenly Between NLS and MAAA/ETC (50/50)	**Basic Run**	**# IFQ Trips**	**0.625**	**0**	**0.375**	**0**
	30 DAS (49% AA landings)	2,125	1,328	n/a	797	n/a
	F=0.40 (51% AA landings)	2,120	1,325	n/a	795	n/a
	Basic Run and ETC Flex	**# IFQ Trips**	**0.3125**	**0.3125**	**0.375**	**0**
	30 DAS (49% AA landings)	2,125	664	664	797	n/a
	F=0.40 (51% AA landings)	2,120	663	663	795	n/a
	NLS F=0.44 (52% AA landings)	2,106	658	658	790	n/a

Table 16 – Number of LAGC IFQ Trips by Access Area based on Alternative 3, Section 2.3.2.2.1.3, 5.5% of Access Area Landings

Section 2.3.2.2.1.3 Alt. 3. - 5.5% of AA Landings			MAAA	ETC	NLS	CA II S
Section 2.3.2.2.2.1 Alt. 1 - Equal Distribution of Trips to All Access Areas	**Basic Run**	**# IFQ Trips**	**0.25**	**0**	**0.25**	**0.25**
	30 DAS, F=0.4	2,230	1,115	n/a	558	558
	Basic Run w/ ETC Flex	**# IFQ Trips**	**0.25**	**0.25**	**0.25**	**0.25**
	30 DAS, F=0.4, NLS F=0.44	2,230	558	558	558	558
Section 2.3.2.2.2.2 Alt. 2 - Equal Shares and Distribute CA II trips Evenly Across AA	**Basic Run**	**# IFQ Trips**	**0.66**	**0**	**0.34**	**0**
	30 DAS, F=0.4	2,230	1,472	n/a	758	n/a
	Basic Run and ETC Flex	**# IFQ Trips**	**0.333**	**0.333**	**0.333**	**0**
	30 DAS, F=0.4, NLS F=0.44	2,230	743	743	743	n/a
Section 2.3.2.2.2.3 Alt. 3 - Equal Shares and Distribute CA II trips Evenly Between NLS and MAAA/ETC (50/50)	**Basic Run**	**# IFQ Trips**	**0.625**	**0**	**0.375**	**0**
	30 DAS, F=0.4	2,230	1,394	n/a	836	n/a
	Basic Run and ETC Flex	**# IFQ Trips**	**0.3125**	**0.3125**	**0.375**	**0**
	30 DAS, F=0.4, NLS F=0.44	2,230	697	697	836	n/a

2.4 PRORATION OF ALLOCATIONS TO ACCOUNT FOR 13 MONTH FY IN FY2017

Amendment 19 to the Scallop FMP modifies the start of the scallop fishing year from March 1 to April 1, beginning in FY2018. This change means that the 2017 fishing year will be a month longer (13 months). Alternatives in this section (2.3.2.2) consider whether or not to prorate DAS and LAGC IFQ allocations to account for a longer fishing year. The following options would only apply for FY2017, as the fishery will operate on a 12-month fishing year starting on April 1, 2018.

2.4.1 Alternative 1 – No Action (Based Allocations on 12 month FY)

Under No Action, there would be no change to the allocation for FY2017. The DAS and LAGC IFQ allocations specified through FW28 would be based on a twelve month fishing year, consistent with past approaches. There would be no change to the allocations specified by the Council is Section 2.3, which are based on a twelve month fishing year.

2.4.2 Alternative 2 – Prorate allocations for a 13 month FY by 13/12^{ths}

The 2017 fishing year will be 13 months, and run from March 1, 2017 to March 31, 2018. This alternative would prorate the twelve month DAS and LAGC IFQ specifications in Section 2.3 to account for the longer fishing year. As access area allocations will not be prorated through this option, the prorated LAGC IFQ allocation would be proportional with the increase in landings associated with LA DAS (n prorated LA DAS x 2017 LPUE).

Option 1 would increase the FY2017 allocation based on an additional month being added to the fishing year. The proration would be exclusively based on additional time added within the FY. This option would increase the 2017 DAS and IFQ allocations by roughly 8%.

2.4.3 Alternative 3 – Prorate 2017 allocation based on March fishing activity

Option 2 would prorate the 2017 DAS and LAGC IFQ allocations based on recent DAS usage and LAGC IFQ landings from FY2013 – FY 2015 during the month of March. Both LA and LAGC IFQ components utilized around 4.7% of their DAS and IFQ allocations during March. Therefore, if this option is selected the DAS and corresponding IFQ allocation would be increased by 4.7%.

Table 17 - Recent LA and LAGC IFQ fishing activity during the month of March, FY2013 - FY2015.

FY	% of LA DAS used	# of LA DAS used	% of LAGC IFQ landings	LAGC IFQ landings (lbs)
2015	4.40%	530	4.60%	124,122
2014	4.80%	559	3.40%	75,827
2013	4.80%	593	6.10%	135,561
Average	4.67%	561	4.70%	111,837

Table 18 - Comparison of prorated FY2017 DAS and corresponding IFQ allocations.

	FW 28 Measure	2.3.1.1.1	2.3.1.1.2	2.3.1.1.4	2.3.1.1.3	2.3.2.1.1.1	2.3.2.1.1.2	2.3.2.1.2.1	2.3.2.1.2.2	2.3.2.1.2.3
Option	Description	Basic Run and 30 DAS	Basic Run + ETC Flex at 30 DAS	Status Quo From FY2016 (FW27)	No Action	Basic Run and 30 DAS	Basic Run and DAS set at F=0.4	Basic Run + ETC Flex at 30 DAS	Basic+ETC Flex and DAS set at F=0.4	Basic+ETC Flex+NLS and DAS set at F=0.44
2.4.1	FT LA DAS	30	30	34.55	34.55	30	27.56	30	27.56	29.2
	IFQ Quota (% share)	5.5 mil (10.5%)	5.5 mil (10.5%)	4.4 mil. (9.4%)	4.4 mil. (12.5%)	2.58 mil. (5.5%)	2.47 mil. (5.5%)	2.58 mil. (5.5%)	2.47 mil. (5.5%)	2.43 mil. (5.5%)
2.4.2	13 Month LA DAS (8%)	32.40	32.40	37.31	37.31	32.40	29.76	32.40	29.76	31.51
	13 Month IFQ (8%)	5.64 mil. Lbs	5.64 mil. Lbs	4.58 mil. Lbs	4.58 mil. Lbs	2.69 mil. Lbs	2.57 mil. Lbs	2.69 mil. Lbs	2.57 mil. Lbs	2.53 mil. lbs
2.4.3	13 Month LA DAS (4.7%	31.41	31.41	36.17	36.17	31.41	28.86	31.41	28.86	30.55
	13 Month IFQ (4.7%)	5.6 mil. lbs	5.6 mil. lbs	4.55 mil. lbs	4.55 mil. lbs	2.64 mil. Lbs	2.53 mil. Lbs	2.64 mil. Lbs	2.53 mil. Lbs	2.49 mil. Lbs

2.5 ADDITIONAL MEASURES TO REDUCE FISHERY IMPACTS

2.5.1 Alternative 1 – No Action (Default – RSA compensation fishing restricted to open areas)

RSA compensation fishing would be restricted to open areas only. Vessels with RSA poundage would not be allowed to harvest RSA compensation from access areas.

2.5.2 Alternative 2 – RSA in any area open to the scallop fishery

RSA compensation fishing would be permitted from any area open to the scallop fishery, including open areas and any access areas opened in this action. Vessels with RSA poundage could harvest RSA compensation from any area open to the scallop fishery.

2.5.3 Alternative 3 – RSA compensations fishing only in MAAA and open areas (excluding NGOM Management Area)

RSA compensation fishing would be permitted only in the Mid-Atlantic Access Area and in open areas, excluding the NGOM Management Area. Therefore, RSA compensation fishing would not be permitted in the NGOM, the NLS AA, the CA II S AA, and the ETC AA (if opened). This provision has been used in the past to reduce impacts on small scallops and overall mortality in an area.

Rationale: RSA compensation would be prohibited in several areas. There would be no RSA compensation fishing allowed in the NGOM management area. This provision would be intended to reduce impacts on smaller scallops in the NGOM, and curb overall mortality in the management area. A recent recruitment event within the southern portion of the NGOM management area has led to a substantial increase in biomass estimates since the area was last assessed in 2012.

There would be no RSA compensation fishing allowed in the CA II S access area. This provision would be intended to reduce impacts on Georges Bank yellowtail flounder bycatch in the area. The scallop fishery is allocated 16% of the Georges Bank yellowtail flounder ABC, and the scallop fishery share of the US allocation is expected to be around 30 mt for the coming FY. This measure is intended to compliment other scallop measures intended to reduce the bycatch of Georges Bank yellowtail flounder such a prohibition on the possession of the stock, a seasonal closure from Aug. 15 – Nov. 15, the use of a 10” twine top, and the continuation of a bycatch avoidance program.

There would be no RSA compensation fishing allowed in the NLS access area. This provision would be intended to curb overall mortality in the NLS access area this coming FY. Prohibiting compensation fishing in this area is intended to reduce the potential for higher fishing mortality in the area keep realized F in the area consistent with model estimates.

There would be no RSA compensation fishing allowed in the Elephant Trunk Rotational access area (if opened through this FW). This provision would be intended to reduce impacts on high densities of small scallops in the area. The dominant year class in this area has strong growth potential, and prohibiting RSA compensation fishing is likely to reduce the potential for higher fishing mortality in the area.

2.6 POSSESSION OF SHELL STOCK INSHORE OF DAYS AT SEA MONITORING LINE

2.6.1 Alternative 1 – No Action

There would be no change to existing restrictions on the possession of shell stock inshore of the day-at-sea demarcation line. A vessel with a limited access or general category scallop permit that fishes or transits any are south of 42°20' N latitude during any portion of a trip, it will be prohibited from possessing more than 50 US bushels when inshore of the day-at-sea monitoring line and from landing more than 50 US bushels from a fishing trip. Scallop shell stock must be compliant with the 3½-inch minimum size shell height standards (§648.50). Any vessel fishing in the state waters exemption program (§648.54) would also be exempt from the scallop shell stock limit.

Rationale: This measure is intended to allow a limited fishery to continue north of 42°20 N. latitude by some vessels that have traditionally landed in-shell scallops.

2.6.2 Alternative 2 – Restrict the Possession of Shell Stock Inshore of DAS Demarcation Line

If a vessel with a limited access or general category scallop permit fishes or transits inshore of the day-at-sea monitoring line during any portion of a trip, it will be prohibited from possessing more than 50 US bushels when inshore of the day-at-sea monitoring line and from landing more than 50 US bushels from a fishing trip. Scallop shell stock must be compliant with the 3½-inch minimum size shell height standards (§648.50).

Any vessel fishing in the state waters exemption program (§648.54) would also be exempt from the scallop shell stock limit. NMFS would monitor trips through the VMS program.

Rationale: The FMP relies on day-at-sea restrictions and crew limits to achieve its mortality targets and prevent overfishing. As catch rates rise, it becomes more attractive for vessels to deckload sea scallops and shuck them inside of the day-at-sea monitoring line, thereby circumventing the regulation's intent. Recently, limited access vessels began fishing in areas north of 42°20' N latitude within the NGOM management area, where there is no limit on the number of bushels a vessel may possess inside the demarcation line. This measure would restrict the number of bushels that limited access or general category vessels can possess to 50 when inshore of the day-at-sea monitoring line, effectively expanding an existing provision that only applied to fishing activity south of 42°20' N latitude. This measure will prevent scallop vessels from possessing excessive amounts of shell stock inshore of the day-at-sea monitoring line, eliminating the incentive to deckload and shuck scallops "off the clock". The 50 US bushel limit will enable the vessels to bring a moderate amount of shell stock in to avoid poor weather and/or to land some shell stock for a small market for whole scallops or scallop parts.

3.0 CONSIDERED AND REJECTED ALTERNATIVES

3.1 DAS OPTIONS AT F=0.48

During this specification cycle the Scallop Committee tasked the PDT with several model runs at varying F rates or DAS. In 2016, open areas DAS have been set at an F=0.48, which resulted in 34.55 DAS for the FT LA vessel. In practice, realized overall F rates for the scallop resource are much lower than this value because animals in the open area represent a fraction of the overall biomass.

Rationale for rejection: The Scallop Advisory Panel and Committee recommended moving the F=0.48 run options to considered and rejected to reduce impact on small scallops in open bottom as this option was associated with the highest number of DAS in the framework. Those groups also noted that the F rate associated with open bottom DAS has been set equal to F=0.48 in recent years, and that the open bottom has been pushed hard.

3.2 MANAGEMENT UNCERTAINTY BUFFER FOR THE LAGC IFQ COMPONENT

Measures adopted during and since Amendment 15 have introduced the potential for management uncertainty in the LAGC IFQ fishery. These include mortality from carry-over allowances, and ability of the FMP to monitor and enforce all catch. The PDT evaluated potential sources of management uncertainty, focusing of the annual carryover and potential utilization of carryover pounds in the subsequent fishing year. The PDT noted that carryover is relatively stable year to year in this fishery. The PDT also noted that the IFQ component has not exceeded its sub-ACL since FY2010.

Rationale for rejection: This option was moved to considered and rejected after the Scallop Advisory Panel and Committee indicated support for allocating the LAGC IFQ component spatially, which would result in decrease in quotas for that group. As the LAGC IFQ quota would be roughly 50% of the LAGC sub-ACL when based on projected landings, Committee felt that an additional buffer between projected landings and the ACL was not appropriate at this time.

Table 19 - LAGC IFQ Carryover (lbs) from FY 2010 - FY 2016.

Fishing Year	Sum of carryover	Sum of base allocation	% carryover
2010	0	2,329,500	0%
2011	131,881	3,044,151	4%
2012	194,049	3,273,502	6%
2013	301,354	2,494,866	12%
2014	209,897	2,375,277	9%
2015	243,041	2,939,585	8%
2016	312,796	4,369,333	7%
Total	1,393,018	20,826,214	7%

3.3 SPATIAL MANAGEMENT ALLOCATION CEILING

This measures was originally an element of Section 2.3, Applying Spatial Management to the Specification Setting process. The PDT, AP, and Committee discussed the concept of applying a "ceiling" for the LAGC IFQ could be set at different F rates under a spatial management scenario. In practice, these options would have specified the maximum potential allocation for a given fishing year, which could be equal to or less than the sub-ACL. The actual allocation to both components would be based on projected landings.

Rationale for rejection: This option was moved to considered and rejected because projected landings are already some fraction of the overall ABC and ACL, and the Committee felt that an additional buffer between projected landings and the ACL was not appropriate at this time.

3.4 MODIFICATION TO CLOSED AREA I ACCESS AREA BOUNDARY

The Closed Area I Access Area boundary would have been modified, consistent with recent modifications to groundfish closed areas and habitat closures through the OHA2 (TBD, pending final rule). Alternative 2 would have expanded the boundary of existing Closed Area I access area to include a "sliver" of biomass just to the north of existing northern boundary (Figure 5), while Alternative 3 would have expanded the Closed Area I access area to include the entire Closed Area I Habitat Management Area to the north (Figure 6). Modifications to the Closed Area I Access Area boundary are contingent upon the final rule of Omnibus Habitat Amendment 2.

Rationale for rejection: The Committee's stated intent is to address this issue in the next available Council action. Both the Scallop Advisors and Committee identified expanding the CA I AA to include the entire CA I N HMA as preferred. The Committee voted to move this measure to considered and rejected at its November meeting because it felt that there continues to be uncertainty with when the OHA2 final rule will publish, and there is a possibility that NMFS may not approve the change to the HMA that this measure is predicated upon.

Figure 4 - Current Closed Area I Access Area Configuration

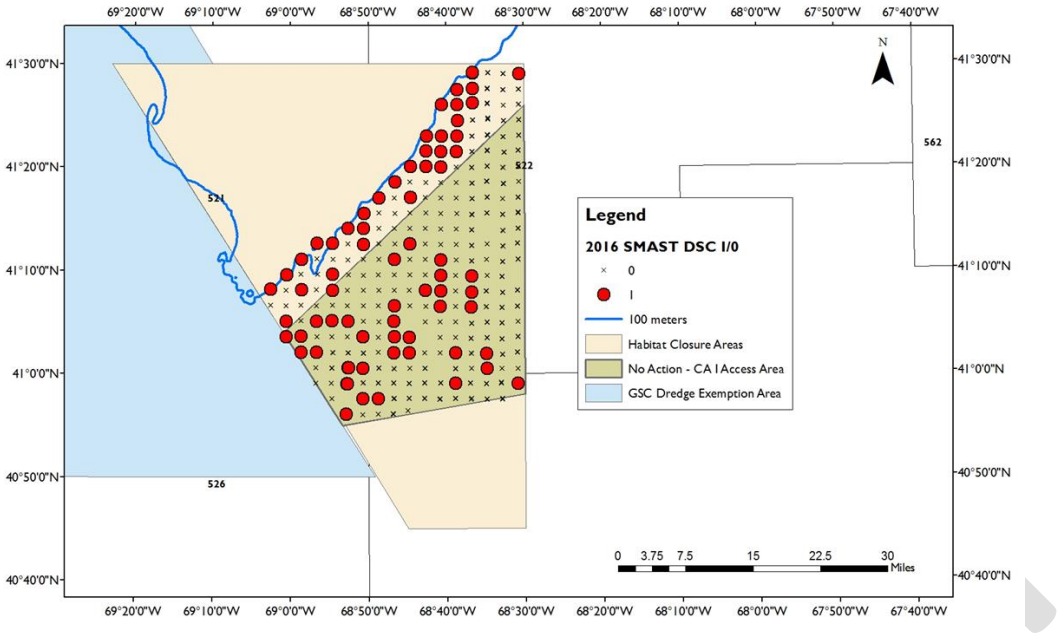


Figure 5 - Configuration of Alternative 2, Expansion of CA I AA (shown in green).

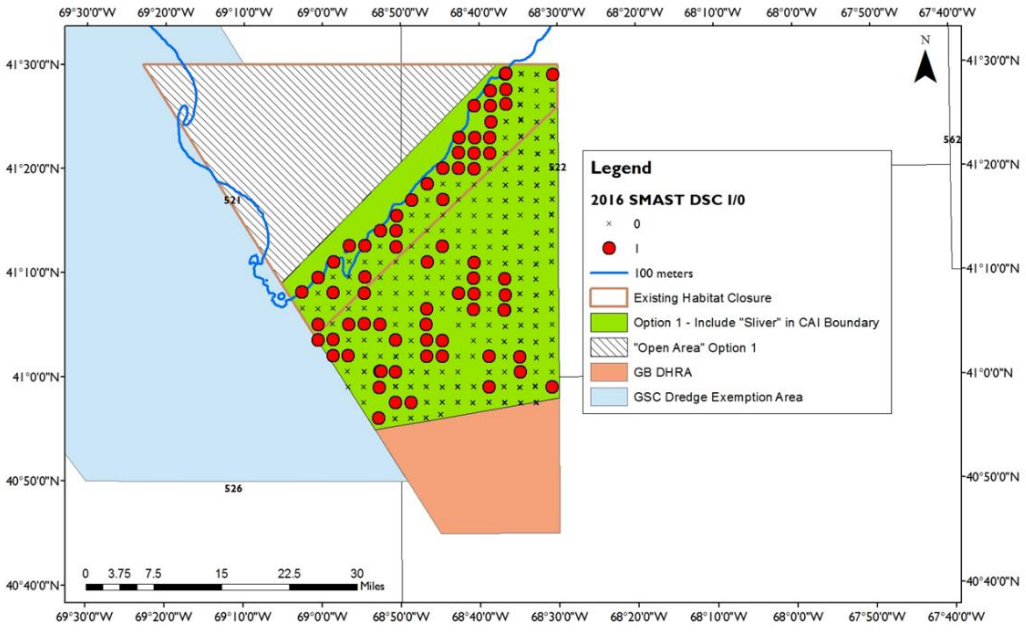
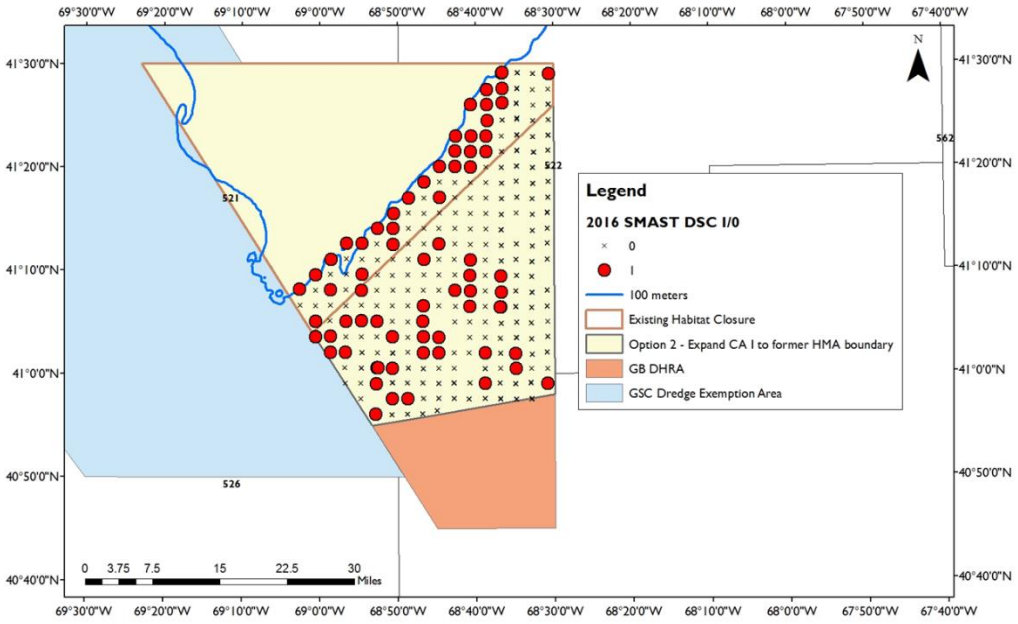


Figure 6 - Configuration of Alternative 3 (formerly Option 2), expansion of the CA I AA.



3.5 CLOSED AREA I ACCESS AREA ALLOCATION

This measure would have allocated the existing CA I carryover pounds in FY2017, contingent upon the approval of the OHA2 amendment. The Committee considered specifying an allocation for access to Closed Area I to facilitate the harvest of LA carryover allocations, contingent upon the final decision of the Omnibus Habitat Amendment II final rule. There are approximately 1.6 million CA I carryover pounds that were allocated through earlier framework actions, but not harvested due to early closure of the area through Emergency Action.

Rationale for rejection: The Committee's stated intent is to address this issue in the next available Council action. The Committee voted to move this measure to considered and rejected at its November meeting because it felt that there continues to be uncertainty with when the OHA2 final rule will publish, and there is a possibility that NMFS may not approve the change to the HMA that this measure is predicated upon.

4.0 AFFECTED ENVIRONMENT

4.1 ATLANTIC SEA SCALLOP RESOURCE

The Atlantic sea scallop (Placopetcen magellanicus) is a bivalve mollusk that is distributed along the continental shelf, typically on sand and gravel bottoms from the Gulf of St. Lawrence to North Carolina (Hart and Chute, 2004). The species generally inhabit waters less than 20o C and depths that range from 30-110 m on Georges Bank, 20-80 m in the Mid-Atlantic, and less than 40 m in the near-shore waters of the Gulf of Maine. Although all sea scallops in the US EEZ are managed as a single stock per Amendment 10, assessments focus on two main parts of the stock and fishery that contain the largest concentrations of sea scallops: Georges Bank and the Mid-Atlantic, which are combined to evaluate the status of the whole stock.

The scallop assessment is a very data rich assessment. The overall biomass and recruitment information are based on results from several surveys including: the NEFSC federal survey; SMAST video survey; VIMS paired tow dredge survey; and towed camera surveys conducted by Arnie's Fishery and Woods Hole Oceanographic Institute. These data sources are combined in the assessment of the resource and in models used by the Scallop PDT to set fishery allocations.

4.1.1 Benchmark Assessment

gThe sea scallop resource just had a benchmark assessment in 2014 (SARC59, 2014). Therefore, all of the data and models used to assess the stock were reviewed. The final results from that assessment have been incorporated into the overall FMP including the updated reference points for status determination (See Section 4.1.1 of Framework 26 for details). The full benchmark assessment and summary report can be found at: http://www.nefsc.noaa.gov/publications/crd/crd1409/ .

Overfishing is occurring if F is above Fsmy, and the stock is considered overfished if biomass is less than ½ Bmsy. The previous estimate of Fmsy was 0.38 and Bmsy was 125K mt (1/2 Bmsy = 62K mt). SARC59 revised these reference points and increased Fmsy to 0.48 and reduced Bmsy to 96,480 mt (½ Bmsy = 48,240 mt). A comparison of the reference points are described in Table 20.

Table 20 – Summary of old and new reference points

	SARC 50 (2010)	SARC 59 (2014)
OFL	F = 0.38	F = 0.48
ABC/ACL (25% chance of exceeding OFL)	F = 0.32	F = 0.38
ACT for LA fishery (25% chance of exceeding ABC)	F = 0.28	F = 0.34
Bmsy (1/2 Bmsy)	125,358 (62,679)	96,480 (48,240)

SARC 59 included a formal stock status update through FY2013, and the reference points were updated in this benchmark assessment. **The updated estimates for 2013 are: F=0.32 and B=132K, so the stock is not overfished and overfishing is not occurring, under both the old and new reference points** (Figure 8 and Table 21). The main driver for the increase in Fmsy is due to increases in natural mortality and weakening of MA stock recruit relationships. In general Fmsy is uncertain because the Fmsy curve for MA is very flat, it is uncertain where Fmax is for that region.

Figure 7 - Whole stock estimate of fishing mortality through 2013 (SARC59) Fishing mortality (red line) and biomass estimates (y^{-1}, gray bars) from the CASA model

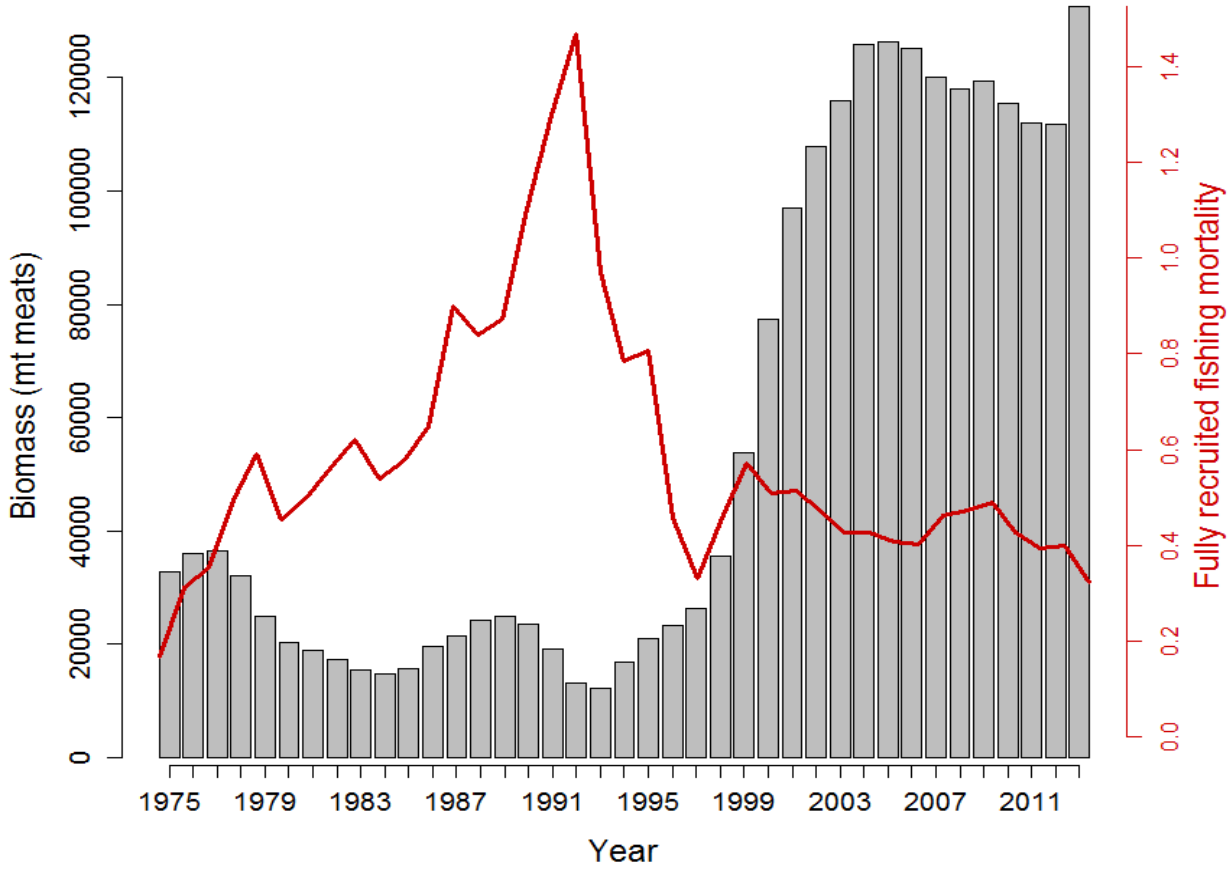


Figure 8 – Fully recruited annual fishing mortality rate for scallops from 1975-2013

Note that trends are different for partially recruited scallops because of changes in commercial size selectivity. SARC59 Fmsy is shown with green dashed line for the most recent period; Fmsy would have been smaller in past years when selectivity was different.

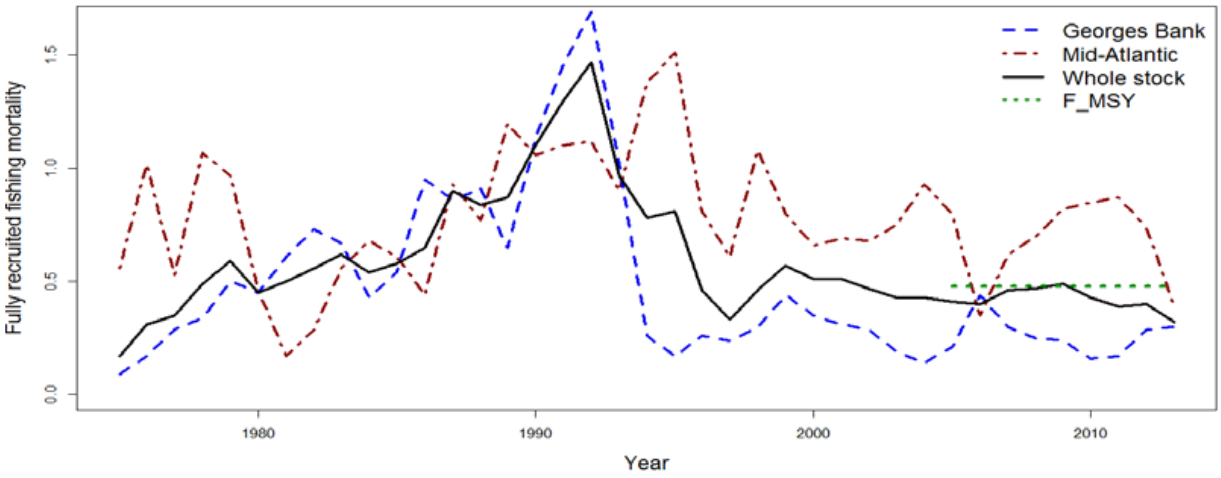
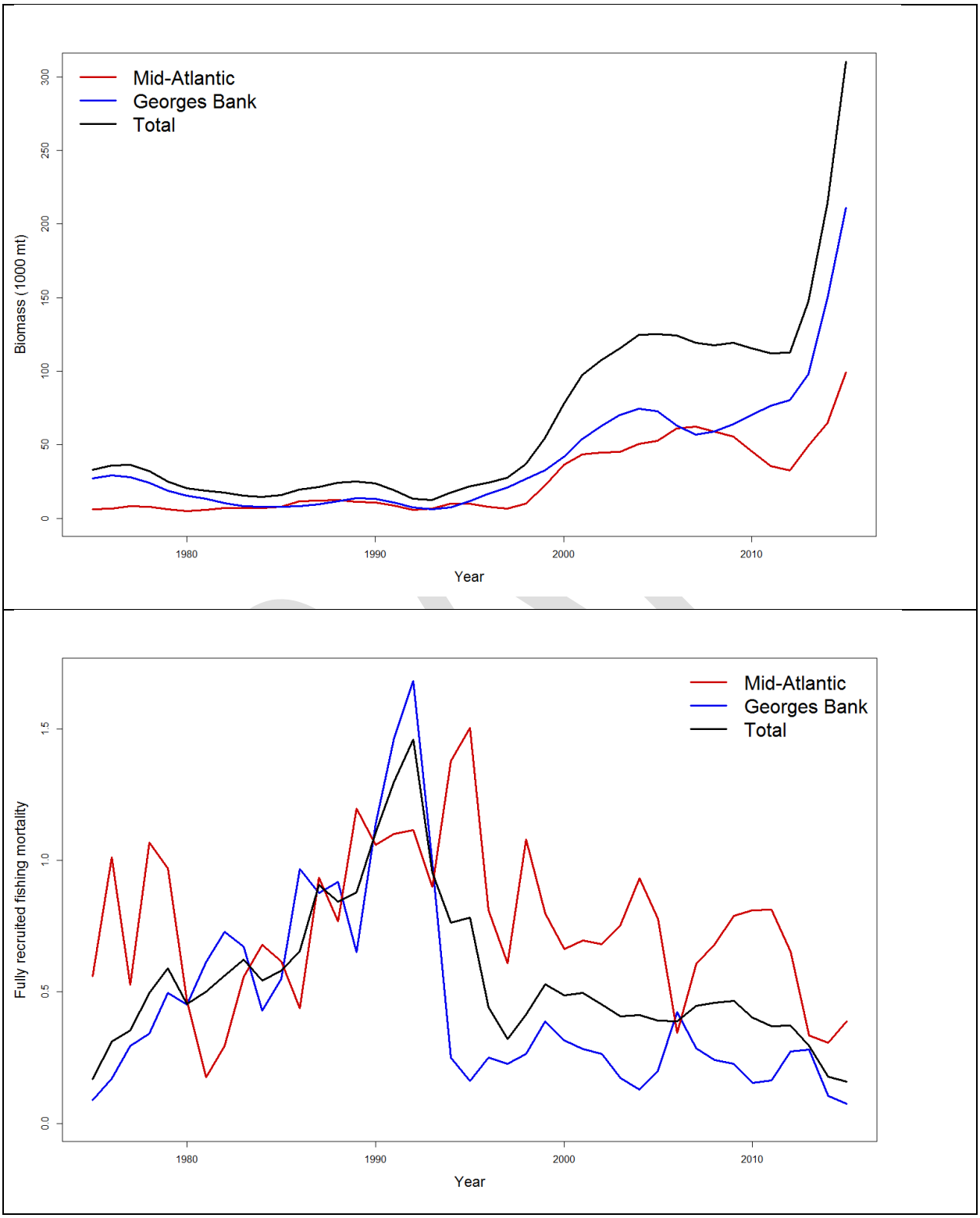


Table 21 – 2013 sea scallop stock status – overfishing is not occurring and the resource is not overfished

	Total 2013 Estimate	Stock Status Reference Points
Biomass (in 1000 mt)	133	½ Bmsy = 48,240
F	0.32	OFL = 0.48

Figure 9 – CASA model estimates of biomass (top) and fishing mortality (bottom) for GB, Mid-Atlantic region, and overall through 2015



The PDT updated the estimate of fishing mortality and biomass for this action adding survey and fishery data through the end of 2015. The total biomass in 2015 estimated from survey data is 310,000 mt, which is above the target, and fishing mortality is estimated at 0.16, which is below the target, but an increase from 2013. **Therefore, the stock is not overfished and overfishing is not occurring**g

4.1.2 FY2017 as a Thirteen Month Fishing Year

The start of the scallop fishing year was modified from March 1 to April 1 through Amendment 19 to the Scallop FMP (approved XXXXXXXXX, 2016). The Council's Science and Statistical Committee (SSC), along with the Scallop PDT discussed the implications of this onetime event during the development of Framework 28. In particular, both the SSC and PDT had focused discussions on how to prorate fishery specifications to account for an additional month in FY2017.

Table 22 - Percent of allocation utilization (LA DAS & IFQ Landings) in March for FY 2013-FY 2015

Percent usage in March		
FY	LA DAS usage	LAGC IFQ landings
2015	4.40%	4.60%
2014	4.80%	3.40%
2013	4.80%	6.10%
Average	4.66%	4.70%

Table 23 - Recent fishing activity (LA DAS usage & IFQ landings) in March for FY 2013-FY 2015

Fishing Activity in March		
FY	LA DAS usage	LAGC IFQ landings
2015	530	124,122
2014	559	75,827
2013	593	135,561
Average	561	111837

Table 24 - Comparison of FY 2017 OFL and specification estimates for a 13 month FY prorated at 13/12th and by recent March fishing activity

	Multiplier	1.08	Multiplier	1.0466
Proration	"13/12ths"		"March DAS"	
OFL	75,485	166,415,938	72,925	160,772,105
ABC/ACL	46,737	103,037,447	45,152	99,543,121
Incidental	23	50,706	23	50,706
RSA	567	1,250,021	567	1,250,021
Observer Set-Aside	467	1,030,374	452	995,431
ACL for fishery	45,680	100,706,346	44,110	97,246,962
LA ACL	43167	95,167,497	41684	91,898,379
LAGC IFQ ACL	2512	5,538,849	2426	5,348,583
LAGC IFQ	2284	5,035,317	2206	4,862,348
LA w/GC IFQ	228	503,532	221	486,235

Table 25 - Original 2017 and 2018 OFL and ABC estimates, including 2016 OFL and ABC values.

Year	MABms	GBBms	TotBms	ExplBms	ABC_Land	ABC_Disc	ABC_Tot	OFL_Land	OFL_Disc	OFL_Tot
2016	93798	141174	234971	52503	37852					68418
2017	124645	183983	308628	106681	43142	13850	56992	52184	17494	69678
2018	127899	182259	310158	157768	50946	13461	64407	61265	17004	78269

4.1.3 Summary of the 2016 surveys

4.1.3.1 Overview of the 2016 surveys

The Atlantic Sea Scallop resource was surveyed by groups/methods: VIMS dredge survey of the Mid-Atlantic, Nantucket Lightship and surrounds, and Closed Area II and surrounds; SMAST large and DSC camera industry-funded detailed survey of Closed Area I Access Area and surrounds, and Nantucket Lightship and surrounds; WHOI HabCam V4 on Northern Edge area of Georges Bank; Habcam Group (Arnie's Fisheries) HabCam v3 survey of the Elephant Trunk; and the federal NEFSC combined survey including dredge tows on GB and Habcam V4 of both the MA and GB regions. Overall, the resource area was well sampled in 2016 and the PDT has access to very extensive survey data for biomass and fishery projections for Framework 28.

4.1.3.2 VIMS dredge survey

The VIMS 2016 survey season included three surveys between mid-May to late June. The VIMS dredge survey continued its use of a random stratified survey to increase precision. It covered the NMFS shellfish strata as well as some additional areas in the Mid-Atlantic Bight (Block Island to Long Island Sound), the NLCA and surrounds, and CA II and surrounds. The 2016 VIMS work includes several secondary project objectives, such as gear performance, scallop biology and product quality, finfish bycatch, scallop predators, and additional sampling requests. Four vessels (3 veteran, 1 new to the survey) were utilized. Approximately 5,000

SH:MW samples were taken during the MAB survey (15 per station). VIMS collected ~1,000 SH/MA samples from the both the NLCA and CA II surveys (again, 15 per station). High spatial and temporal variability in SH:MW relationship in the MAB and CA II is likely a function of depth for each sub-area. For NLCA, significantly different relationships between SAMS regions and zones is likely a function of both depth and scallop density. The PDT discussed that when evaluating SH/MW relationships, animals in different spatial areas my follow different spawning cycles.

The VIMS group highlighted four take home points: 1) biomass in MA closed areas, as well as the NLCA and CA II access areas and surrounds appears to be strong; 2) general lack of strong recruiting year class across all surveyed areas; 3) managers will need to consider how to handle the age 4 scallops in the NLS if expected growth is not realized. This may result in a reduced contribution of yield to the fishery relative to the projections; and 4) continued and expanded presence of a nematode parasite observed in the scallop meats was observed in portions of the MA region.

4.1.3.3 SMAST Drop Camera

The 2016 SMAST scallop survey season included two industry funded projects to conduct intensive surveys (1.5nm grid) of CA I, as well as NLS and surrounds. All surveys included a large camera, small camera, as well as a digital still camera. The surveys completed 549 stations on two separate cruises in June, starting with CA I. A comparison of survey results from 2015 to 2016 for the NLSA indicated that average shell height, total average biomass, and exploitable average biomass all increased. However, abundance of animals appears to have declined in two sub-regions of NL. Shell height frequencies in the NLS from large camera data show the highest frequencies between 50mm and 100mm. The SMAST digital still camera (DSC) results suggest of 92 million lbs of total biomass in NLS-AC-S, about 12% is exploitable (11 million lbs). The DSC also detected a large biomass of scallops in the NLS closed area (72 million lbs, 33 million of which is exploitable). Roughly 30 million lbs of exploitable biomass was initially estimated for NLS access/open areas from 2016 DSC survey.

Scallops appear to be growing slower in the southern portion of the NLS. The PDT discussed slow growth rates at its August meeting, and questioned the assumption that these animals can grow 16-17mm per year at the depth and density they are being observed in the southern portion of the NLS. The PDT recommended that a new SH/MW relationship be developed for the southern portion of the NLS using VIMS survey data. Dr. Hart indicated that the L infinity values in the SAMS model could be reduced to account for this (~20 mm from 155mm).

In terms of the size frequency of observed scallops, the highest frequencies in the CA I large camera data were of animals 100mm and larger. The total estimate of biomass from the DSC in the CA I Access is about 3 million lbs (2 million lbs exploitable). The majority of the exploitable biomass remains in the closed "sliver" area just north of the CA I Access boundary. 2016 DSC results estimate 12 million lbs of biomass in CA I NA, of which 10 million lbs is exploitable. The Council voted to open the CA I NA through OHA2 action, but a final rule is not expected until the spring of 2017.

4.1.3.4 WHOI HabCam Survey

Researchers from the Woods Hole Oceanographic Institute (WHOI) led a survey of the northern edge of Georges Bank, which included the Northeast Reduced Impact Habitat Management

Area, the Northeast Habitat Management Area, and eastern Georges Shoal. The WHOI survey used HabCam v4 on the F/V Jersey Cape in partnership with Lund's Fisheries. Survey data suggests up to five cohorts of scallops within the footprint of the survey. The analysis used 85mm as a cutoff for exploitable biomass. Approximately 53 million lbs of total biomass (small, medium, exploitable) were estimated in the survey area, 46 million of which was considered exploitable at greater than 85mm. The majority of the biomass in the eastern Georges Shoal area was considered to be exploitable, ~14 million lbs. Smaller scallops were observed closer to the Canadian line, with pockets of larger animals observed in deeper areas to the north. The PDT discussed scallop meat quality in this area, with NEFSC staff commenting that meats observed in the federal dredge survey looked healthy.

4.1.3.5 HabCam Group/Arnie's Fisheries HabCam Survey

An intensive survey of the Elephant Trunk was conducted with Arnie's Fishery/HabCam Group using HabCam V3. The survey was conducted using the F/V Kathy Marie on a single cruise from July 9 to July 15. HabCam V3 was towed continuously for more than 700nm. The survey covered ~720 nm (with 2.5nm between transects) in the Elephant Trunk area, collecting 2.68 million images. Approximately 1/200 images was annotated (roughly 10,265). The survey estimated a total biomass of 26,039 mt in the ET open area, and 39,140 mt in the closed area. Highest concentrations of animals were observed in the southern portion of the ET closed area. Some pockets of recruitment were observed (26-50mm shell height) in the area, with the majority of potential recruitment in the 51-75mm range. The mean length frequency in the area was 79mm, which is consistent with data from the VIMS dredge survey.

4.1.3.6 Northeast Fisheries Science Center HabCam and Dredge Surveys

The 2016 federal survey included a dredge survey in portions of GB only (including the GSC) because VIMS covered the MA, CA II and extension, and NLS and extension. Habcam v4 was used in both regions, with results supplemented by the HabCam Group's survey of ET and the WHOI survey of the Northern Edge. Over 100,000 HabCam photos were manually annotated in 2016. The MA leg was conducted in late May and GB in June. Dr. Hart explained that about 1 in 50 images have been processed (one image every 25meters) and preliminary analysis of automated annotations is under way as well.

Survey highlights included high densities of 4 year old scallops in Nantucket Lightship Area and Extension, and 3 year old scallops in HCCA and Elephant Trunk. However, scallops in the southern portion of NLS (deep water) are growing very slowly. Patches of high densities of 6 year old scallops were observed in dredge tows and HabCam v4 of the northern portion of Closed Area I. Decent densities of scallops were seen in the southern portion of CA II AA, but scallops in the CA II extension area still small. She suggested that open area exploitable biomass will be moderate at best. Dr. Hart also noted that large quantities of sea stars and crabs were observed in the shallow portion of the HAPC on the Northern Edge.

Dr. Hart also presented a preliminary exploration of dredge efficiency in high densities of scallops. A comparison of 281 HabCam/dredge pairs from the 2016 survey were examined with at least 50 square meters of Habcam photos within a 0.75 sq nm of dredge tow and with at least minimal scallop densities. Dr. Hart reported that the apparent efficiency of dredge tows in high density areas were all below the expected survey efficiency of 0.4, suggesting that the dredge operates at reduced efficiency when scallop density is very high. The PDT had a lengthy discussion on this issue. Dr. David Rudders explained that VIMS is in the middle of a two year

study comparing 15 minute v. 10 minute tows. The PDT noted that dredge efficiency should be reviewed at the next benchmark assessment.

Figure 10 - 2016 VIMS dredge survey station in the Mid-Atlantic.

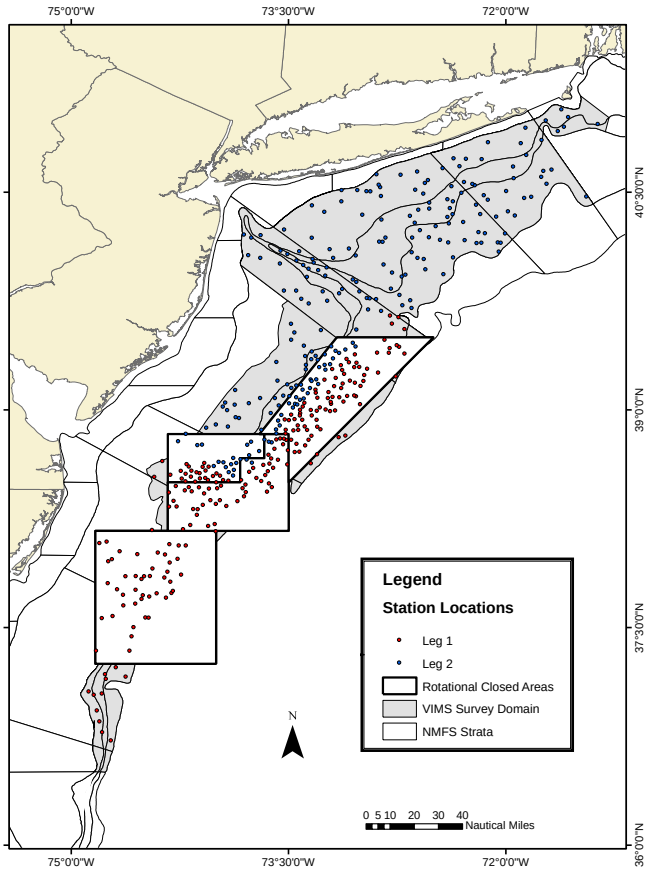


Figure 11 - 2016 dredge surveys of Georges Bank, including VIMS and federal NEFSC dredge survey.

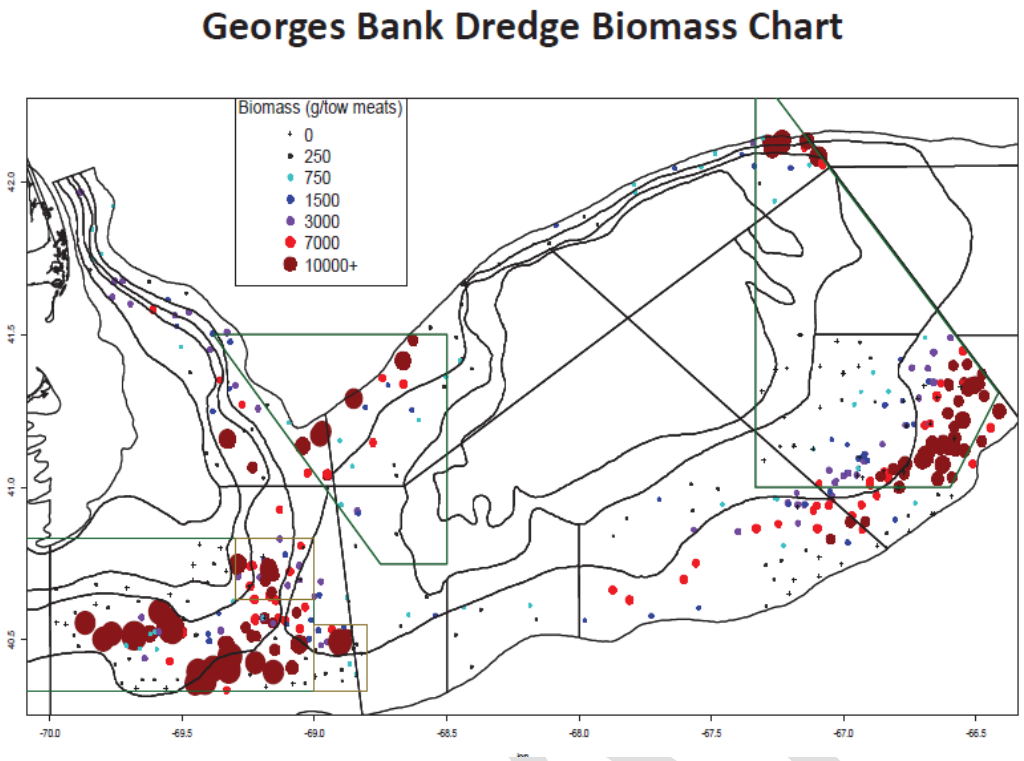


Figure 12 - 2016 SMAST NLS Survey Locations, including Large Camera data.

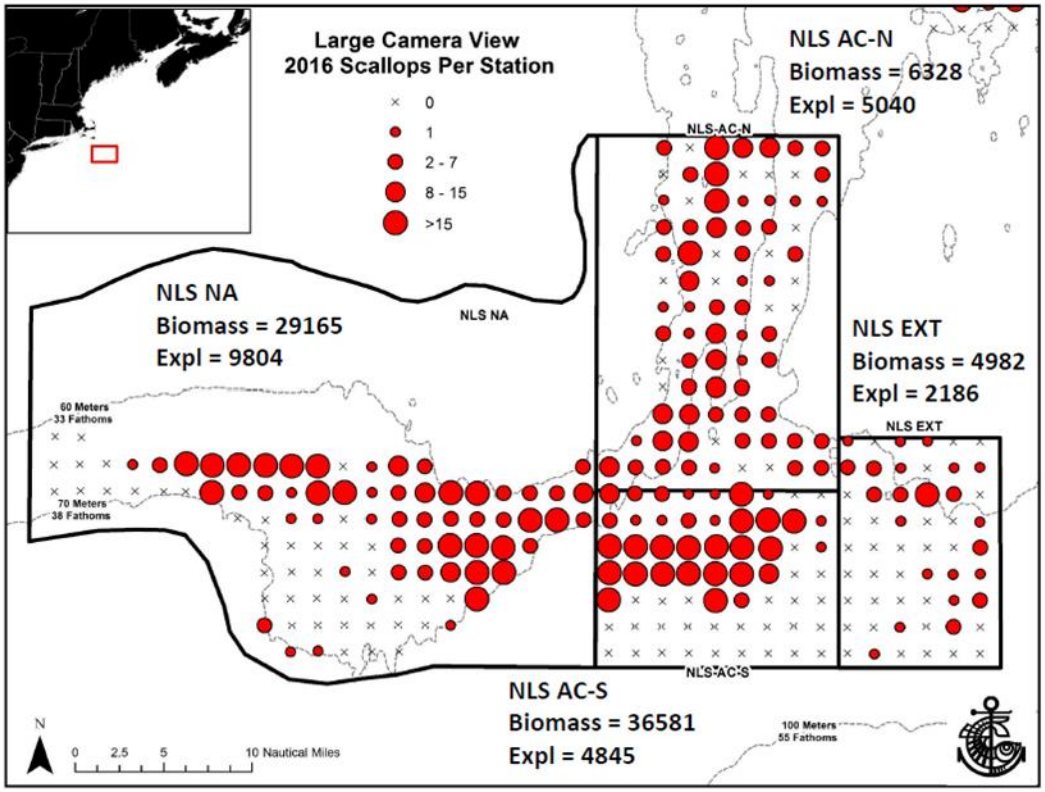


Figure 13 - 2016 SMAST CA I Survey stations, with Large Camera Data.

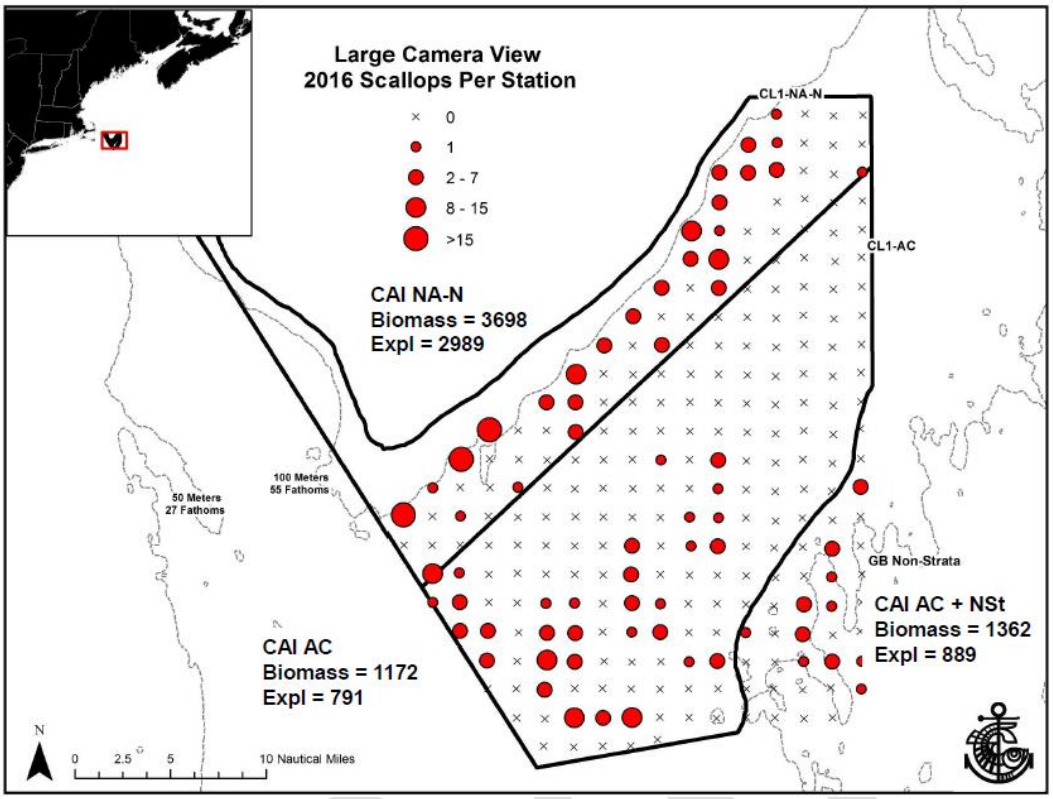


Figure 14 - 2016 combined HabCam coverage, including results from the NEFSC, WHOI, and HabCam group.

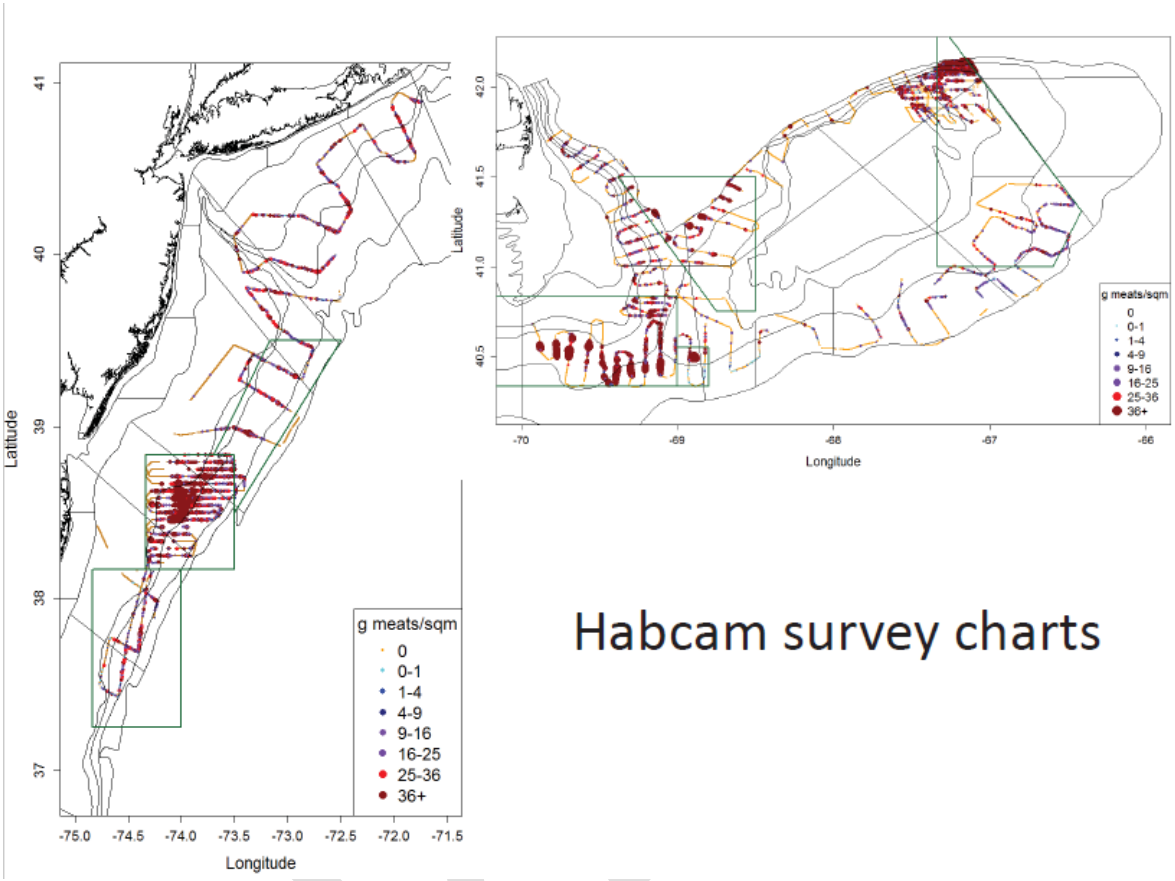


Figure 15 - 2016 WHOI HabCam v4 survey transects of the Northern Edge area.

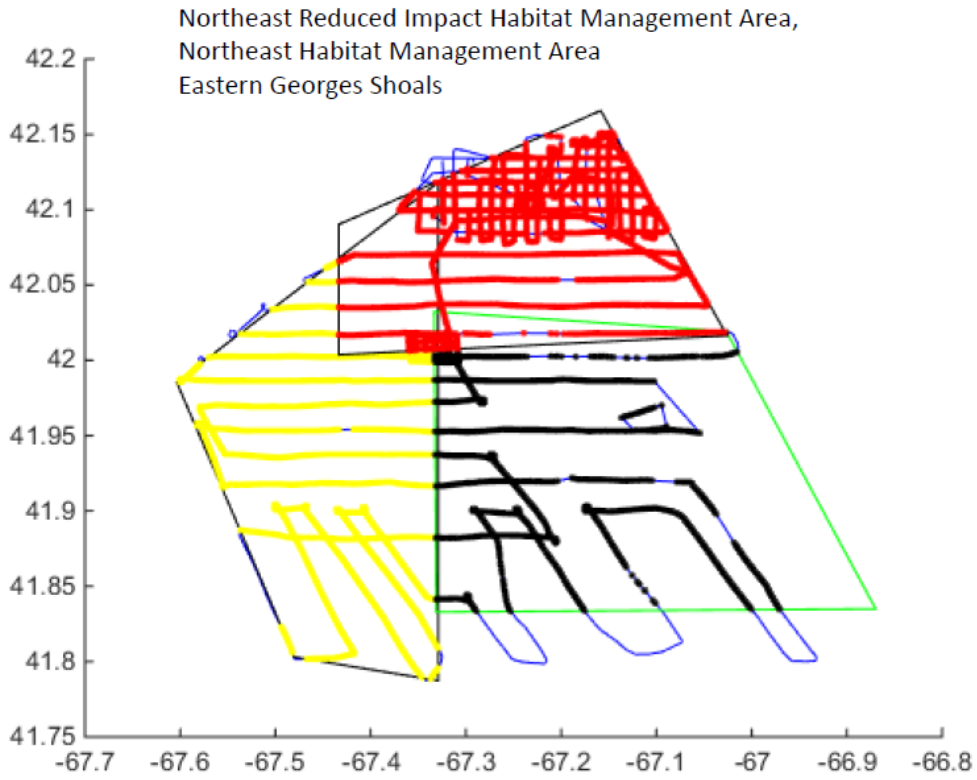


Figure 16 - Length frequency (mm) distributions in Northern Edge area from WHOI HabCam v4 2016 survey.

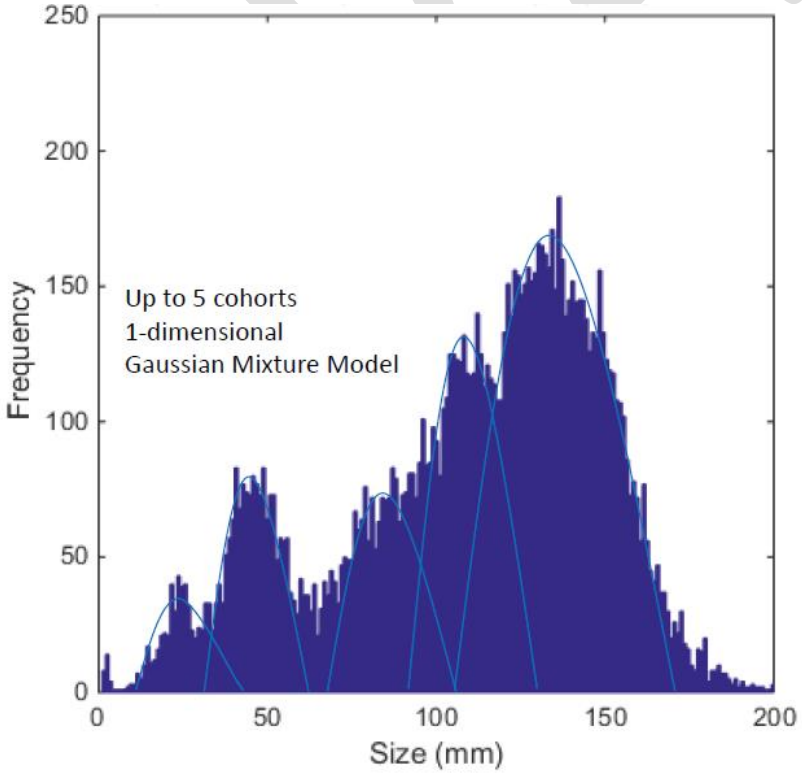


Figure 17 - Transects from HamCam Group's 2016 Elephant Trunk survey.

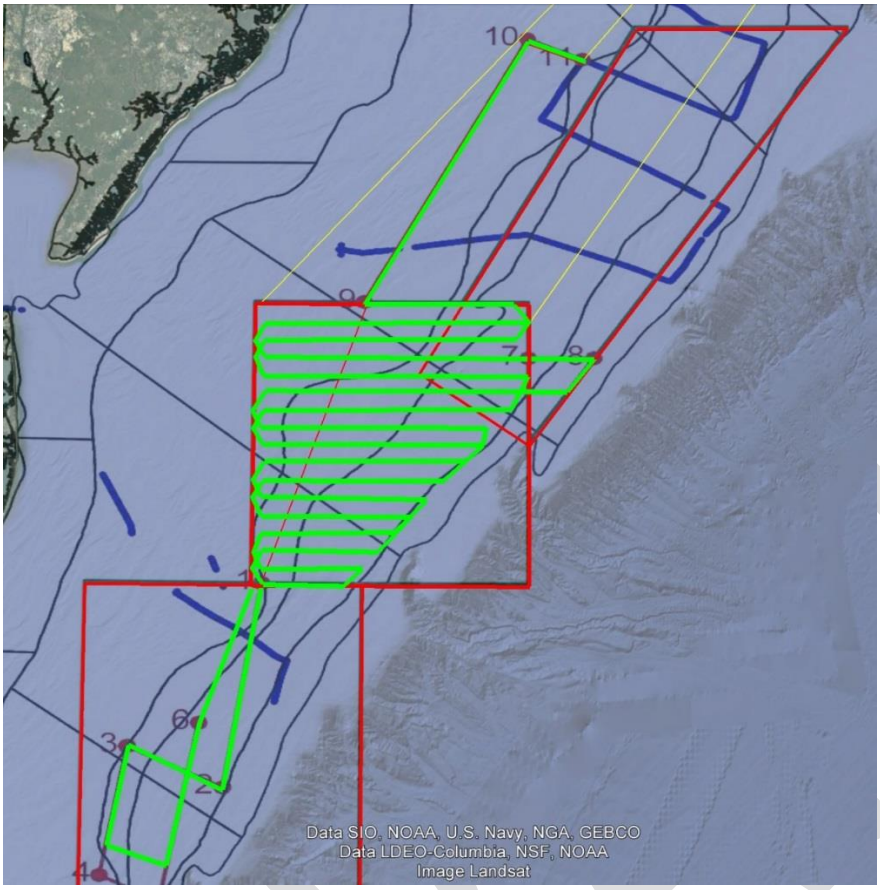


Figure 18 - Plot from HabCam Group's ET survey of observed gram per m2 and predicted mt per km2.

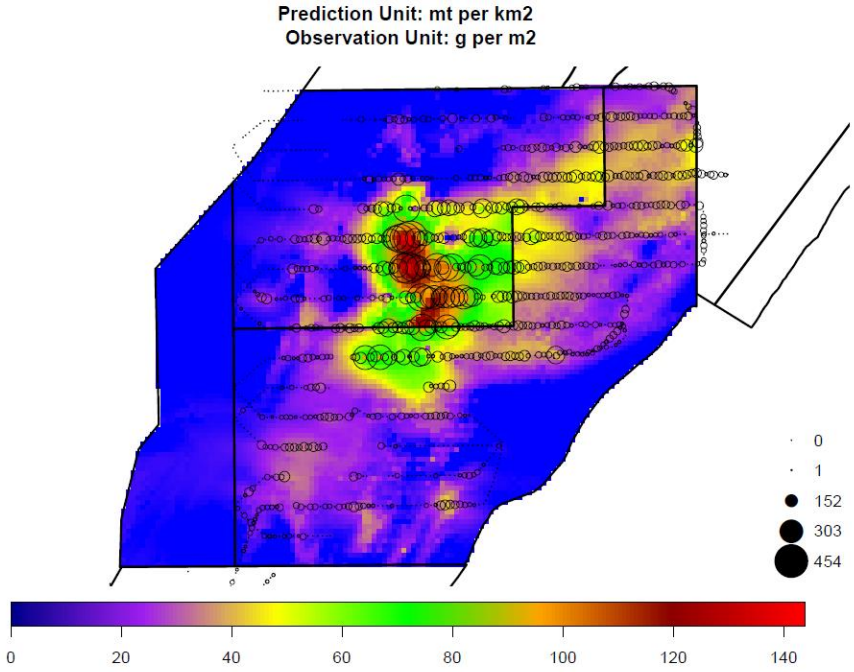


Figure 19 - Length frequency from HabCam Group's 2016 Elephant Trunk survey.

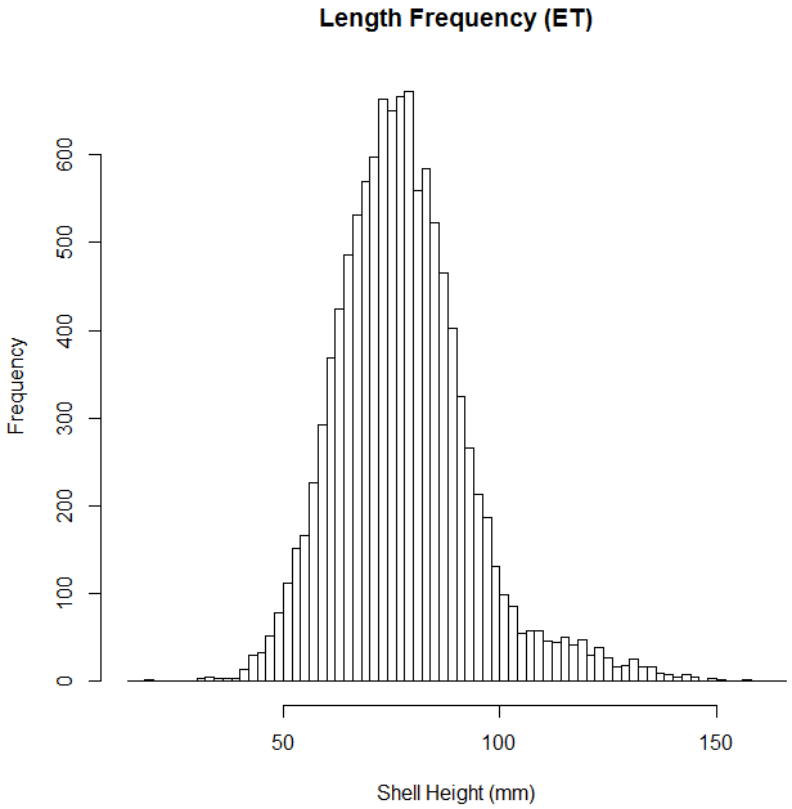


Figure 20 - Length Frequencies from VIMS survey - Mid-Atlantic

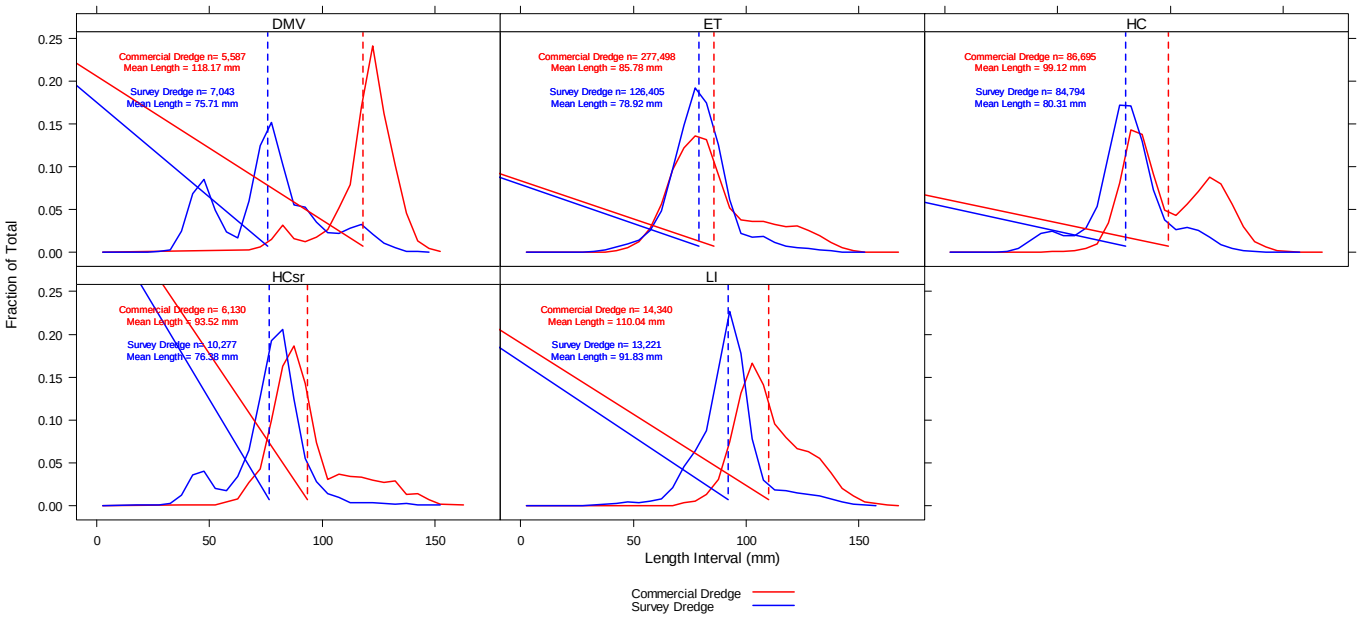


Figure 21 - Length frequencies of CAII S and CA II S Ext from VIMS dredge surveys.

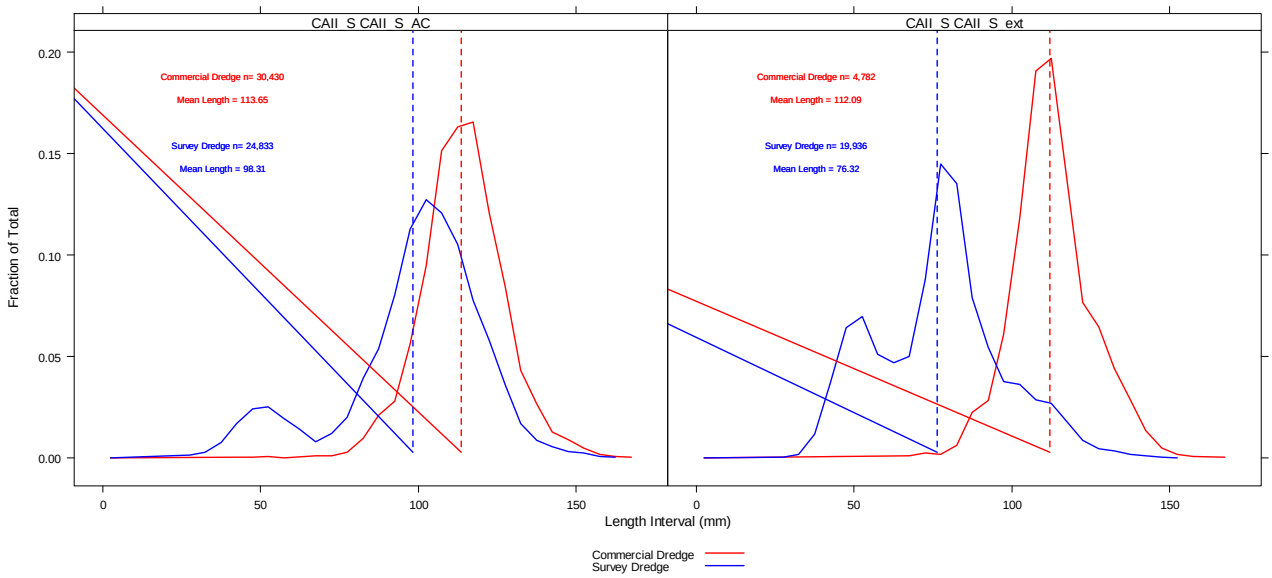
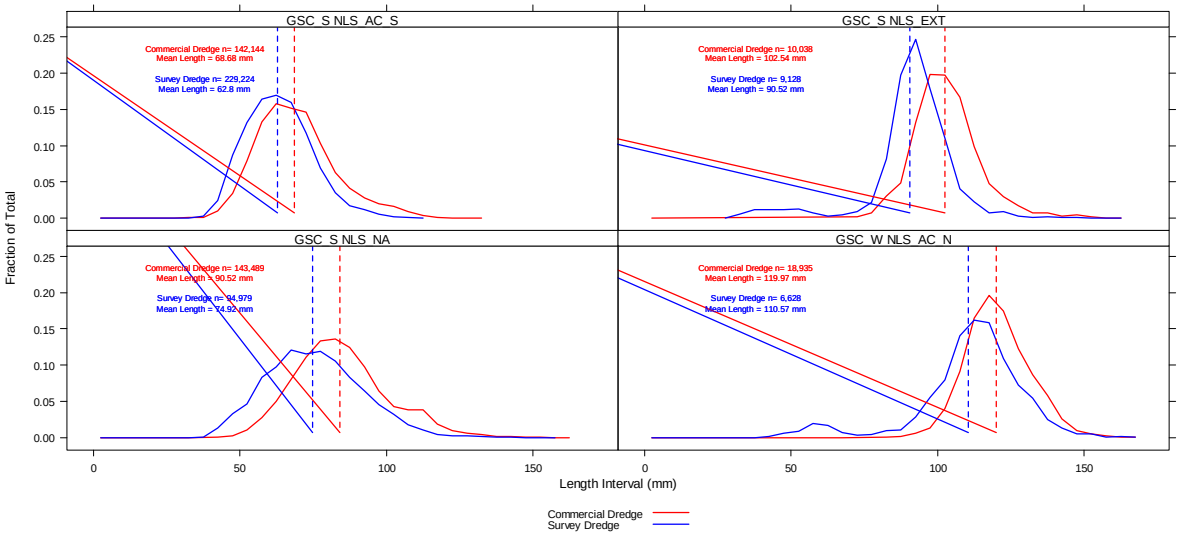


Figure 22 - Length frequencies of NLS areas from VIMS dredge surveys.



4.1.4 Updated estimates of biomass and recruitment

The Scallop PDT combines the results from all available surveys to estimate sea scallop biomass and recruitment on an annual basis. The PDT met on August 30-31, 2016 and reviewed results from all the surveys described above. Survey results were broken down into smaller areas used for management (SAMS areas). Ultimately all survey results are combined per area. Note that corrections and modifications were made in several sub-areas of the Nantucket Lightship in 2016 which resulted in a change in the survey estimates. First, a boundary error was found in the SAMS areas in the NL. Correcting this error expanded the NLS-AC-N and NLS-AC-S areas, and decreased the size of the NLS-NA area west of these areas. This year the NLS-AC-S was expanded north to align with the northern NLS-ext boundary. Three survey groups (VIMS, SMAST, and NEFSC) updated their original survey estimates to reflect these changes. Other

changes in 2016 included the use of the VIMS shell height/meat weight estimates for three of the NL SAMS zones. A review of the HabCam images suggested different growth rates of animals shallower and deeper of 70 meters within the NLS-AC-S. This growth difference in the NLS-AC-S was handled within the SAMS model (i.e. this breakdown is not shown in Table 26).

Table 26 - Summary of 2016 scallop survey estimates.

2016 Scallop Survey Estimates																		
	Dredge				Drop Camera (Digital)				Habcam				Means					
Georges Bank	NumMil	BmsMT	SE	MeanWt	NumMil	BmsMT	SE	MeanWt	NumMill	BmsMT	SE	MeanWt	NumMil	BmsMT	SE	MeanWt	IVWMBms	SE
CL1ACC	82	2250	815	27.3	85	1374	283	16.2	41	1135	11	27.7	70	1586	862	22.8	1136	11
CL1NA	428	11539	4631	27.0	231	5524	1403	23.9	973	16518	1734	17.0	544	11194	5140	20.6	9961	1062
CL-2(N)	209	4391	1288	21.0					260	6887	1092	26.5	234	5639	1689	24.1	5843	833
CL-2(S)	688	13876	866	20.2					500	8632	765	17.3	594	11254	1156	18.9	10932	574
CL2Ext	478	4963	427	10.4					472	3877	154	8.2	475	4420	454	9.3	4002	145
NLSAccN	100	3580	297	35.7	168	6057	1234	35.6	150	6352	613	42.3	139	5330	1410	38.3	4196	261
NLSAccS	5598	27570	2760	4.9	7305	43307	10909	5.9	12559	64982	2453	5.2	8487	45287	11517	5.3	48333	1808
NLSNA	1274	13313	2394	10.5	1768	22499	11959	14.9	5229	76561	3046	14.6	2757	37458	12571	13.6	37107	1860
NLSExt	98	1415	427	14.4	291	4697	4227	16.1	256	6707	506	26.2	215	4273	4279	19.9	3621	325
NF	955	6476	3380	6.8					106	1033	735	9.8	530	3755	3460	7.1	1279	719
SCH	661	9166	3212	13.9					392	3015	214	7.7	526	6090	3219	11.6	3042	214
SF	429	5313	2	12.4					287	3774	146	13.2	358	4544	146	12.7	5313	2
Total Rotational	*7045*	*53655*	*3050*	*7.6*					*13978*	*91686*	*2690*	*6.6*	*9980*	*72150*	*12451*	*7.2*	*75049*	*2017*
Total EFH Closures	*1910*	*29243*	*5370*	*15.3*					*6462*	*99966*	*3671*	*15.5*	*3535*	*54290*	*13686*	*15.4*	*77437*	*3031*
Total Open	*2045*	*20955*	*4663*	*10.2*					*784*	*7823*	*780*	*10.0*	*1415*	*14389*	*4728*	*10.2*	*8180*	*769*
TOTAL	**11001**	**103852**	**8409**	**11.6**					**21224**	**199474**	**4620**	**9.4**	**14930**	**140828**	**19102**	**9.4**	**177301**	**4049**
MidAtlantic																		
Block Island	74	1510	83	20.4									74	1510	83	20.4	1510	83
Long Island	849	14711	735	17.3					1433	21883	10173	15.3	1141	18297	10200	16.0	14749	733
NYB	692	7600	978	11.0					396	6129	4	15.5	544	6865	978	12.6	6129	4
MA inshore	60	726	74	12.2					27	285	1	10.6	43	506	74	11.7	285	1
HCSAA	1171	13824	634	11.8					2046	22311	791	10.9	1609	18068	1013	11.2	17146	495
ET Open	981	11250	450	11.5					2300	26039	1922	11.3	1640	18645	1974	11.4	12018	438
ET Closed	990	10682	821	10.8					4235	39140	4342	9.2	2613	24911	4419	9.5	11665	807
DMV	382	4096	394	10.7					474	6070	1046	12.8	428	5083	1118	11.9	4341	369
Virginia	7	17	3	2.2									7	17	3	2.2	17	3
Total Access	*2534*	*29170*	*1197*	*11.5*					*4819*	*54421*	*4926*	*11.3*	*3677*	*41795*	*5069*	*11.4*	*30579*	*1164*
Total Open	*1682*	*24564*	*1228*	*14.6*					*1856*	*28298*	*10173*	*15.2*	*1810*	*27195*	*10247*	*15.0*	*24618*	*1220*
TOTAL	**5207**	**64416**	**1716**	**12.4**					**10910**	**121859**	**11303**	**11.2**	**8099**	**93901**	**11433**	**11.6**	**65710**	**1696**
OVERALL TOTAL	**16207**	**168268**	**8582**	**10.4**					**32134**	**321333**	**12211**	**10.0**	**23029**	**234729**	**22262**	**10.2**	**218876**	**7021**

4.1.4.1 Georges Bank

The scallop abundance and biomass on Georges Bank increased from 1995-2000 after implementing closures and effort reduction measures. Biomass and abundance then declined from 2006-2008 because of poor recruitment and the reopening of portions of groundfish closed areas. Biomass increased on Georges Bank in both 2009 and 2010, mainly due to increased growth rates and strong recruitment in the Great South Channel, along with continuing concentrations on the Northern Edge and in the central portion of Closed Area I, especially just south of the "sliver" access area

4.1.4.2 Mid-Atlantic

In general, Mid-Atlantic biomass was declining since 2009, and has been steadily increasing as smaller scallops grow. The decline in exploitable biomass from 2006-2014 was primarily from depletion of the large biomass in Elephant Trunk and several years of poor recruitment in that area (2009-2011). However, stronger recruitment has been observed in 2012 and 2013. Once these scallops grow larger biomass in the Mid-Atlantic is expected to increase. The large number of small scallops observed in 2012 in all three MA access areas seems to have survived, and some of these animals were available to the fishery in FY2015. Overall MA scallop biomass is increasing as smaller scallops continue to grow in this area. However, the 2016 surveys suggest no signs of incoming recruitment.

4.1.5 Performance of ACL management

		Allocated		% of Total Allocated	Actual		% Difference (allocated vs actual)	% of Total Actual
		mt	lb		mt	lb		
2011	OFL	32,387	71,401,113					81.88%
	ABC/ACL	27,269	60,117,854					97.24%
	Total Projected Landings	23,723	52,300,000		26,518	58,461,465	112%	
	incidental	23	50,000	0.10%	18	38,700	77%	0.07%
	RSA	567	1,250,000	2.39%	553	1,218,781	98%	2.08%
	OBS	273	601,170	1.15%	104	228,370	38%	0.39%
	IFQ	1,452	3,201,880	6.12%	1,382	3,046,245	95%	5.21%
	LA ACT	21,431	47,247,267	90.34%	24,462	53,929,369	114%	92.25%
	LA ACL	24,954	55,014,153		24,462	53,929,369		
2012	OFL	34,382	75,799,335					75.33%
	ABC/ACL	28,961	63,848,076					89.43%
	Total Projected Landings	25,945	57,200,000		25,900	57,098,684	100%	
	incidental	23	50,000	0.09%	28	61,869	124%	0.11%
	RSA	567	1,250,000	2.19%	529	1,167,316	93%	2.04%
	OBS	290	638,470	1.12%	120	263,700	41%	0.46%
	IFQ	1,544	3,405,000	5.95%	1,511	3,331,284	98%	5.83%
	LA ACT	23,546	51,910,044	90.75%	23,711	52,274,515	101%	91.55%
	LA ACL	26,537	58,503,960					
2013	OFL	31,555	69,566,867					57.22%
	ABC/ACL	21,004	46,305,894					85.97%
	Total Projected Landings	17,335	38,216,741		18,056	39,807,589	104%	
	incidental	23	50,000	0.13%	21	47,337	95%	0.12%
	RSA	567	1,250,000	3.27%	553	1,218,204	97%	3.06%
	OBS	210	463,059	1.21%	174	384,545	83%	0.97%
	IFQ	1,111	2,449,856	6.41%	1,095	2,414,256	99%	6.06%
	LA ACT	15,324	33,783,637	88.40%	16,213	35,743,247	106%	89.79%
	LA ACL	19,093	42,092,979		16,213	35,743,247		
2014	OFL	30,419	67,062,415		0			47.75%
	ABC/ACL	20,782	45,816,467		0			69.89%
	Total Projected Landings	17,327	38,463,656		14,524	32,020,980	83%	
	incidental	23	50,000	0.13%	19	42,107	84%	0.13%
	RSA	567	1,250,000	3.27%	433	954,011	76%	2.98%
	OBS	208	458,562	1.20%	177	390,579	85%	1.22%
	IFQ	1,099	2,423,145	6.34%	948	2,089,589	86%	6.53%
	LA ACT	15,567	34,319,360	89.84%	12,948	28,544,694	83%	89.14%
	LA ACL	18,885	41,634,305		12,948	28,544,694		
2015	OFL	38,061	83,910,142			37,206,977		
	ABC/ACL	25,352	55,891,593			36,974,195		
	Total Projected Landings	21,500	47,400,000					
	incidental	23	50,000	0.11%		29,395		
	RSA	567	1,250,021	2.64%		1,223,918		
	OBS	254	559,974	1.18%	196	432,679	77%	
	IFQ	1,348	2,971,831	6.27%	1,161	2,559,595	86%	
	LA ACT	19,331	42,617,560	89.91%	14,317	31,564,479	74%	
	LA ACL	23,161	51,061,265					
2016	OFL	68,418	150,835,870					
	ABC/ACL	37,852	83,449,375					
	Total Projected Landings	21,288	46,932,006					
	incidental	23	50,000	0.11%				
	RSA	567	1,250,000	2.66%				
	OBS	379	835,552	1.78%				
	IFQ	2,029	4,473,180	9.53%				
	LA ACT	18,290	40,322,555	85.92%				
	LA ACL	34,855	76,842,135					

4.1.6 Northern Gulf of Maine

The scallop resource in the GOM varies widely with sporadic booms and busts. The qualification period adopted under Amendment 11 for the general category IFQ fishery did not overlap with a period of high scallop abundance in the GOM (FY2000-2004). Therefore, a separate limited entry program was adopted in Amendment 11 with a longer qualification period and no landings history requirement, but more conservative fishing measures including lower possession limits and more restrictive gear requirements. The LAGC Northern Gulf of Maine (NGOM) permit was established and about 125 permits were issued in 2010.

4.1.6.1 Summary of 2016 NGOM Survey

The 2016 NGOM survey was conducted in May and June of 2016 over 238 stations in 7 areas throughout the Gulf of Maine (Cape Ann to Machias Seal Island) by Maine DMR/UMaine. The gear remained the same from past surveys with a 7' dredge that was a New Bedford-style chain sweep with 2 inch rings, unlined, with rock chains. Tow lengths were 5 generally minutes and tow speed was around 3.5 kts.

Seven strata were sampled in the NGOM survey from off Machias in Downeast Maine to Northern Stellwagen Bank off Massachusetts. The southern three strata (Ipswich Bay, Southern Jeffries Ledge, & Northern Stellwagen Bank) were further divided into high, medium, and low density substratum based on past survey data, VTR, and VMS data. Abundance indices from the survey within each strata were converted to biomass through the development of shell height-meat weight relationships. Shell height-meat weight relationships were modeled separately for each strata using log-log regression. Biomass per tow was converted to biomass per square meter by dividing total biomass in a given tow by the area swept by that tow. Within each strata (and substratum) biomass per square meter underwent bootstrapping 10,000 times. An overall mean of the 10,000 runs was produced, as well as percentiles around the mean to help describe the uncertainty of the estimates (i.e. 10^{th} percentile, 25% percentile, etc). Biomass estimates and TAC options were then calculated by multiplying the total area within the stratum (or individual substratum) by the percentile of interest produced by the bootstrapping procedure. Tow efficiency (estimated at 0.4) was also taken into account at this stage.

The majority of the harvestable biomass in the NGOM management area is currently off of Cape Ann. Smaller concentrations of biomass (>101mm) were seen in Machias/Seal Island, and on Platts Bank. The survey also covered bottom outside of the NGOM management area on Fippinies Ledge. Biomass estimates were substantially higher in 2016 than they were in 2012. Biomass estimates were presented to the PDT using an F=0.38 and an F=0.26. The PDT requested a new model run using an F=0.2, with estimates at the q.25 and q.10. The PDT noted that the NGOM is a relatively "data poor" situation when compared to the annual surveys of Georges Bank and the Mid-Atlantic, and viewed the biomass estimates coming out of the F=0.2 runs as upper bounds of removals.

Table 27 - Biomass estimates from 2016 NGOM survey (F=0.2, Dredge Efficiency=0.4).

Exploitation Rate = 0.20 Dredge Efficiency = 0.40	q0.05	q0.10	q0.15	q0.20	q0.25	Mean
Biomass Estimate (MT)	657	795	932	1018	1090	1651
TAC(MT)	131	159	186	204	218	330
Biomass Estimate (lbs)	1,447,797	1,751,822	2,055,240	2,244,263	2,402,140	3,640,385
TAC(lbs)	289,559	350,364	411,048	448,853	480,428	728,077

Figure 23 - 2016 ME DMR NGOM Survey Areas.

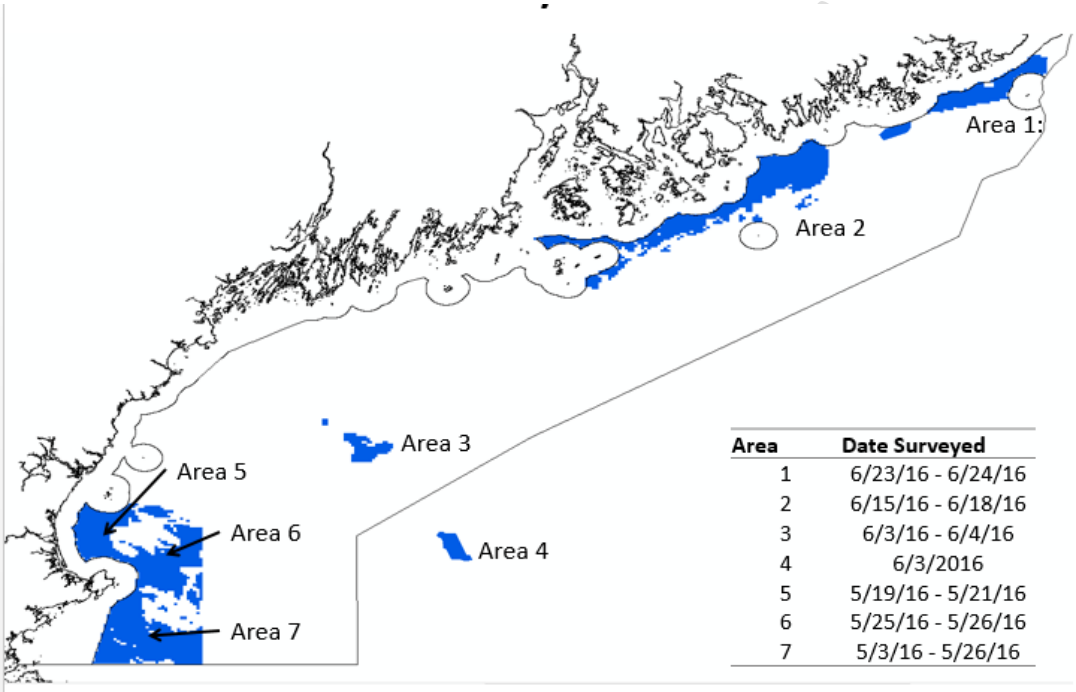
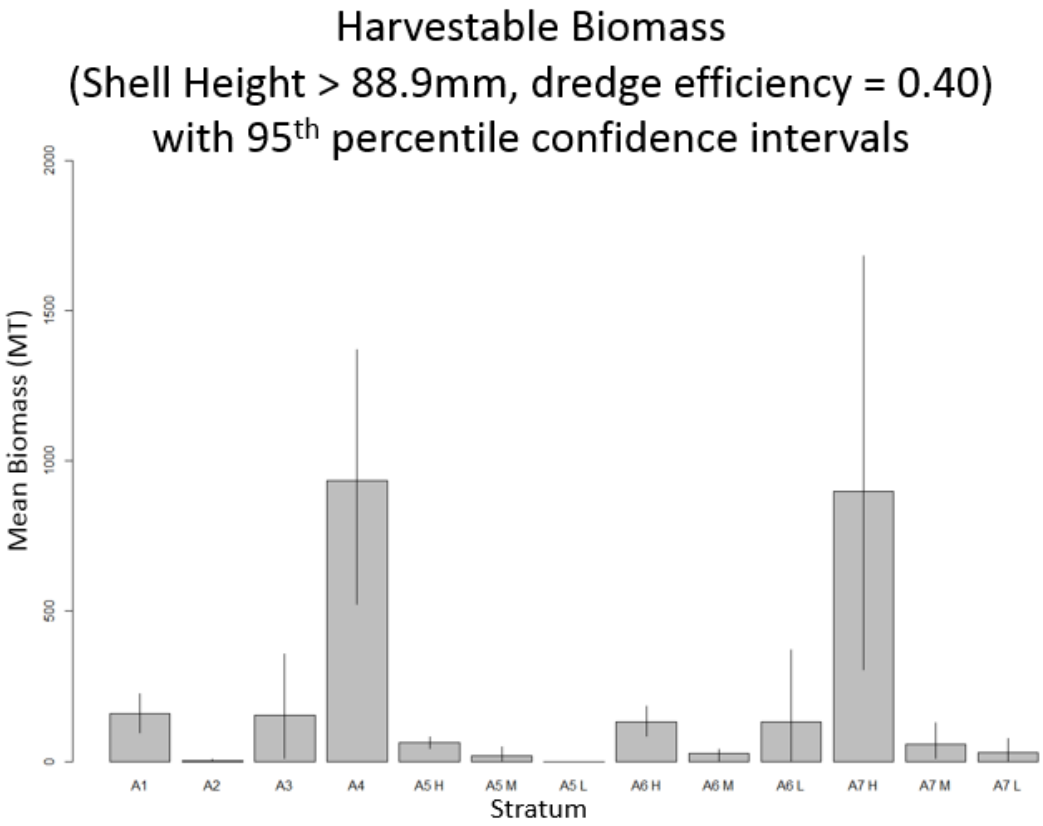


Figure 24 - 2016 ME DMR NGOM survey - estimates of harvestable biomass from each survey area.



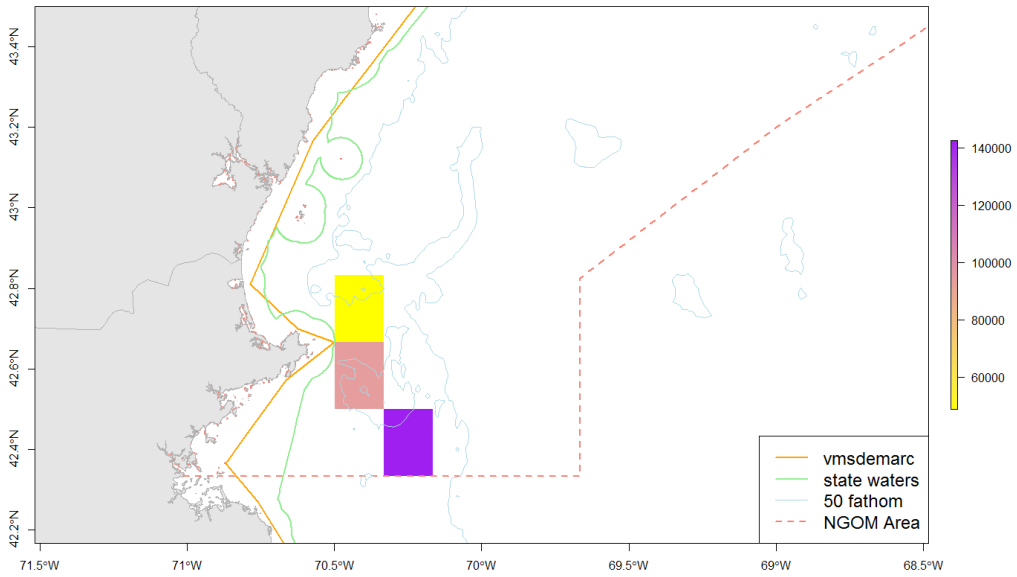
4.1.6.2 Summary of NGOM Fishery Data

Total landings by all fishery components from the NGOM management area have increased over time, reaching a high of over 375,000lbs in FY2016 (Table 28). From 2009 – 2015, all landings attributed to the management area came from LAGC IFQ and LAGC NGOM fishing. In FY 2016, LA vessels are estimated to have harvested close to 300,000 lbs from the NGOM Management Area (working in areas east and southeast of Cape Ann). The FY 2016 estimate assigns LA landings to NGOM based VTR point locations. LA vessels operating under DAS may fish inside and outside of NGOM management area within the same statistical reporting area (ex: SRA 514) on the same trip (or haul). The NGOM area closed to all scallop fishing on May 13, 2016.

Table 28 – Total landing attributed to the NGOM Management Area by permit type, FY 2009 - FY 2016

	Landings by Permit Category			Total NGOM Landings	NGOM closure date, (days open)
FY	**LAGC IFQ**	**LAGC NGOM**	**LA**		
2009	0	5793	0	5793	n/a, (entire FY year)
2010	4762	3877	0	8639	n/a, (entire FY year)
2011	6092	816	0	6908	n/a, (entire FY year)
2012	894	6546	0	7440	n/a, (entire FY year)
2013	8907	46501	0	55408	n/a, (entire FY year)
2014	13286	48900	0	62186	n/a, (entire FY year)
2015	26894	46879	0	73773	n/a, (entire FY year)
2016	24840	62263	291232*	378335	May 13, (74 days)
*Most recent estimate using VTR point locations.					

Figure 25 - FY 2016 Limited Access landings based on VTR fishing locations in the NGOM management area.



Both LAGC NGOM and LAGC IFQ vessels have fished in the NGOM. The majority of annual landings from the area have come from NGOM permit holders since FY 2012 (Table 29). LAGC IFQ activity has almost exclusively been in southern area (north of Cape Ann and along southern boundary). NGOM effort focused on Platt's Bank effort in 2013 and 2014. The average landings per trip for NGOM and IFQ vessels have been similar each FY, with average landings increasing by over 50lbs from FY 2015 to FY 2016. More LAGC NGOM permits are fishing in the area compared to IFQ vessels. The number of permits with associated landings increased for both IFQ and NGOM in FY 2016, to a total of 37 LAGC IFQ and NGOM. (Table 30). Since the start of the NGOM management program, seven LAGC IFQ permits have converted to NGOM

permits (Table 31). LAGC landings exceeded the 70,000 lb hard-TAC for the area in FY2015, triggering a pound for pound payback in FY 2016. The NGOM TAC was exceeded for the second consecutive year in FY 2016 (Table 32).

Table 29 - NGOM Landings by LAGC IFQ and LAGC NGOM permits, FY 2011 - FY 2016.

	Landings in lbs (% Total Landings)	
FY	LAGC IFQ	LAGC NGOM
2011	6092 (88%)	816 (12%)
2012	894 (12%)	6546 (88%)
2013	8907 (16%)	46501 (84%)
2014	13286 (21%)	48900 (79%)
2015	26894 (36%)	46879 (64%)
2016	24840 (29%)	62263 (71%)

Table 30 - Average Landings and number of active permits by LAGC permit type, FY 2011 - FY 2016.

	Average Landings (lbs)		Number of Permits	
FY	LAGC IFQ	LAGC NGOM	LAGC IFQ	LAGC NGOM
2011	76	51	6	4
2012	128	115	3	6
2013	87	122	7	11
2014	83	110	8	17
2015	99	104	8	20
2016	154	162	12	25

Table 31 - Number of LAGC IFQ permits converted to LAGC NGOM permits by year.

Fishing Years	**Number of Permits Converted**
2010 - 2015	7

Data are from the moratorium and vessel permit databases.

Table 32 - Total estimated LAGC landings from NGOM management area.

FY	Total LAGC IFQ & NGOM Landings
2011	6908
2012	7440
2013	55408

2014	62186
2015	73773
2016	87103

4.2 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Ecosystem includes the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream to a depth of 2,000 m (Figure 20, Sherman et al. 1996). Four distinct sub-regions are identified: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The physical oceanography and biota of these regions were described in the Scallop Amendment 11. Much of this information was extracted from Stevenson et al. (2004), and the reader is referred to this document and sources referenced therein for additional information. Primarily relevant to the scallop fishery are Georges Bank and the Mid-Atlantic Bight, although some fishing also occurs in the Gulf of Maine. The link with more information about the EFH description for Atlantic sea scallop can be found at: http://www.nero.noaa.gov/hcd/scallops.pdf.

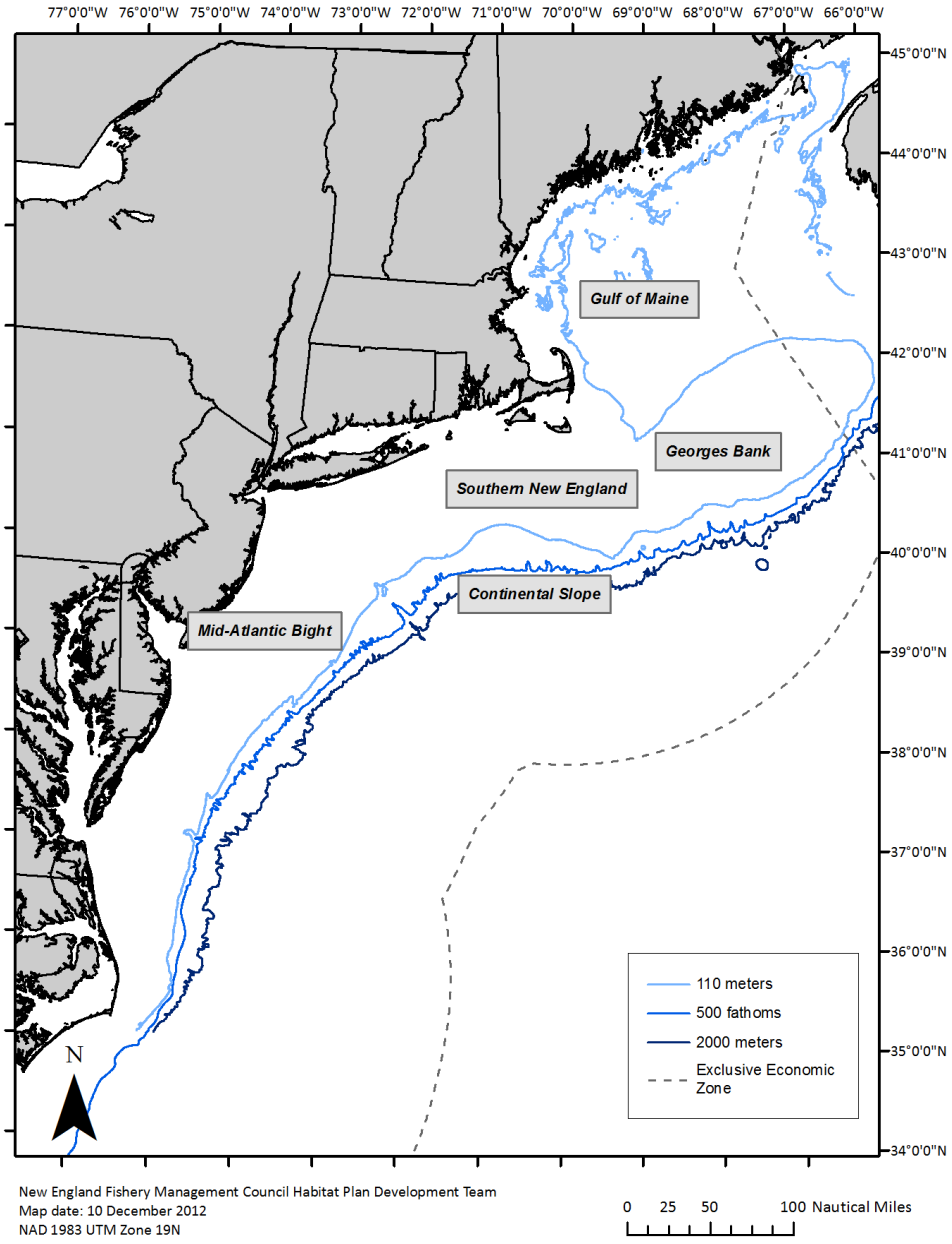
The Atlantic sea scallop fishery is prosecuted in concentrated areas in and around Georges Bank and off the Mid-Atlantic coast, in waters extending from the near-coast out to the edge of the continental shelf. Atlantic sea scallops occur primarily in depths less than 110 meters on sand, gravel, shells, and cobble substrates (Hart et al. 2004). This area, which could potentially be affected by the preferred alternative, has been identified as EFH for various species. These species include American plaice, Atlantic cod, Atlantic halibut, Atlantic herring, Atlantic sea scallop, Atlantic surfclam, Atlantic wolfish, barndoor skate, black sea bass, clearnose skate, haddock, little skate, longfin squid, monkfish, ocean pout, ocean quahog, pollock, red hake, redfish, rosette skate, scup, silver hake, smooth skate, summer flounder, thorny skate, tilefish, white hake, windowpane flounder, winter flounder, witch flounder and yellowtail flounder. For more information on the geographic area, depth, and EFH description for each applicable life stage of these species, the reader is referred to Table 45 of the scallop Amendment 15 EIS.

Most of the current EFH designations were developed in NEFMC Essential Fish Habitat Omnibus Amendment 1 (1998). Most recently, Amendment 16 to the Northeast Multispecies FMP adds Atlantic wolfish to the management unit and includes an EFH designation for the species. For additional information, the reader is referred to the Omnibus Amendment and the other FMP documents listed in Table 28 of the scallop Amendment 15 EIS. In addition, summaries of EFH descriptions and maps for Northeast region species can be accessed at http://www.nero.noaa.gov/hcd/list.htm.

Designations for all species are being reviewed and updated in NEFMC Omnibus Essential Fish Habitat Amendment 2 (OA2). Another purpose of OA2 is to evaluate existing habitat management areas and develop new habitat management areas. To assist with this effort, the Habitat PDT developed an analytical approach to characterize and map habitats and to assess the extent to which different habitat types are vulnerable to different types of fishing activities. This body of work, termed the Swept Area Seabed Impact approach, includes a quantitative, spatially-referenced model that overlays fishing activities on habitat through time to estimate both potential and realized adverse effects to EFH. The approach is detailed in this document, available on the Council webpage:

http://www.nefmc.org/habitat/planamen/efh_amend_2/appendices%20-%20dec2013/Appendix%20D%20-%20Swept%20Srea%20Seabed%20Impact%20approach.pdf.

Figure 26 - Northeast U.S. Shelf Ecosystem and geographic extent of the US sea scallop fishery



The Council identified final recommendations for modifications to habitat management areas over two Council meetings, April 2015 and June 2015. That action is currently under review and is expected to be implemented in 2016. A summary of the Council's preferred recommendations can be found at www.nefmc.org, and Figure 27 and Figure 28 are included below with the final recommendations for habitat management areas and seasonal spawning areas. **Note that these measures have not been approved; a proposed rule is expected in early 2016.**

Figure 27 – Preferred alternative year-round spatial management areas. Seasonal areas not shown.

-- Gear exemption areas hatched. In western Gulf of Maine, shrimp trawls exempt. In Great South Channel and Georges Shoal, clam dredges exempt for one year. On Northern Edge (red area), scallop access fishing exempt, bottom trawling for groundfish exempt west of 67° 20′ W.
-- Dedicated Habitat Research Areas are cross-hatched. Stellwagen DHRA (north), Georges Bank DHRA (south)
-- Mortality closures shown with heavy black outline. Current gear restrictions.
-- Largest shaded area is the roller gear restricted area.
-- Other shaded/colored areas are mobile bottom-tending gear closures, with gear exemptions as noted above.
-- Cox Ledge closed to clam dredges, and trawls cannot use ground cables.
-- Ammen Rock closed to all gears except lobster traps.

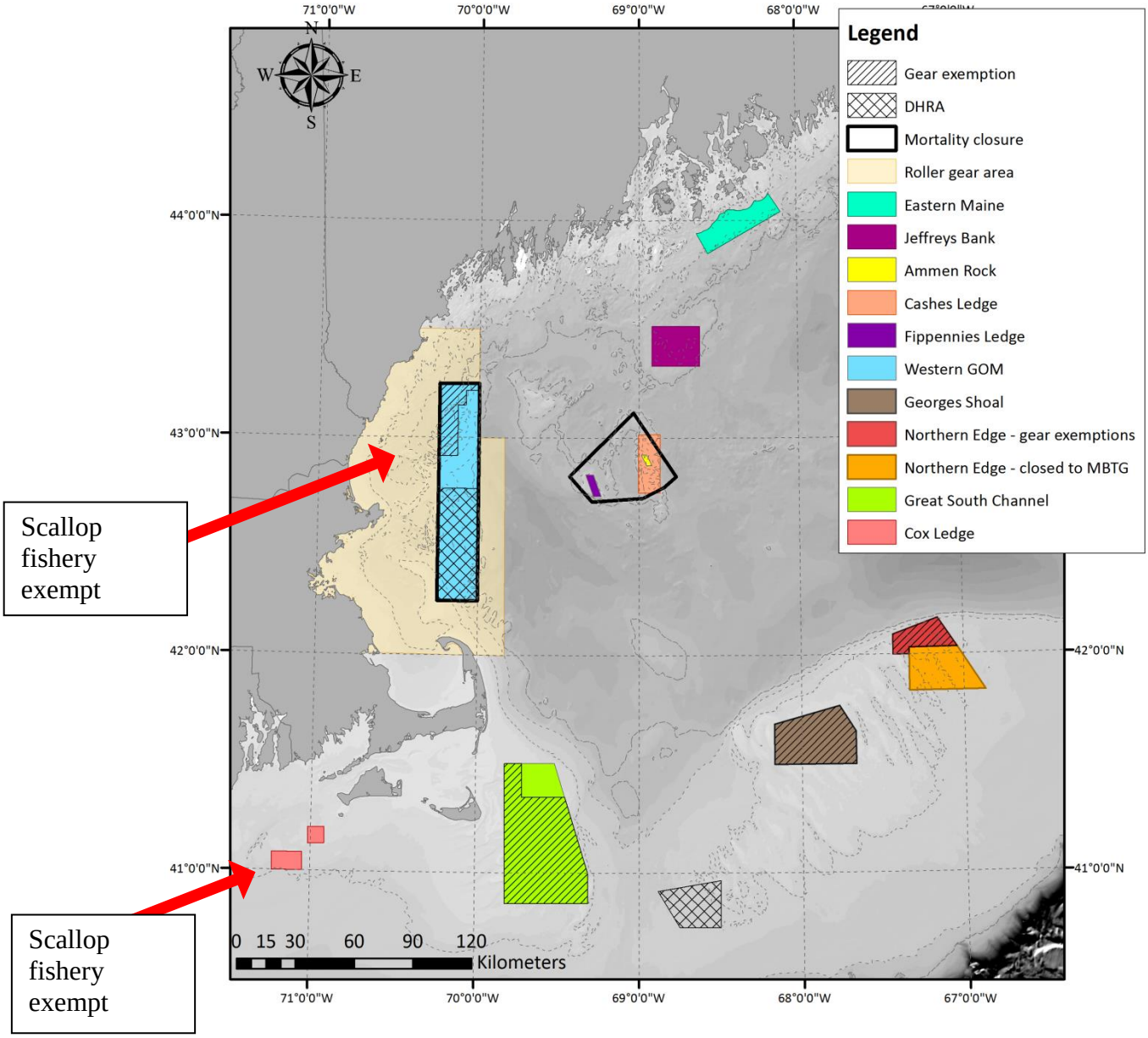
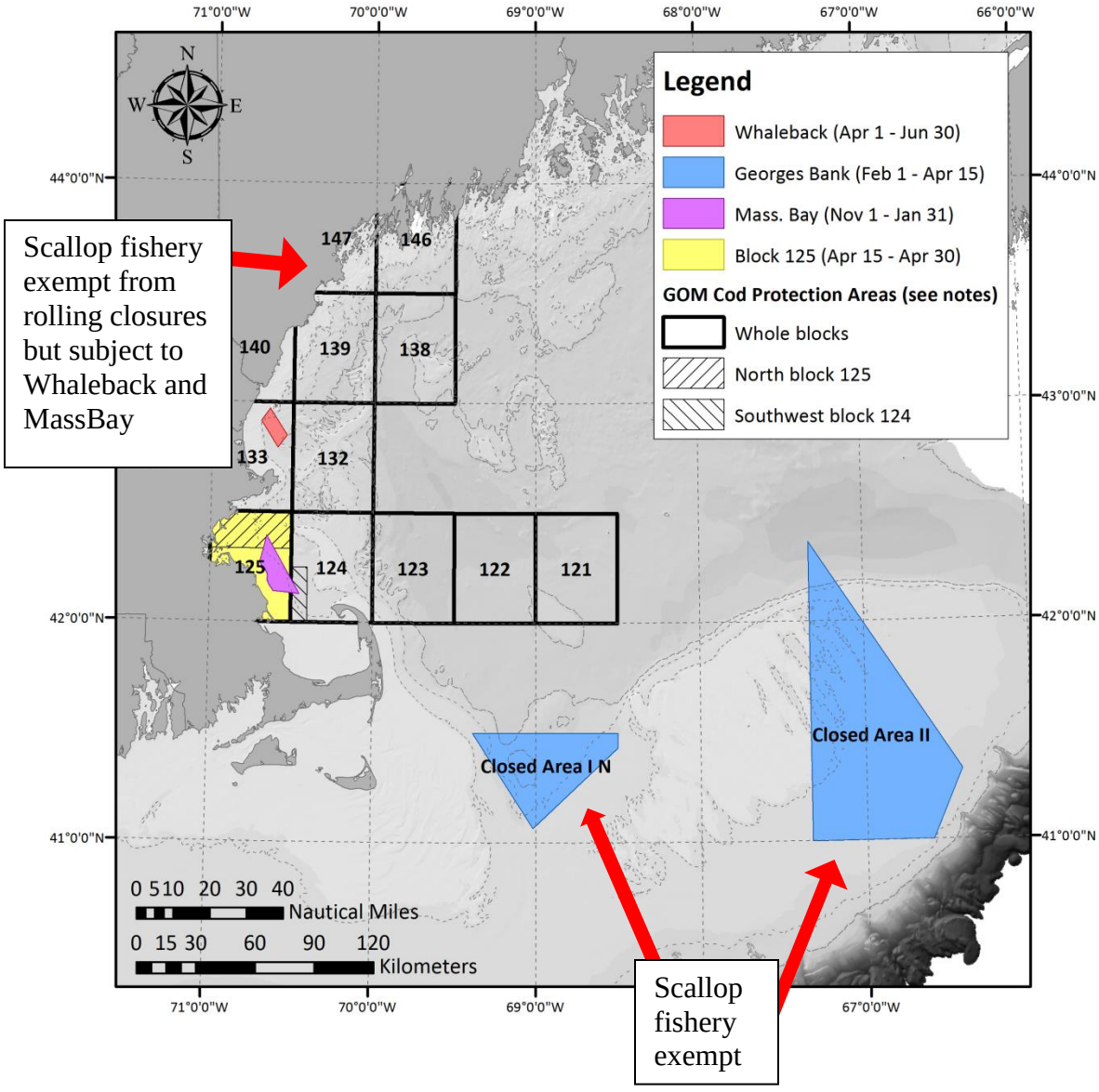


Figure 28 – Preferred alternative seasonal spatial management areas. Year-round areas not shown.

GOM COD PROTECTION CLOSURES	SPAWNING AREAS
Closed to commercial gears with various exemptions Nov-Jan: 125 and 124 (southwest corner of 124 only) Feb: None Mar: 121, 122, and 123 (all areas common pool only) April: None** May: 125 (northern part only), 132, 133, 138, 139, 140 June: 125 (northern part only), 132, 139, 140, 146, 147 July-September: None October: 124 and 125 (both areas common pool only)	-- Whaleback and Massachusetts Bay Cod Spawning Protection Areas have the same gear restrictions, i.e. closed to commercial and recreational gears with various exemptions -- Georges Bank areas closed to various commerical and recreational gears capable of catching groundfish, with various exemptions, including scallop dredges ** Block 125 in April is not part of Cod Protection Closures, but was added by Council in June as a spawning area from April 15 - April 30



4.3 PROTECTED RESOURCES

The following protected species are found in the environment in which the sea scallop fishery is prosecuted. A number of them are listed under the Endangered Species Act of 1973 (ESA) as endangered or threatened, while others are identified as protected under the Marine Mammal Protection Act of 1972 (MMPA). An update and summary is provided in Table 33 to facilitate consideration of the species most likely to interact with the scallop fishery relative to the preferred alternative.

Table 33 – Protected species that may occur in the affected environment of the sea scallop fishery

Species	Status	Potentially affected by this action?
Cetaceans		
North Atlantic right whale (*Eubalaena glacialis*)	Endangered	No
Humpback whale (*Megaptera novaeangliae*)[1]	Protected (MMPA)	No
Fin whale (*Balaenoptera physalus*)	Endangered	No
Sei whale (*Balaenoptera borealis*)	Endangered	No
Blue whale (*Balaenoptera musculus*)	Endangered	No
Sperm whale (*Physeter macrocephalus*	Endangered	No
Minke whale (*Balaenoptera acutorostrata*)	Protected(MMPA)	No
Pilot whale (*Globicephala spp.*)[2]	Protected(MMPA)	No
Risso's dolphin (*Grampus griseus*)	Protected(MMPA)	No
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected(MMPA)	No
Short Beaked Common dolphin (*Delphinus delphis*)[3]	Protected(MMPA)	No
Spotted dolphin (*Stenella frontalis*)	Protected(MMPA)	No
Striped dolphin (*Stenella coeruleoalba*)	Protected(MMPA)	No
Beaked whales (*Ziphius and Mesoplodon spp*)[4]	Protected(MMPA)	No
Bottlenose dolphin (*Tursiops truncatus*)[5]	Protected(MMPA)	No
Harbor porpoise (*Phocoena phocoena*)	Protected(MMPA)	No
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes

Green sea turtle, North Atlantic DPS (*Chelonia mydas*) (*Chelonia mydas*)[6]	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	No
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Thorny skate (*Amblyraja radiata*)	Candidate	Yes
Cusk (*Brosme brosme*)	Candidate	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected(MMPA)	No
Gray seal (*Halichoerus grypus*)	Protected(MMPA)	No
Harp seal (*Phoca groenlandicus*)	Protected(MMPA)	No
Hooded seal (Cystophora cristata)	Protected(MMPA)	No
Critical Habitat		
North Atlantic Right Whale[7]	Protected (ESA)	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	Protected(ESA)	No

Notes:
[1] On September 8, 2016, a final rule was issued revising the ESA listing status of humpback whales (81 FR 62259). Fourteen DPSs were designated: one as threatened, four as endangered, and nine as not warranting listing. The DPS found in U.S. Atlantic waters, the West Indies DPS, is delisted under the ESA; however, this DPS is still protected under the MMPA.
[2] There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.
[3] Prior to 2008, this species was called "common dolphin."
[4] There are multiple species of beaked whales in the Northwest Atlantic. They include the cuvier's (*Ziphius cavirostris*), blainville's (*Mesoplodon densirostris*), gervais' (*Mesoplodon europaeus*), sowerbys' (*Mesoplodon bidens*), and trues' (*Mesoplodon mirus*) beaked whales. Species of *Mesoplodon*; however, are difficult to identify at sea, and therefore, much of the available characterization for beaked whales is to the genus level only.
[5] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.
[6] On April 6, 2016, a final rule was issued removing the current range-wide listing of green sea turtles and, in its place, listing eight green sea turtle DPSs as threatened and three DPSs as endangered (81 FR 20057). The green sea turtle DPS located in the Northwest Atlantic is the North Atlantic DPS of green sea turtles; this DPS is considered threatened under the ESA.

[7]Originally designated June 3, 1994 (59 FR 28805); Expanded and revised on January 27, 2016 (81 FR 4837).

In Table 33, please note that cusk and thorny skate, NMFS "candidate species" under the ESA, occur in the affected environment of the scallop fishery. Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA and also include those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. Once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, these species will not be discussed further in this section. However, for additional information on cusk or thorny skate, please visit:
http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm

4.3.1 Species and Critical Habitat Not Likely to be Affected by the Alternatives Under Consideration

Based on available information, it has been determined that this action is not likely to affect any ESA listed or non-listed species of marine mammals (cetaceans or pinnipeds), shortnose sturgeon, or Atlantic salmon. Further, this action is not likely to adversely modify or destroy the Northwest Atlantic Ocean DPS of loggerhead or North Atlantic right whale critical habitats. This determination has been made because either the occurrence of the species is not known to overlap with the scallop fishery and/or there have never been documented interactions between the species and the scallop fishery. In the case of critical habitat, this determination has been made because the scallop fishery will not affect the essential physical or biological features of North Atlantic right whale or loggerhead (Northwest Atlantic Ocean DPS) critical habitat, and therefore, will not result in the destruction or adverse modification of either species designated critical habitat. For additional details on the rationale behind these conclusions, please see Section 4.3.1 of Framework 26 to the Scallop FMP (http://s3.amazonaws.com/nefmc.org/Final-FW26_submission_150217.pdf).

Species Potentially Affected by the Alternatives Under Consideration

As noted in Table 35, ESA listed species of sea turtles and Atlantic sturgeon occur in the affected environment of the scallop fishery and have the potential to be affected by this fishery and the proposed Alternatives. To understand the potential risks these Alternatives pose to these listed species, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) records of protected species interaction with particular fishing gear types. In the sections below, information on sea turtle and Atlantic sturgeon occurrence in the affected environment of the scallop fishery, in addition to species interactions with scallop fishery gear, will be provided.

4.3.1.1 Sea Turtles

4.3.1.1.1 Occurrence and Distribution

During the development of Framework 26 to the Scallop fishery, the PDT used various sources of information to describe the occurrence and distribution of sea turtles in the affected environment of the scallop fishery. Below, the PDT provides a summary of the information provided in FW 26, with any updates since the issuance of the framework provided. For additional details on the sources of information used to develop this section, please refer to

section 4.3.2.1 of Framework 26. Further, additional background information on the range-wide status of affected sea turtles species, as well as a description and life history of each of these species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant *et al*. 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS *et al*. 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

- **Hard-shelled sea turtles**

Distribution. In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill *et al*. 2008; Braun & Epperly 1996; Epperly *et al*. 1995; Mitchell *et al*. 2003; Shoop & Kenney 1992; TEWG 2009). While hard-shelled turtles are most common south of Cape Cod, MA, loggerhead sea turtles are known to occur in the Gulf of Maine, feeding as far north as southern Canada. Loggerheads have been observed in waters with surface temperatures of 7°C to 30°C, but water temperatures ≥11°C are most favorable (Epperly *et al*. 1995; Shoop & Kenney 1992). Sea turtle presence in U.S. Atlantic waters is also influenced by water depth. While hard-shelled turtles occur in waters from the beach to beyond the continental shelf, they are most commonly found in neritic waters of the inner continental shelf (Blumenthal *et al*. 2006; Braun-McNeill & Epperly 2004; Griffin *et al*. 2013; Hawkes *et al*. 2006; Hawkes *et al*. 2011; Mansfield *et al*. 2009; McClellan & Read 2007; Mitchell *et al*. 2003; Morreale & Standora 2005).

Seasonality. Hard-shelled sea turtles occur year-round in waters south of Cape Hatteras, North Carolina. As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2004; Epperly *et al*. 1995; Epperly, Braun & Veishlow 1995; Griffin *et al*. 2013; Morreale & Standora 2005), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall. By December, most sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further (Epperly *et al*. 1995; Griffin *et al*. 2013; Hawkes *et al*. 2011; Shoop & Kenney 1992). Based on this information, as well as review of observed sea turtle interactions with bottom tending gear in the affected environment of the scallop fishery (see Figure 23), hard-shelled sea turtles are most likely to be present in areas that overlap with the scallop fishery in the Mid-Atlantic between May and October and to a lesser extent, November and December (see Section 4.3.2.1 of Framework 26 for complete summary of information).

- **Leatherback sea turtles**

Leatherback sea turtles also engage in routine migrations between northern temperate and tropical waters (Dodge *et al*. 2014; James *et al*. 2005; James *et al*. 2006; NMFS & USFWS 1992). Leatherbacks, a pelagic species, are also known to use coastal waters of the U.S. continental shelf (Dodge *et al*. 2014; Eckert *et al*. 2006; James *et al*. 2005; Murphy *et al*. 2006). Leatherbacks have a greater tolerance for colder water in comparison to hard-shelled sea turtles.

They are also found in more northern waters later in the year, with most leaving the Northwest Atlantic shelves by mid-November (Dodge *et al.* 2014; James *et al*. 2005; James *et al*. 2006).

4.3.1.1.2 Gear Interactions

g As described in section 4.3.2.1.1, sea turtles are widely distributed in the waters of the Northwest Atlantic, although their presence varies with the seasons due to changes in water temperature (Shoop and Kenney 1992; Epperly *et al.* 1995a, 1995b; Braun and Epperly 1996; Mitchell *et al.* 2003; Braun-McNeill *et al.* 2008; TEWG 2009; Braun-McNeill and Epperly 2004; Morreale and Standora 2005; Griffin *et al.* 2013; NMFS and USFWS 1992; James *et al.* 2005, 2006; Dodge *et al.* 2014). As a result, sea turtles often occupy many of the same ocean areas utilized for commercial fishing and therefore, interactions with fishing gear is possible. In the sea scallop fishery, dredge and trawl gear are used to target scallops and are known to pose a risk to sea turtles (Henwood and Stuntz 1987; Lutcavage and Lutz 1997; Epperly *et al*. 2002; Sasso and Epperly 2006; Haas *et al*. 2008; Murray 2011; Warden 2011a,b; NMFS 2012b).

Although sea turtle interactions with scallop trawl and dredge gear have been observed in the Gulf of Maine, Georges Bank, and the Mid-Atlantic, most of the observed interactions have occurred in the Mid-Atlantic.[1] There is insufficient data available to conduct a robust model-based analysis to estimate sea turtle interactions with scallop trawl or dredge gear outside the Mid-Atlantic. As a result, the bycatch estimates and most of the discussion below are based on observed sea turtle interactions in scallop trawl and dredge gear in the Mid-Atlantic.

- **Sea Scallop Dredge Gear**

Kemp's ridley, green, loggerhead, and unknown sea turtle species have been documented interacting with sea scallop dredge gear; loggerhead sea turtles are the most commonly taken species. Two regulations have been implemented to reduce serious injury and mortalities to sea turtles resulting from interactions with sea scallop dredges:

- (1) **Chain mat modified dredge** (71 FR 50361, August 25, 2006; 71 FR 66466, November 15, 2006; 73 FR18984, April 8, 2008; 74 FR 20667, May 5, 2009; 76 FR 22119, April 21, 2015): Requires federally permitted scallop vessels fishing with dredge gear to modify their gear by adding an arrangement of horizontal and vertical chains (referred to as a "chain mat"). The purpose of the chain mat is to prevent captures in the dredge bag and injury and mortality that results from such capture. It should be noted; however, that although the chain may is expected to reduce the impact of sea turtle takes in dredge gear, it does not eliminate the take of sea turtles; and

- (2) **Turtle Deflector Dredge** (77 FR 20728, April 6, 2012; 76 FR 22119, April 21, 2015)**:** All limited access scallop vessels, as well as Limited Access General Category vessels with a dredge width of 10.5 feet or greater, must use a Turtle Deflector Dredge (TDD) to deflect sea turtles over the dredge frame and bag rather than under the cutting bar, so as to reduce sea turtle injuries due to contact with the dredge frame on the ocean bottom (including being crushed under the dredge frame). As of May 2015, both gear modifications (the TDD and the chain mat)

[1] To date, there has been one loggerhead observed in trawl gear (top landed species was sea scallop), and two Kemp's ridleys observed in dredge gear; these observed interactions occurred on Georges Bank.

are now required in waters west of 71°W from May 1 through November 30 each year (76 FR 22119, April 21, 2015).

Based on Northeast Fisheries Observer Program data, Murray (2011) assessed loggerhead and hard-shell turtle interactions in the Mid-Atlantic sea scallop fishery from 2001-2008. After the implementation of the chain-mat requirements, the average annual observable interactions of hard shelled sea turtles and scallop dredge gear dropped to 20 turtles (95% CI=3-42; 3 adult equivalents; Table 23). Further, as stated by Murray (2011), "if the rate of observable interactions from dredges without chain mats had been applied to trips with chain mats, the estimated number of observable and inferred interactions of hard-shelled species after chain mats were implemented would have been 125 turtles per year (95% CI: 88–163; 22 adult equivalents[2]; Table 23)." Most recently, Murray (2015a) estimated loggerhead interactions in the Mid-Atlantic scallop dredge fishery from 2009-2014. The average annual estimate of observable turtle interactions in scallop dredge gear was 11 loggerhead sea turtles per year (95% CI: 3-22; Murray 2015a). When the observable interaction rate from dredges without chain mats, was applied to trips that used chain mats and TDDs, the estimated number of loggerhead interactions (observable and unobservable but quantifiable) was 22 loggerheads per year (95% CI: 4-67; Murray 2015a). These 22 loggerheads equate to 2 adult equivalents per year, and 1-2 adult equivalent mortalities (Murray 2015a).

Table 34 - Average annual estimated interactions of hard-shelled (unidentified and loggerhead species pooled) and loggerhead turtles in the Mid-Atlantic scallop dredge fishery before and after chain mats were required on dredges (CV and 95% Confidence Interval).

AE = adult equivalent estimated interactions. **A**= estimated interactions from dredges without chain mats; B = estimated observed interactions from dredges with or without chain mats; **C** = estimated observed and unobserved, quantifiable interactions from dredges without chain mats, to estimate the mat's maximum conservation value (*Source*: Murray 2011).

	Interactions		**Interactions**	
Time Period	Hard-shelled (including loggerheads)	AE	Loggerhead	AE
(A) 2001-25 Sept 2006	288 (0.14, 209-363)	49	218 (0.16, 149-282)	37
(B) 26 Sept 2006-2008	20 (0.48, 3-42)	3	19 (0.52, 2-41)	3
(C) 26 Sept 2006-2008	125 (0.15, 88-163)	22	95 (0.18, 63-130)	16

[2] Adult equivalence considers the reproductive value of the animal (Warden 2011; Murray 2013), providing a "common currency" of expected reproductive output from the affected animals (Wallace *et al*. 2008), and is an important metric for understanding population level impacts (Haas 2010).

- **Sea Scallop Trawl Gear**

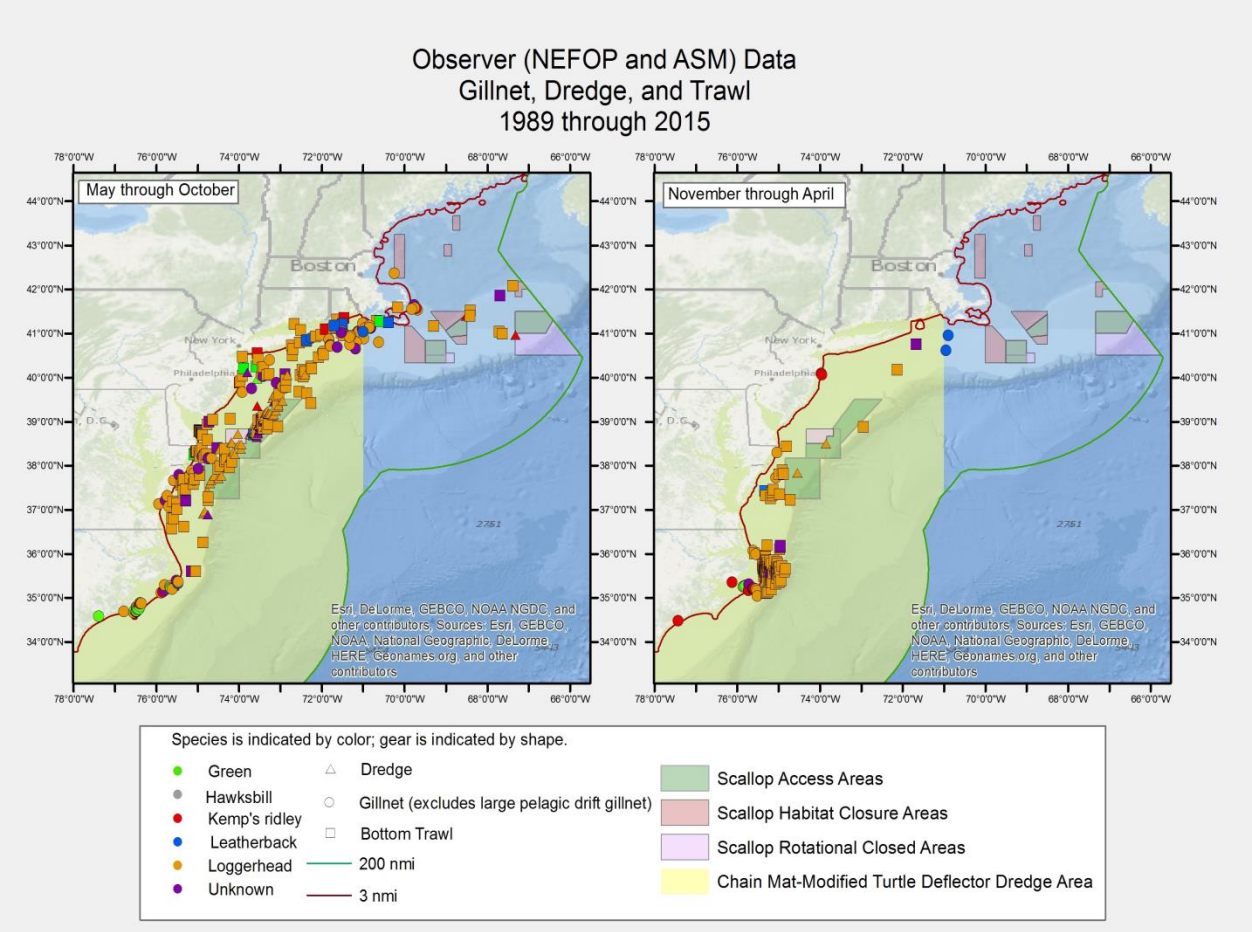
Green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles have been documented interacting with bottom trawl gear. However, estimates are available only for loggerhead sea turtles. Warden (2011a) estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border) was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but being released through a Turtle Excluder Device.[3] Of the 292 average annual observable loggerhead interactions, approximately 44 of those were adult equivalents (Warden 2011a). Most recently, Murray (2015b) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., defined by the boundaries of the Mid-Atlantic Ecological Production; roughly waters west of 71oW to the North Carolina/South Carolina border) was 231 (CV=0.13, 95% CI=182-298). Of the 231 total average annual loggerhead interactions, approximately 33 of those were adult equivalents (Murray 2015b).These latter estimates are a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated to be 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). Based on data collected by observers for reported sea turtle captures in bottom otter trawl gear from 2005-2008, Warden (2011b), using species landed, also estimated total loggerhead interactions attributable to managed species. The estimated average annual bycatch of loggerhead sea turtles in bottom otter trawl gear for trips primarily landing scallops during 2005-2008 was 95 loggerheads (95% CI =60-140; Warden 2011b). Murray (2015b) provided similar estimates of loggerhead interactions by managed fished species from 2009-2013. Specifically, an estimated average annual take of six loggerheads (95% CI=0-23) were attributed to the scallop fishery.

Summary of Observed Locations of Turtle Interactions with Scallop Dredge, Bottom Trawl, and Gillnet Gear

Figure 29 provides a depiction of the overall observed locations of sea turtle interactions with gillnet, bottom trawl (fish, scallop, and twin), and sea scallop dredge (bottom tending) gear in the Northeast Region from 1989-2015 during the months of May-October and November through April (a period of lower to no sea turtle occurrence in the Northeast Region. For additional information, please see Section 4.3 of Framework 26 of the Scallop FMP.

[3] Warden (2011a) and Murray (2013, 2015b) define the mid-Atlantic slightly differently, but both include waters north to Massachusetts. See the respective papers for a more complete description of these areas.

Figure 29 – Observed location of turtle interactions in bottom tending gears in the Northeast Region (1989-2015)



4.3.1.2 Atlantic Sturgeon

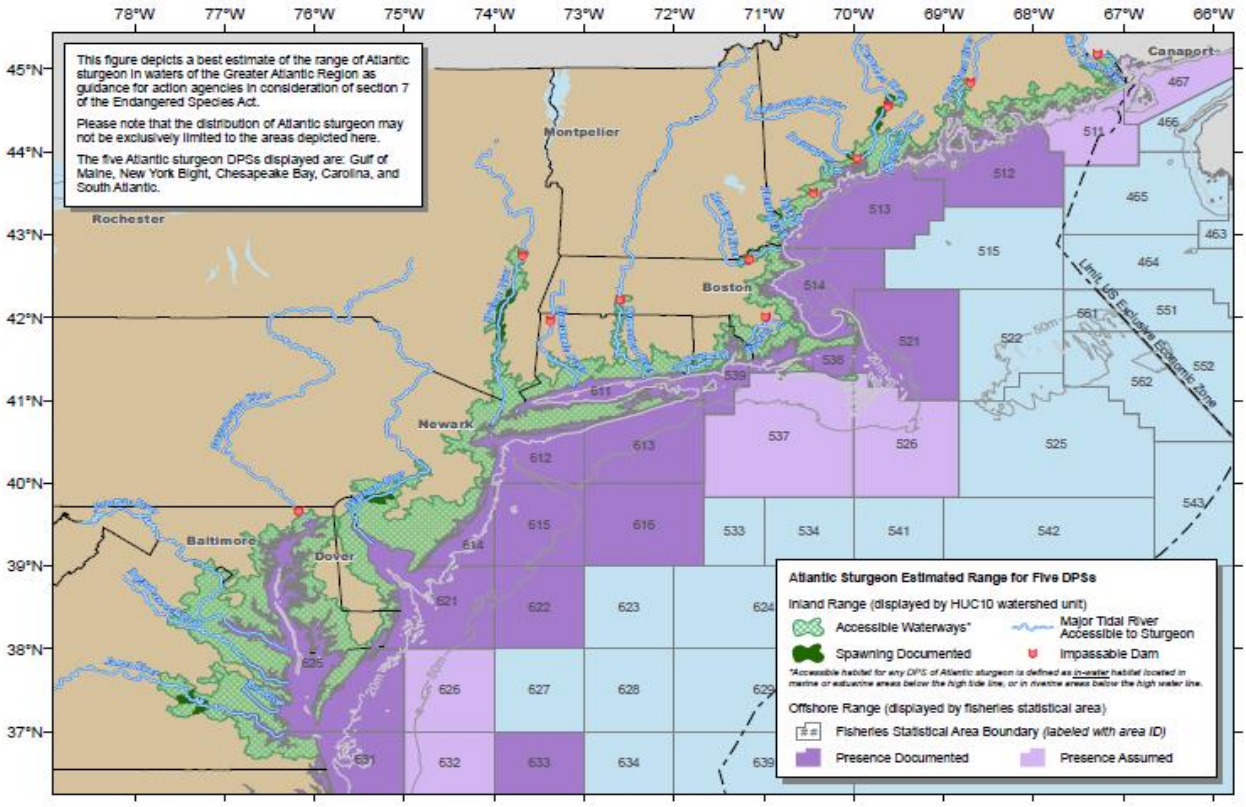
4.3.1.2.1 Atlantic Sturgeon Distribution

During the development of Framework 26 to the Scallop fishery, the PDT used various sources of information to describe the occurrence and distribution of Atlantic sturgeon DPSs in the affected environment of the scallop fishery. Below, the PDT provides a summary of the information provided in FW 26, with any updates (i.e., literature) since the issuance of the framework provided. For additional details on the information below please refer to section 4.3.2.2.2 of Framework 26. Further, additional information on the biology, status, and range wide distribution of each distinct population segment of Atlantic sturgeon please refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007).

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (See; ASSRT 2007; Dovel and Berggren 1983; Dadswell *et al*. 1984; Kynard *et al*.

2000; Stein *et al*. 2004a; Dadswell 2006; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011; Wirgin *et al*. 2012; Waldman *et al.* 2013; O'Leary *et al*. 2014; Wirgin *et al*. 2015). In fact, several genetic studies, have been conducted to address DPS distribution and composition in marine waters (Wirgin *et al*. 2012; Damon-Randall *et al*. 2013; Waldman *et al*. 2013; O'Leary *et al.* 2014; Wirgin *et al*. 2015). Using samples from Atlantic sturgeon captured from various marine aggregation sites along the Northeast coast, results from these studies showed that these aggregations, regardless of location, were comprised of all 5 DPSs of Atlantic sturgeon; however, each DPS comprised various percentages of the aggregation depending on the area along the coast the aggregation was found and sampled (Wirgin *et al*. 2012; Damon-Randall *et al*. 2013; Waldman *et al*. 2013; O'Leary *et al*. 2014).[4]

Figure 30 – Estimated range of Atlantic Sturgeon Distinct Population Segments (DPSs)



Source: http://www.greateratlantic.fisheries.noaa.gov/protected/section7/guidance/maps/atlanticsturgeon.pdf.pdf

Based on fishery- independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein *et al*. 2004 a,b; Erickson *et al*. 2011; Dunton *et al*. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper

[4] Within the marine range of Atlantic sturgeon, several marine aggregation areas have been identified adjacent to estuaries and/or coastal features formed by bay mouths and inlets along the U.S. eastern seaboard. For specific information on these various aggregation areas please see: Stein *et al*. 2004a; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011; Oliver *et al*. 2013; Bath *et al*. 2000; Savoy and Pacileo2003; and Waldman *et al*. 2013.

continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein *et al.* 2004a,b; Dunton *et al*. 2010; Erickson *et al*. 2011)). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon undertake seasonal movements along the coast (Dunton *et al*. 2010; Erickson *et al*. 2011). In general, analysis of fishery-independent survey data indicates a coastwide distribution of Atlantic sturgeon from the spring through the fall, with Atlantic sturgeon being more centrally located (e.g., Long Island to Delaware) during the summer months; and a more southerly (e.g., North Carolina, Virginia) distribution during the winter (Dunton *et al*. 2010; Erickson *et al*. 2011). Although studies such as Erickson *et al*. (2011) and Dunton *et al*. (2010) provide some indication that Atlantic sturgeon are undertaking seasonal movements horizontally and vertically along the U.S. eastern coastline, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year.

4.3.1.2.2 Gear Interactions

According to the NMFS Opinion on the sea scallop fishery issued on July 12, 2012, it was determined that some small level of bycatch may occur in the scallop fishery; ; however, the incidence rate is likely to be very low.. Review of available observer data from 1989-2014 confirms this determination. No Atlantic sturgeon have been reported as caught in scallop bottomtrawl gear where the haul target or trip target is scallop. However, NEFOP and ASM observer data have recorded one (1) Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NMFS NEFSC FSB 2015).

4.4 ECONOMIC AND SOCIAL ENVIRONMENT

See Addendum 1 (next section)

Table 35 - DAS and access area allocations per full-time vessel

Year	Action	DAS	AA trips	Year	CA1	CAII	NLS	VB	HC	ETA	DMV	Possession
1999	FW11	120	3	1999	Closed	3 trips: byc clo	Closed	Closed	Closed	N/A	N/A	10,000
2000	FW12	120	6	2000	2 trips	3 trips	1 trip	Closed	Closed	N/A	N/A	10,000
2001	FW14	120	3 (MA)	2001	Closed	Closed	Closed		3 trips	N/A	N/A	17,000
2002	FW14	120	3 (MA)	2002	Closed	Closed	Closed		3 trips	N/A	N/A	18,000
2003	FW15	120	3 (MA)	2003	Closed	Closed	Closed		3 trips	N/A	N/A	21,000
2004	FW16 - GB AA allocations; A10 and	42	7 (4 MA)	2004	Closed	2 trips	1 trip		4 trips	Closed	N/A	18,000
2005	FW16	40	5 (3 MA)	2005	1 trip	1 trip	Closed		3 trips	Closed	N/A	18,000
2006	FW18	52	5 + HC carryover (F18 also allowed vessels to exchange 2006 CA2 and NLS trips for ETA 2007 trips)	2006	Closed	3 trips: byc clo	2 trips: bycatch closure		open for 2005 carryover trips	Closed	N/A	18,000
2007	FW18/FW20	51	5 + HC carryover (F18 also allowed vessels to exchange 2006 CA2 and NLS trips for ETA 2007 trips)	2007	1 trip	Closed	1 trip		open for 2005 carryover trips	3 trips	Closed (Jan 1, 2007)	18,000
2008	FW19	35	5 (4 MA)	2008	Closed	Closed	1 trip: bycatch closure		Closed	4 trips	Closed	18,000
2009	FW19	42	5 (4 MA)	2009	Closed	1 trip: bycatch closure	Closed		Closed	3 trips	1 trip	18,000
2010	FW21	38	4 (3 MA)	2010	Closed	Closed	1 trip		Closed	2 trips	1 trip	18,000
2011	FW22	32	4 (2 MA)	2011	1.5 trips (all 313 vessels get 1 trip, 156 vessels get additional trip)	0.5 trips (157 vessels)	Closed (NLS emergency closure by Mar 1, FW22 cont.)		1 trip (313 vesels)	converted to open area	1 trip	18,000
2012	FW22	34	4	2012	1 trip after emergency action May 2012 (157 vessels get initial trip per FW22 and 156 get CA1 trip	1 trip (313 vesels)	0.5 trips (157 vessels)		1.5 trips (all 313 vessels get 1 trip, 156 vessels get	Closed (Dec 12, 2012, emergenc	Closed (May 2012 EmAc closed DMV and reallocated trips	18,000
2013	FW24	33	2	2013	118 trips (FW25 later allows unused trips to carryover to future year)	182 trips	116 trips		210 trips	Closed	Closed	13,000
2014	FW25	31	2	2014	Closed	197 trips	116 trips		Closed	Closed	313 trips (with pot. to opt for 5 DAS)	12,000
2015	FW26	30.86	3	2015	Closed	Closed	Closed		MAAA Open - 51,000 lbs, 17,000lb trips limit (ETC in place)			
2016	FW27	34.55	3	2016	Closed	Closed	LAGC IFQ Access - 485 Trips		MAAA Open - 51,000 lbs, 17,000lb trips limit (ETC in place)			17,000

ADDENDUM 1
Economic and Social Trends in the Atlantic Sea Scallop Fishery

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1.1 Economic and social Trends in the Sea Scallop Fishery

1.1.1 Introduction

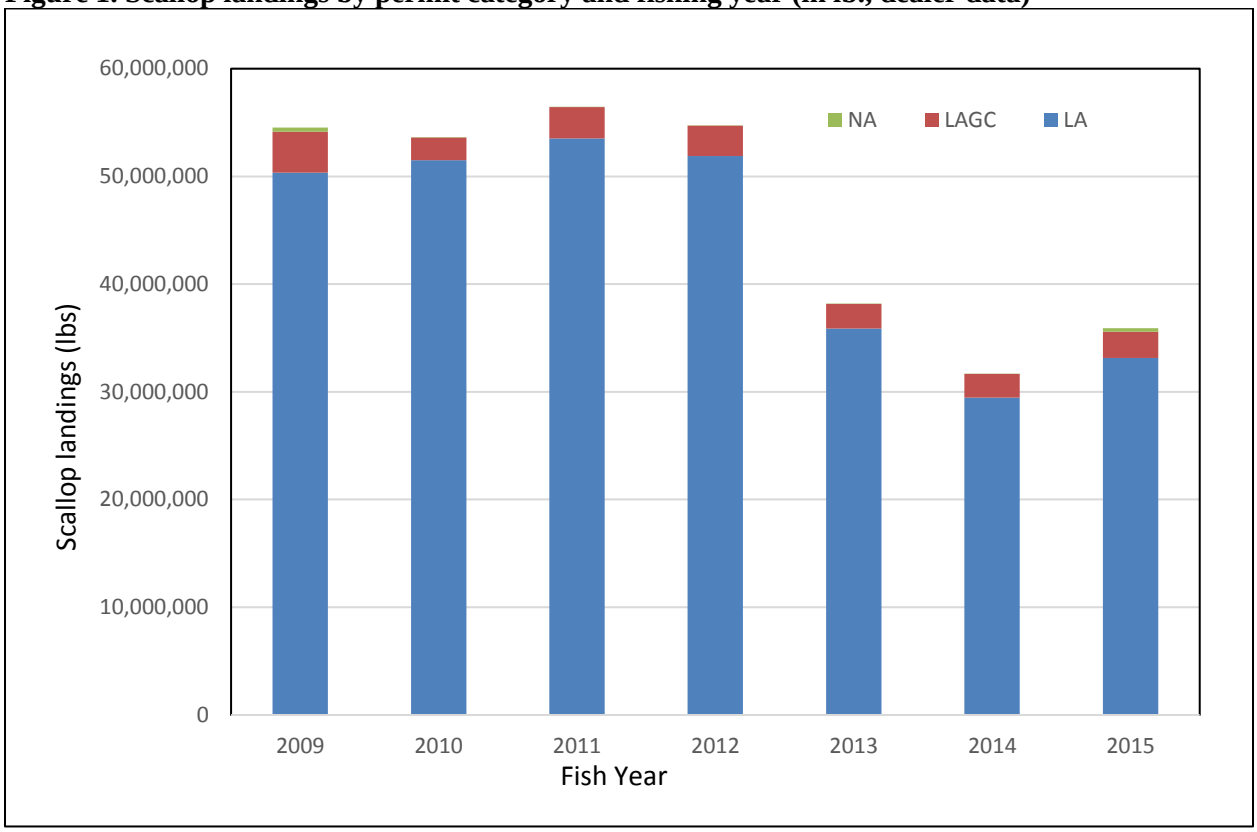
This section of the document describes the economic and social trends of the scallop fishery, including trends in landings, revenues, prices and foreign trade for the sea scallop fishery since 2009. In addition, it provides background information about the scallop fishery in various ports and coastal communities in the Northeast.

1.2.1 Trends in landings, prices and revenues

During the period from fishing year 2009 to 2015, the scallop landings ranged from about 32 to 56 million pounds. The recovery of the scallop resource and consequent increase in landings and revenues was striking given that average scallop landings per year were below 16 million pounds during the 1994-1998 fishing years. However, the landings from the Northeast sea scallop fishery fell to 38.2 million pounds in 2013 fishing year and to 31.7 million pounds in the 2014 fishing year for the first time since 2001. In 2015, landing increased by about 4 million pounds to 35.9 million pounds ((Table 17 and
Figure 1).

The increase in the abundance of scallops coupled with higher scallop prices increased the profitability of fishing for scallops by the general category vessels especially after 2002 fishing year. As a result, general category landings increased from less than 0.4 million pounds during the 1994-1998 fishing years to more than 4 million pounds during the fishing years 2005-2009, peaking at 7 million pounds in 2005 or 13.5% of the total scallop landings. The landings by the general category vessels declined after 2009 as a result of the Amendment 11 implementation that restricts TAC for the limited access general category fishery to 5.5% of the total ACL. The landings by limited access general category fishery including by IFQ, NGOM and incidental permits, declined to about 2.45 million lb. in 2015 (Table 17 and
Figure 1).

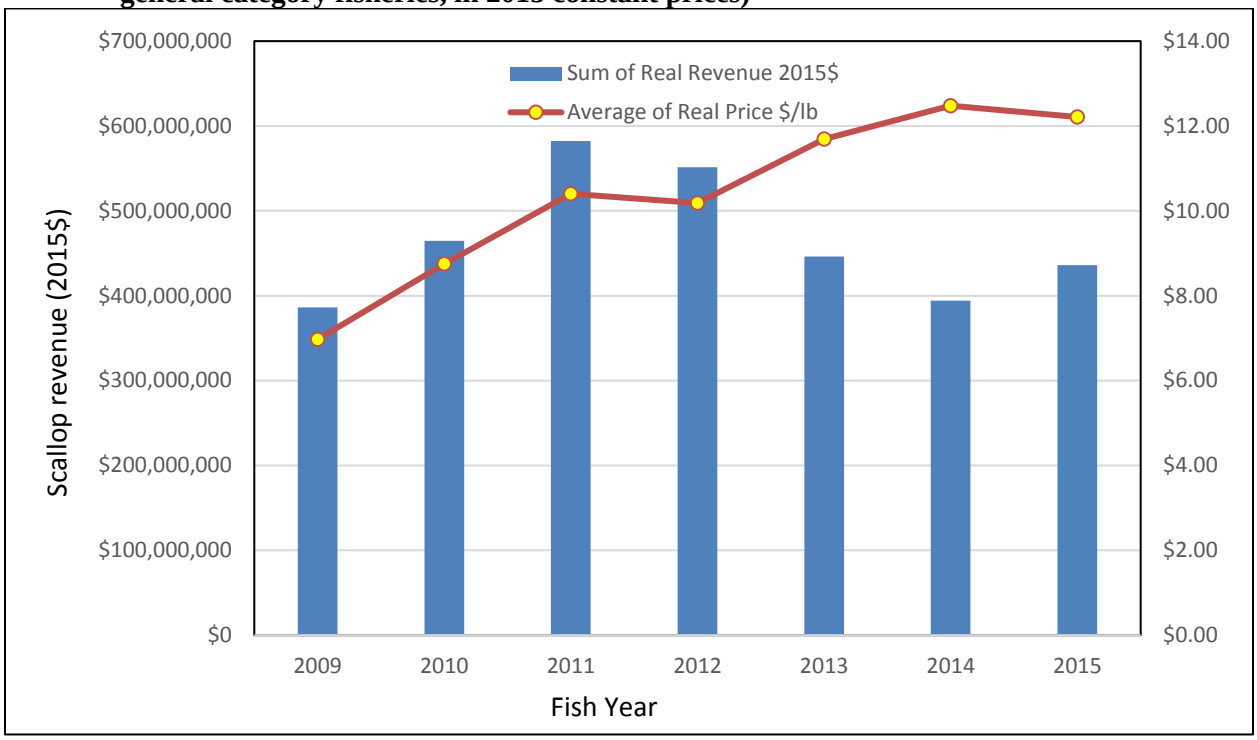
Figure 1. Scallop landings by permit category and fishing year (in lb., dealer data)



Total fleet revenue has more than quadrupled in 2011 fishing year from its level in 1994. Scallop ex-vessel prices increased after 2001 as the composition of landings changed to larger scallops that in general command a higher price than smaller scallops. However, the rise in prices was not the only factor that led to the increase in revenue in the recent years compared to 1994-1998. In fact, inflation adjusted ex-vessel prices in 2008-2009 were lower than prices in 1994. The increase in total fleet revenue was mainly due to the increase in scallop landings and the increase in the number of active scallop vessels during the same period. Scallop revenue peaked in 2011 to about $582 million, in inflation adjusted 2015 dollars, but has declined to $436 million in 2015 fishing year (Figure 2).

The ex-vessel prices increased significantly to over $10 per pound of scallops in 2011 fishing year as the decline in the value of the dollar led to an increase in exports of large scallops to the European countries resulting in record revenues from scallops for the first time in scallop fishing industry history. The scallop ex-vessel prices peaked to $12.48per lb. in 2014 due to the decline in landings by almost 44% from its peak in 2011. As a result, scallop revenue declined by a smaller percentage (32%) relative to the decline in decline in landings, from about $582 million in 2011 to $394 million in 2014 (in 2015 prices). But, the revenue has buoyed up to $436 million in 2015 due to an increase in landings by little over 4 million pounds relative to the fishing year 2014 (Figure 2).

Figure 2. Trends in total scallop revenue and ex-vessel price by fishing year (including limited access and general category fisheries, in 2015 constant prices)



The trends in landings and revenue per full-time vessel were similar to the trends for the fleet as a whole. Figure 3 shows that average scallop revenue per full-time dredge vessel reached $1.76 million in 2011 as a result of higher landings combined with an increase in ex-vessel prices. For full-time small dredge vessels, average revenue per vessel increased to over $1.38 million in 2011 (Figure 3, Figure 4). However, average scallop revenue per full-time dredge vessel declined in 2014 to $1.23 million for full-time and to $0.74 million per the full-time small dredge vessel due to the decline in landings in this fishing year. However, revenue has increased to $1.32 million and $0.93 million in 2015 due to an increase in landings for both vessel types, respectively.

Figure 3. Trends in average scallop landings per full time vessel by category (Dealer data)

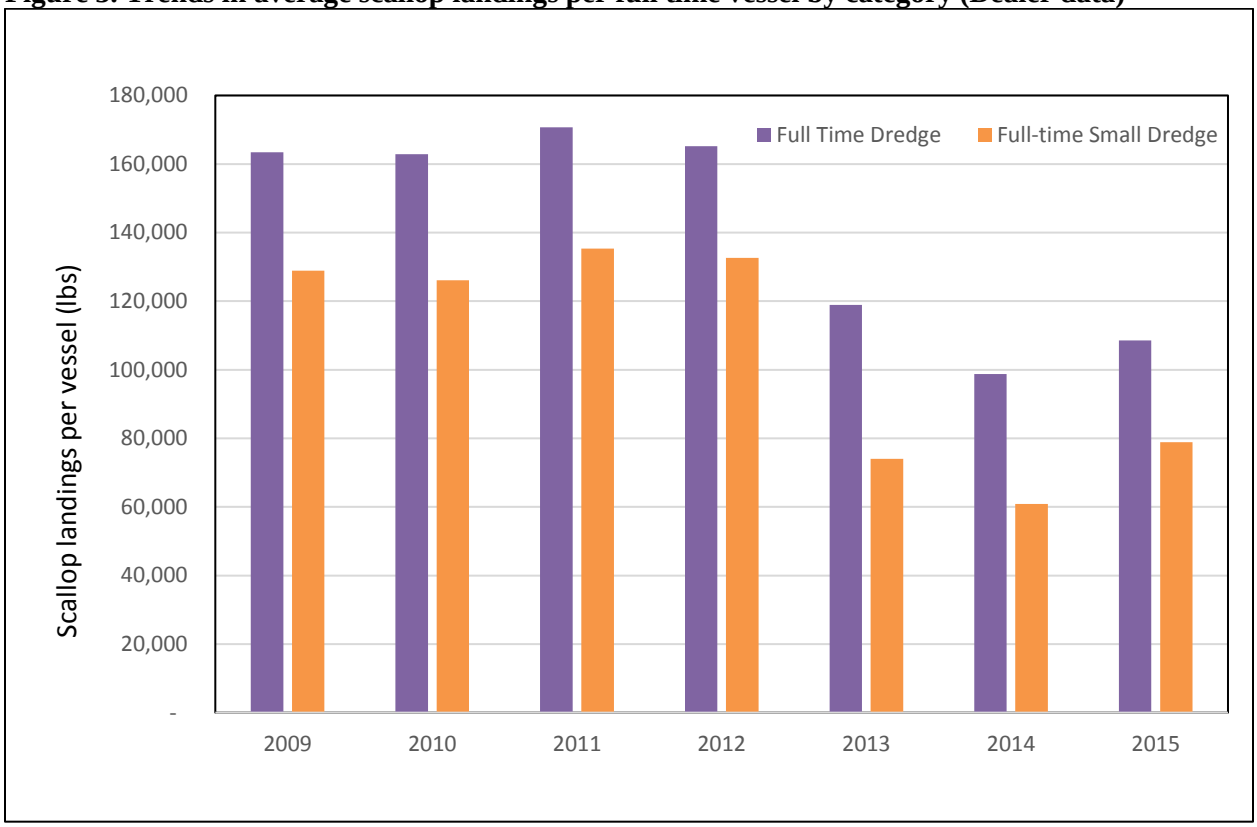
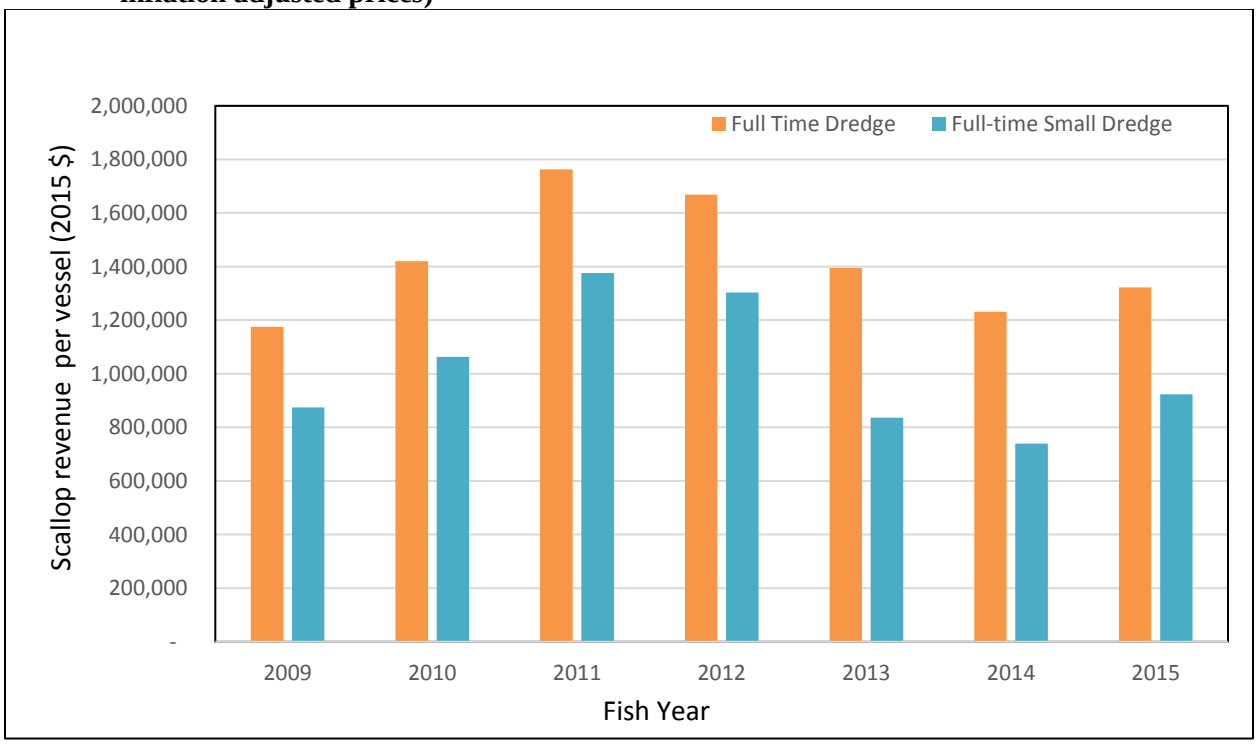
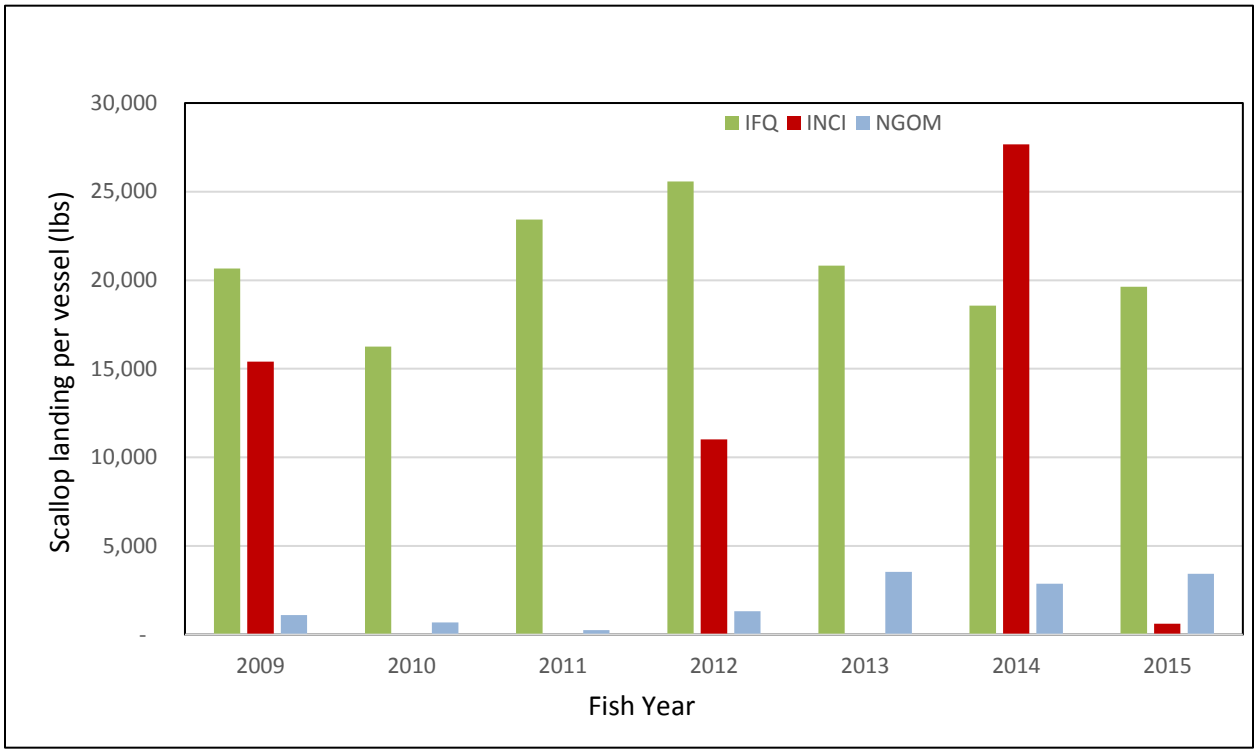


Figure 4. Trends in average scallop revenue per full-time vessel by category (Dealer data, in 2015 inflation adjusted prices)



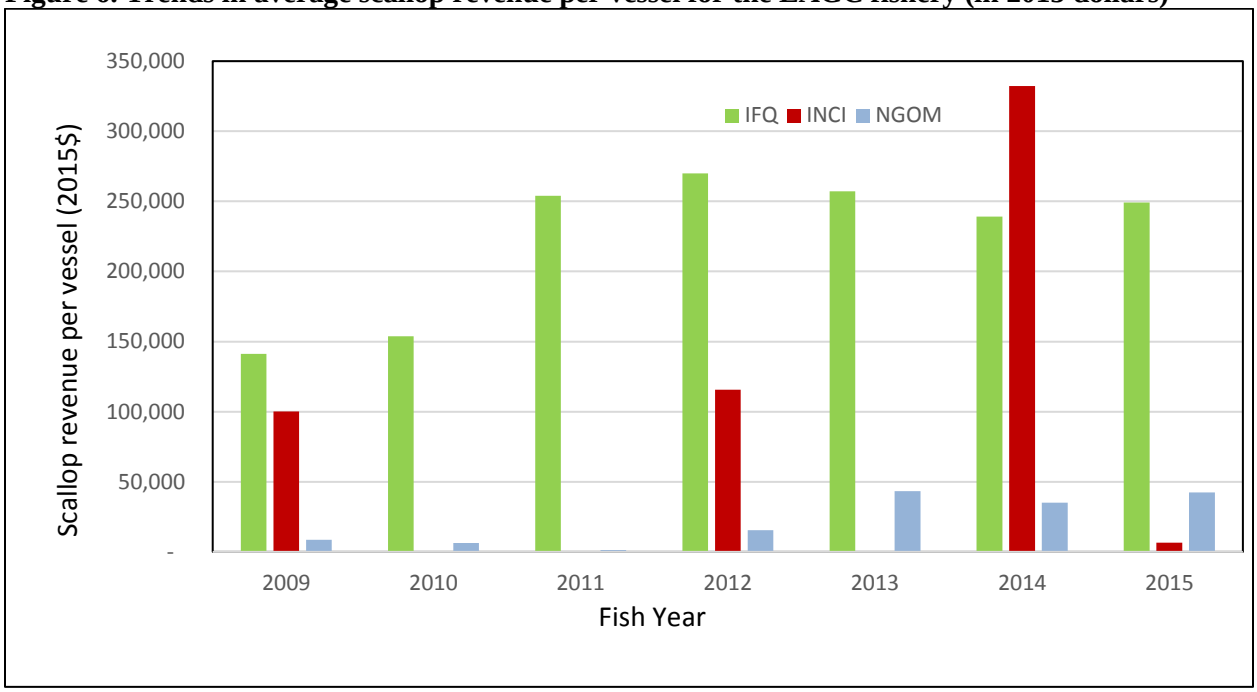
Although general category landings declined after 2009, scallop landings and revenue per active limited access general category vessel exceeded the levels in 2009 as the quota is consolidated on or fished by using fewer vessels (Figure 5 and Figure 6). It should be noted that these are estimated numbers from dealer data based on some assumptions in separating the LAGC landings from LA landings. It was assumed that if an LA vessel also had an LAGC permit, those trip landings which are less than 600 lb. in 2011 and less than 400 lb. in 2010 and 2009 were LAGC landings and any among above these were LA landings.

Figure 5. Trends in average scallop landings per vessel for the LAGC fishery by permit category



Note: Although per vessel landings for INCI permit holders in some years appears to be high compared to IFQ and NGOM permits, but total landing for the permit type is very low relative to IFQ landings.

Figure 6. Trends in average scallop revenue per vessel for the LAGC fishery (in 2015 dollars)



Note: Although per vessel landings for INCI permit holders in some years appears to be high compared to IFQ and NGOM permits, but total landing for the permit type is very low relative to IFQ landings.

1.3.1 Trends in allocations, effort and LPUE

Prior to the 1999 fishing year, the scallop fishery was managed by overall DAS allocations in the open areas. There has been a steady decline in the total open area DAS allocations from 1994 to 1998 fishing years as a result of the effort-reduction measures of Amendment 4 (Table 1). DAS allocations during this period were reduced by about 30% from 204 DAS in 1994 to 142 DAS in 1998 fishing year. Open area DAS was further reduced to 120 DAS by Amendment 7 and in frameworks 11 to 15 during the period from the 1999 fishing year to 2003 fishing year (Table 2). As a result, estimated DAS-used (VTR data) reached the lowest levels of about 24,000 days in the 1999 from over 30,000 days in 1995-1996. In recent years, the DAS averaged to about 25,000 during 2009 to 2012, but it has been on the range of 16,000 to 19,000 during 2013 to 2015 (Figure 7).

Table 1. DAS allocations per full-time vessel

Implementation Year	Allocations based on the Management Action	Total DAS Allocation
1994	Amendment 4	204
1995	Amendment 4	182
1996	Amendment 4	182
1997	Amendment 4	164
1998	Amendment 4	142

Table 2. DAS and access area allocations per full-time vessel

Year	Action	DAS	AA trips	CA1	CAII	NLS	VB	HC	ETA	DMV	Poss. Limit
1999	FW11	120	3	Closed	3 trips	Closed	Closed	Closed	N/A	N/A	10000
2000	FW12	120	6	2 trips	3 trips	1 trip	Closed	Closed	N/A	N/A	10000
2001	FW14	120	3	Closed	Closed	Closed	3 trips		N/A	N/A	17000
2002	FW14	120	3	Closed	Closed	Closed	3 trips		N/A	N/A	18000
2003	FW15	120	3	Closed	Closed	Closed	3 trips		N/A	N/A	21000
2004	FW16, A10 and EA	42	7	Closed	2 trips	1 trip	converted to open area	4 trips	Closed	N/A	18000
2005	FW16	40	5	1 trip	1 trip	Closed		3 trips	Closed	N/A	18000
2006	FW18	52	5 + HC carryover*	Closed	3 trips	2 trips		open for 2005 carryover trips	Closed	N/A	18000
2007	FW18/FW20	51	5 + HC carryover*	1 trip	Closed	1 trip		open for 2005 carryover trips	3 trips	Closed (Jan 1, 2007)	18000
2008	FW19	35	5	Closed	Closed	1 trip		Closed	4 trips	Closed	18000
2009	FW19	42	5	Closed	1 trip	Closed		Closed	3 trips	1 trip	18000
2010	FW21	38	4	Closed	Closed	1 trip		Closed	2 trips	1 trip	18000
2011	FW22 and EA	32	4	1.5 trips	0.5 trips	Closed by emergency		1 trip	converted to open area	1 trip	18000
2012	FW22 and EA	34	4	1 trip**	1 trip	0.5 trips		1.5 trips	Closed (Dec 12, 2012, by EA)	Closed by EA (trips converted to CA1)	18000
2013	FW24	33	2	118 trips***	182 trips	116 trips		210 trips	Closed	Closed	13000
2014	FW25	31	2	Closed	197 trips	116 trips		Closed	Closed	313 trips****	12000
2015	FW26	30.86	3 *****	Closed	Closed	Closed		Merged into one Mid-Atlantic AA, but inshore part of ETA closed			17000
2016	FW27	34.55	3	Closed	Closed	Closed ~		Merged into one Mid-Atlantic AA, but inshore part of ETA closed			17000

** FW18 also allowed vessels to exchange 2006 CA2 and NL trips for ETA 2007 trips*

***1 trip after emergency action May 2012 (157 vessels get initial trip per FW22 and 156 get CA1 trip converted from initial DMV trip)*

**** FW25 then allows unused trips to be carried over to future year*

***** Vessels given choice of Delmarva trip or 5 DAS*

****** Vessels were not allocated trips in access areas, instead a poundage was allocated with a possession limit*

~ NL– north open to LAGC only

Until the implementation of Amendment 10, each access area trip were assigned a 10 DAS trade-off such that any vessel that choose not to fish in access areas could instead fish for scallops in the open areas for 10 DAS. Thus, before 2004, total DAS allocation for the access areas is calculated as the number of trips multiplied by 10 DAS (even though it might have taken less than 10 DAS to land the possession limit in those areas). Following this method, Table 1 and Table 2 show that total DAS allocations for open and access areas per full-time vessel declined from 204 DAS in 1994 to 120 DAS in 2003.

After fishing year 1999, fishing effort started to increase as more limited access vessels participated in the sea scallop fishery. The increase in total effort was mostly due to the increase in the number of vessels because total DAS allocations (mostly less than 120 days) were lower than the DAS allocations in the mid-1990s (over 142 days, Table 2).

The recovery of the scallop resource and the dramatic increase in fishable abundance after 1999 increased the profits in the scallop fishery, thus leading to an increase in participation by limited access vessels that had been inactive during the previous years. Georges Bank closed areas were opened to scallop fishing starting in 1999 by Framework 11 (CAII) and later by Framework 13 (CAII, CAI, NLS), encouraging many vessel owners to take the opportunity to fish in those lucrative areas. Frameworks 14 and 15 provided controlled access to Hudson Canyon and VA/NC areas. As a result, the number of active limited access permits in the sea scallop fishery increased from 258 in 2000 to 303 in 2003. The total fishing effort by the fleet increased to about 33,000 days in 2003 from about 26,700 days in 2000 (Figure 7). Total fishing effort (DAS used) declined after 2003 even though the number of active limited access permits increased to over 330 since 2006, and to over 340 permits since 2009 (

Table 8).

With the implementation of Amendment 10 (2004) the limited access vessels were allocated DAS for open areas and area specific access area trips with no open area trade-offs. Although the vessels could no longer use their access area allocations in the open areas, Amendment 10 and Frameworks 16 to 18 continued to include an automatic DAS charge of 12 DAS for each access area trip until it was eliminated by NMFS.

Total DAS-used by the limited access vessels were higher in 2010 despite lower number of access area trips (4 trips per vessel). Open area DAS allocations were slightly higher in 2010 (38 DAS versus 37 DAS in 2009) and vessels spend more time fishing in the access areas. Total DAS-used further declined since 2011 due to the decrease in open area DAS allocations. As a result of reduction in the number of access area trips to two trips per full-time vessel in 2014 fishing year, the total DAS-used reached its lowest level in this year with a total of 16,080 days as defined by the difference in the date landed and date sailed form the VTR records (Figure 7).

Figure 7. Total DAS-used (Date landed – Date sailed from VTR data) and LPUE by all LA vessels

The impact of the decline in effort below 30,000 days since 2005 (with the exception of 2007) on scallop revenue per vessel was small, however, due to the increase in LPUE from about 1600 pounds per day-at-sea in 2007 to about 2,300 pounds per day-at-sea in 2011 and to about 1,900 lb. per day-at-sea in all areas (As estimated from date landed – date sailed from VTR data (Figure 7). Figure 8 shows that LPUE for the full-time dredge vessels was higher (about 2,200 lb. in 2013 fishing year) than the LPUE of small dredge vessels (about 1,330 lb. in 2013 fishing year). In 2015, the LPUE for the full-time dredge and small dredge vessels were 1,887 lb. and 1,281 lb., respectively (Figure 8).

It must be cautioned that these LPUE numbers are lower than the estimates used in the PDT analyses used to estimate open area DAS allocations. The numbers in Figure 7 through Figure 8 are obtained from the VTR database and include the steam time as calculated the days spent at sea starting with the sail date and ending with the landing date. In addition, those numbers include both open and access areas. In contrast, total "DAS used" in the fishery is the value incorporated in the LPUE models by the PDT to calculate future DAS allocations in the open areas for the full-time vessels. In these models, the value for DAS used comes from the field "DAS charged" from the DAS database. DAS charged is based on the time a vessel crossed the VMS demarcation line going out on a trip, and the time it crossed again coming back from a trip, so it wouldn't include the time from (to) the port to (from) the demarcation line at the start (end) of the trip. Therefore, the DAS-used (LPUE) calculated from the VTR data would be greater (lower) than the DAS-used (LPUE) calculated from the demarcation line in the DAS database.

Because VTR data is available for a longer period, however, it is useful in analyzing the historical trends in LPUE (from port to port) since 1994.

Figure 8. LPUE for full-time vessels by permit category (VTR data, includes steam time and LA vessels with IFQ permits as well)

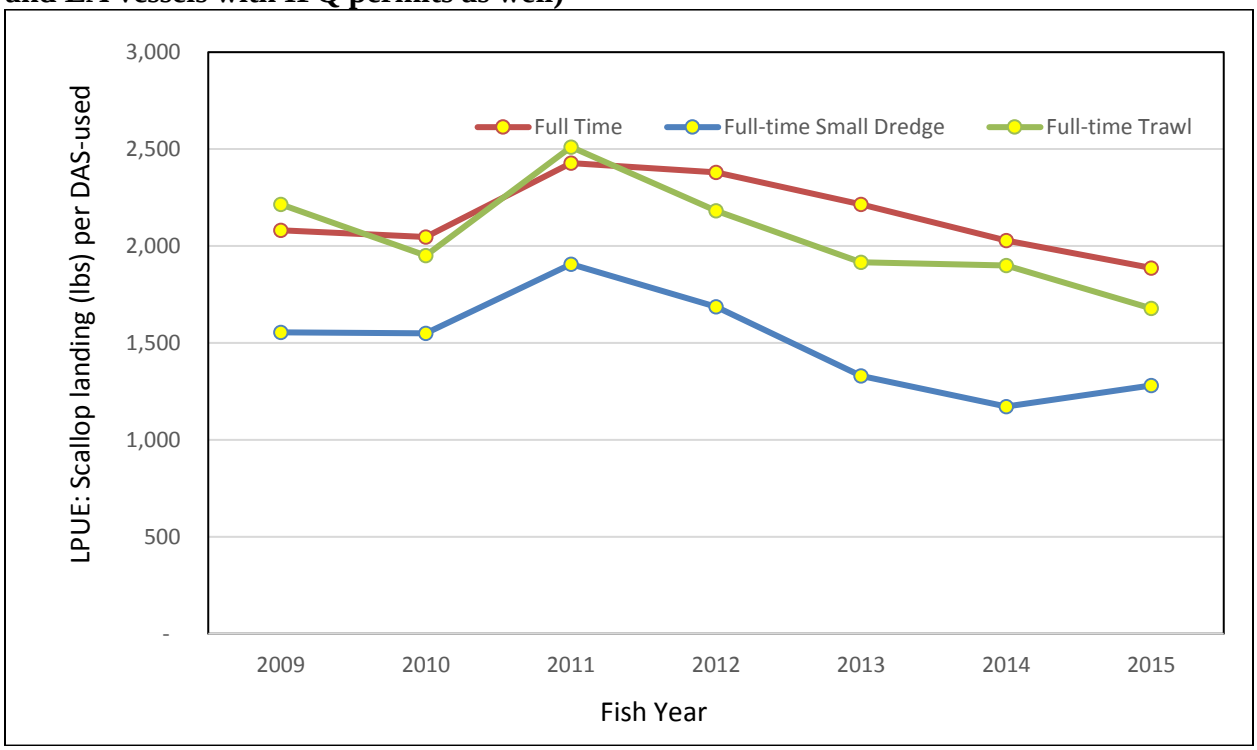
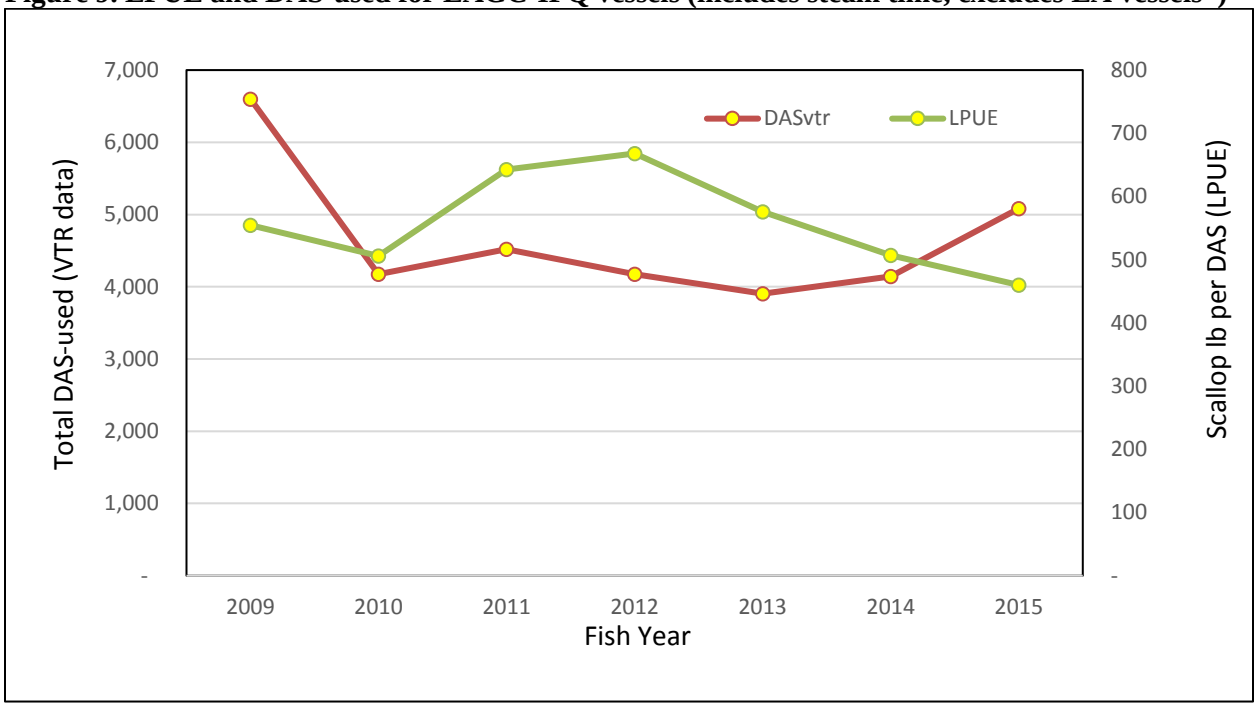


Figure 9. LPUE and DAS-used for LAGC-IFQ vessels (includes steam time, excludes LA vessels)



1.4.1 Trends in the meat count and size composition of scallops

Average scallop meat count has declined continuously since 1999 as a result of effort-reduction measures, area closures, and an increase in ring sizes implemented by the Sea Scallop FMP. The share of larger scallops increased with the share of U10 scallops rising to about 25% during 2006-2008, to 15% in 2009 -2011, to about 20% in 2012-2013 and to 26% in 2014 fishing year compared to less than 10% in 2000-2004. In 2015, the share of under U10 count declined to about 17%. Similarly, the share of 11-20 count scallops increased from 13% in 1999 to 79% in 2011, but declined to 60% in 2015 fishing year. On the other hand, the share of 21 or more count scallops declined from 68% in 1999 to about 6% in 2012, but has averaged to about 17% during 2013-15 fishing years (

Figure 13).

Table 3 Larger scallops priced higher than the smaller scallops contributed to the increase in average scallop prices especially since 2010 (

Table 7,

Figure 13).

Table 3. Scallop landings by market category (excluding unknown category)

Fish Year	Under 10 Count	11-20 Count	≥ 21 Count	Grand Total
1998	200,191	2,098,366	6,965,794	9,264,351
1999	3,690,533	2,613,754	13,561,061	19,865,348
2000	2,393,703	6,771,024	21,647,364	30,812,091
2001	1,520,424	10,783,931	29,183,755	41,488,110
2002	2,484,107	7,436,720	36,217,346	46,138,173
2003	3,644,668	12,221,010	33,600,076	49,465,754
2004	5,105,290	28,928,288	25,575,559	59,609,137
2005	6,906,267	31,608,791	12,608,882	51,123,940
2006	13,273,263	28,801,692	11,478,113	53,553,068
2007	14,903,951	32,021,763	9,745,750	56,671,464
2008	12,293,851	27,677,289	10,596,220	50,567,360
2009	8,447,407	35,717,282	12,433,688	56,598,377
2010	8,949,469	36,714,661	11,310,092	56,974,222
2011	8,561,328	45,224,539	3,557,125	57,342,992
2012	10,512,269	41,752,507	3,531,138	55,795,914
2013	8,663,680	24,738,942	5,725,526	39,128,148
2014	8,046,255	19,067,824	4,399,834	31,513,913
2015	6,144,469	21,199,484	7,898,242	35,242,195

Figure 10. Size composition of scallop landing (excluding unknown categories)

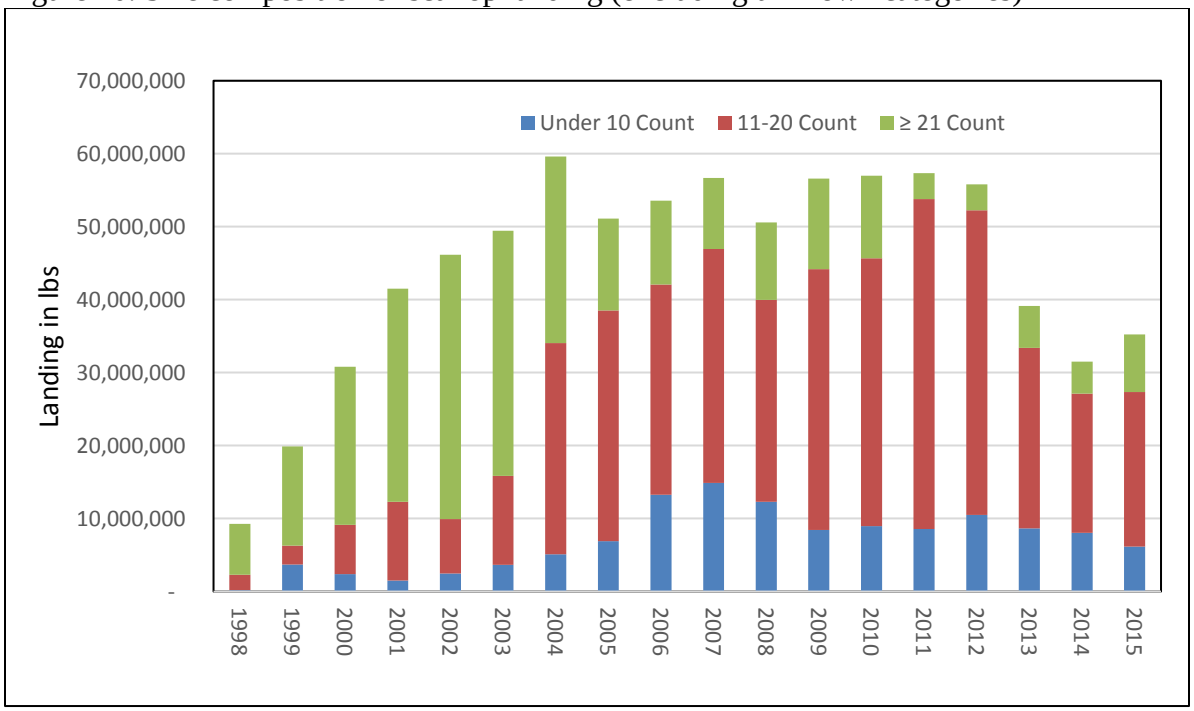


Table 4. Size composition of scallops (excluding unknown category)

Fish Year	UNDER 10 COUNT	11-20 COUNT	≥21 COUNT
1998	2.16%	22.65%	75.19%
1999	18.58%	13.16%	68.26%
2000	7.77%	21.98%	70.26%
2001	3.66%	25.99%	70.34%
2002	5.38%	16.12%	78.50%
2003	7.37%	24.71%	67.93%
2004	8.56%	48.53%	42.91%
2005	13.51%	61.83%	24.66%
2006	24.79%	53.78%	21.43%
2007	26.30%	56.50%	17.20%
2008	24.31%	54.73%	20.95%
2009	14.93%	63.11%	21.97%
2010	15.71%	64.44%	19.85%
2011	14.93%	78.87%	6.20%
2012	18.84%	74.83%	6.33%
2013	22.14%	63.23%	14.63%
2014	25.53%	60.51%	13.96%
2015	17.43%	60.15%	22.41%

Figure 11. Size composition of scallop landings in percent (excluding unknown categories)

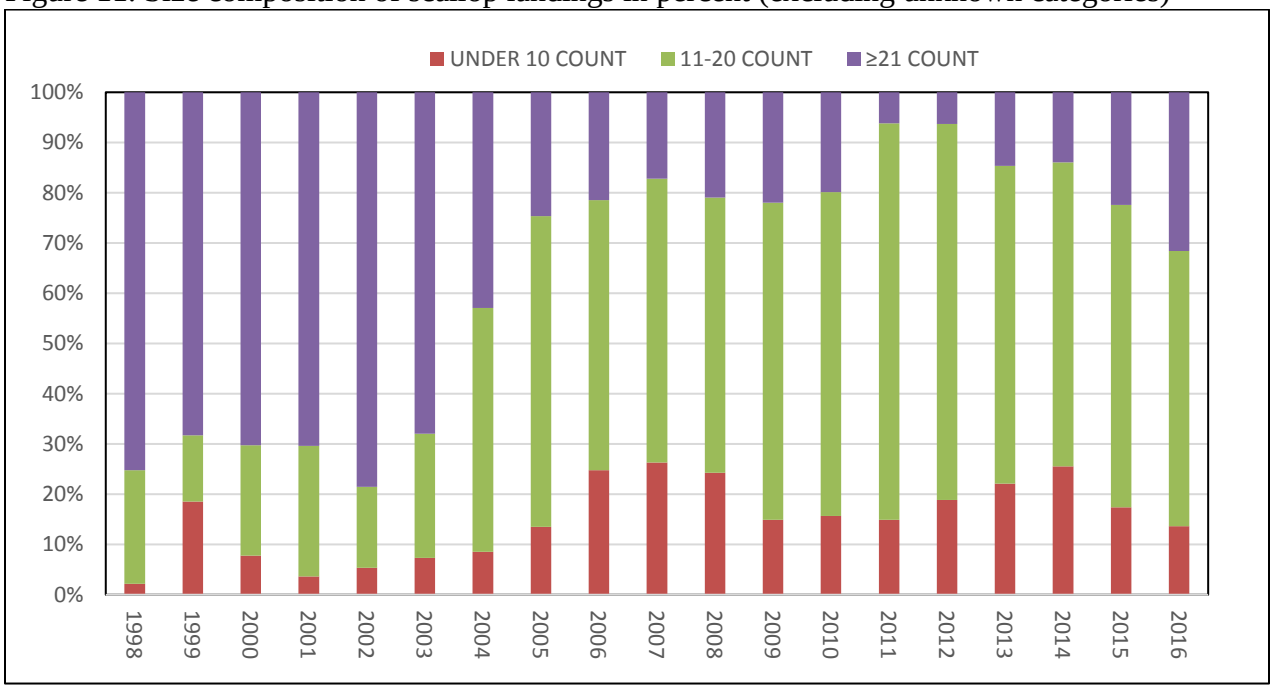


Table 5. Scallop revenue (in 2015 $) by market category for all permit classes (excluding unknown category

Fish Year	Under 10 count	11-20 Counts	≥ 21 Count	Grand Total
1999	31,242,514	22,508,769	100,633,123	154,384,406
2000	22,527,093	47,999,557	137,721,212	208,247,863
2001	11,961,372	53,993,564	137,196,882	203,151,817
2002	17,892,414	38,924,359	179,621,962	236,438,735
2003	22,863,676	64,095,963	177,510,109	264,469,748
2004	38,355,853	189,042,817	156,126,681	383,525,351
2005	66,155,029	297,601,065	116,784,342	480,540,436
2006	92,804,063	222,469,526	92,879,219	408,152,808
2007	117,056,147	240,893,598	69,355,967	427,305,713
2008	96,937,846	209,900,978	78,707,857	385,546,681
2009	74,848,876	244,321,469	83,737,841	402,908,186
2010	102,204,943	297,923,854	100,471,260	500,600,058
2011	91,924,251	470,972,706	38,531,433	601,428,389
2012	111,285,115	417,842,167	35,594,445	564,721,727
2013	108,525,696	283,697,294	66,620,101	458,843,090
2014	112,829,187	229,128,386	52,222,580	394,180,153
2015	92,401,217	250,631,527	88,973,728	432,006,471

Table 6. Composition of scallop revenue by size (excluding unknown category)

Fish Year	UNDER 10 COUNT	11-20 COUNT	≥21 COUNT
1999	20%	15%	65%
2000	11%	23%	66%
2001	6%	27%	68%
2002	8%	16%	76%
2003	9%	24%	67%
2004	10%	49%	41%
2005	14%	62%	24%
2006	23%	55%	23%
2007	27%	56%	16%
2008	25%	54%	20%
2009	19%	61%	21%
2010	20%	60%	20%
2011	15%	78%	6%
2012	20%	74%	6%
2013	24%	62%	15%
2014	29%	58%	13%
2015	21%	58%	21%

Figure 12. Revenue Composition by scallop sizes (excluding unknown category)

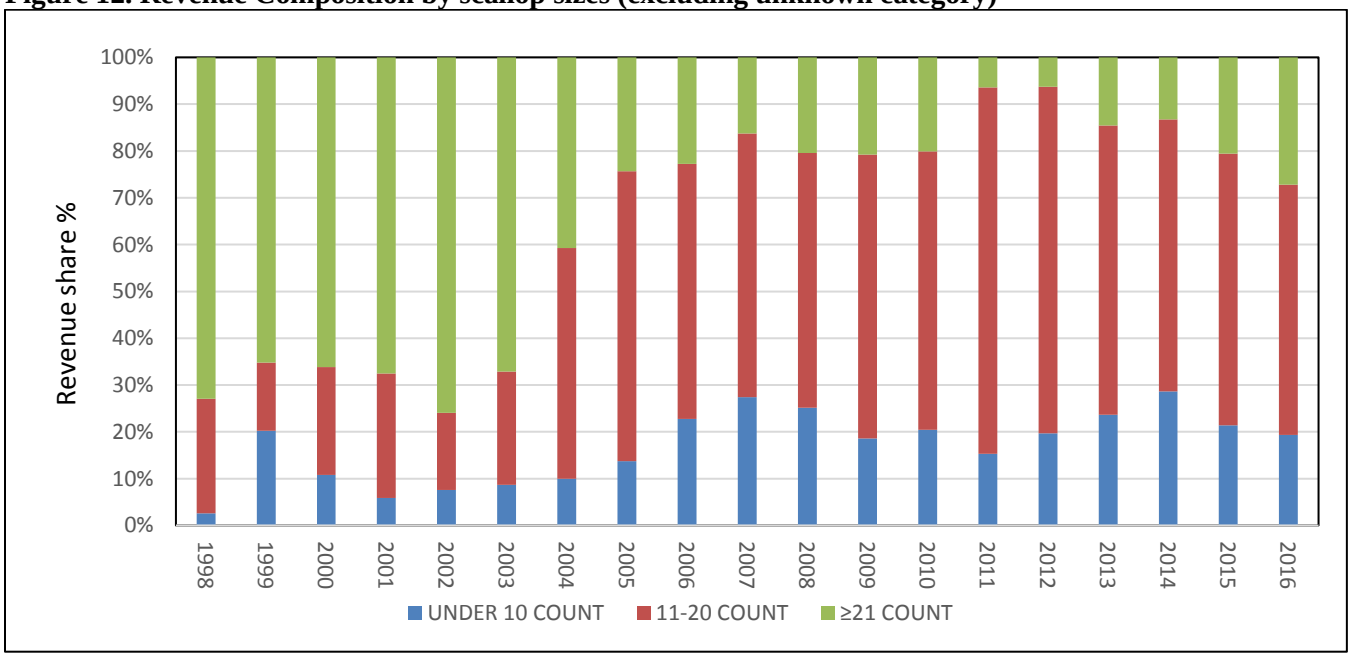
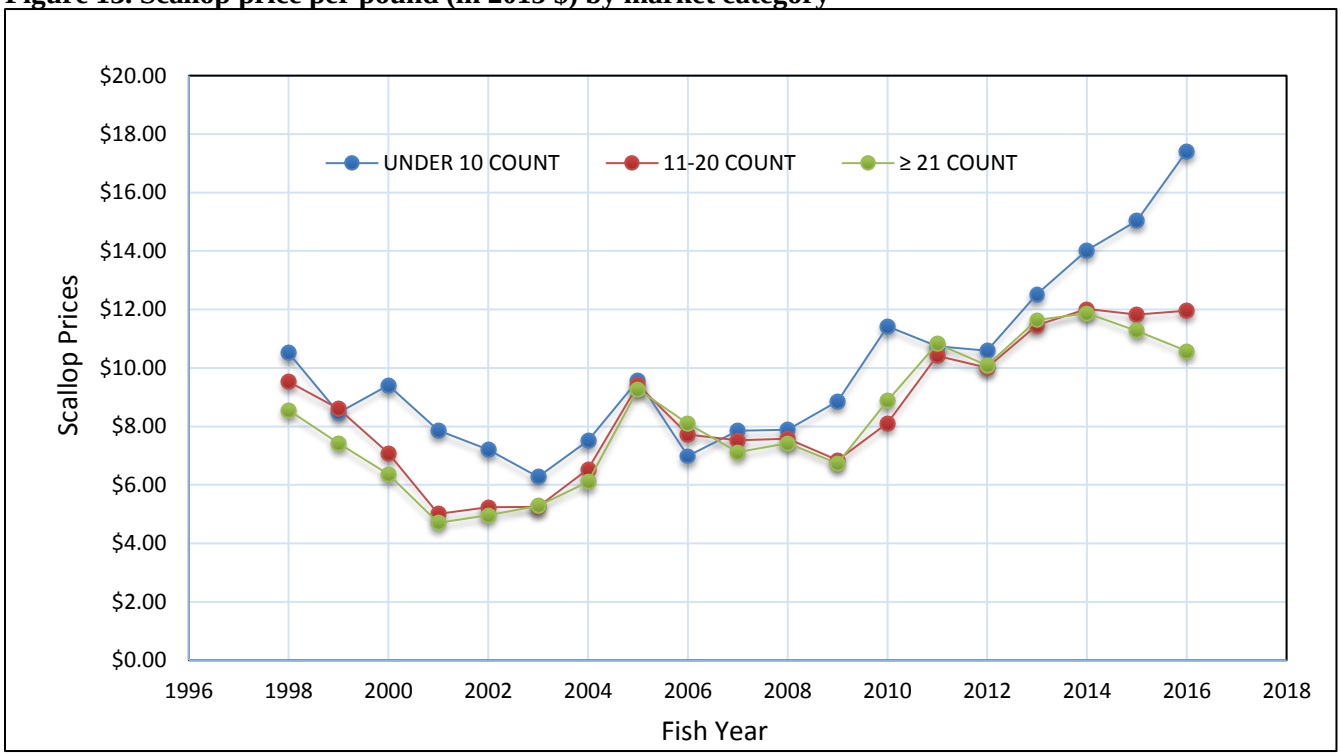


Table 7. Price of scallop per pound (in 2015 $) by market category

Fish Year	UNDER 10 COUNT	11-20 COUNT	≥ 21 COUNT	Average Price
1999	$8.47	$8.61	$7.42	$7.77
2000	$9.41	$7.09	$6.36	$6.76
2001	$7.87	$5.01	$4.70	$4.90
2002	$7.20	$5.23	$4.96	$5.12
2003	$6.27	$5.24	$5.28	$5.35
2004	$7.51	$6.53	$6.10	$6.43
2005	$9.58	$9.42	$9.26	$9.40
2006	$6.99	$7.72	$8.09	$7.62
2007	$7.85	$7.52	$7.12	$7.54
2008	$7.89	$7.58	$7.43	$7.62
2009	$8.86	$6.84	$6.73	$7.12
2010	$11.42	$8.11	$8.88	$8.79
2011	$10.74	$10.41	$10.83	$10.49
2012	$10.59	$10.01	$10.08	$10.12
2013	$12.53	$11.47	$11.64	$11.73
2014	$14.02	$12.02	$11.87	$12.51
2015	$15.04	$11.82	$11.27	$12.26

Figure 13. Scallop price per pound (in 2015 $) by market category



1.5.1 Trends in permits by permit plan and category

Table 8 shows the number of limited access vessels by permit category from 2009 to 2015. The fishery is primarily full-time, with a small number of part-time permits. There are no occasional permits left in the fishery since 2009 because these were converted to part-time small dredge. Of these permits, the majority is dredge vessels, with a small number of full-time small dredge and full-time trawl permit holders. The permit numbers shown in

Table 8 include duplicate entries because replacement vessels receive new permit numbers and when a vessel is sold, the new owner would get a new permit number. The unique vessels with right-id numbers are shown in Table 10 for 2008-2012. For example, only 347 out of 356 permits in 2008 belonged to unique vessels. The number of LAGC permits held by limited access vessels is shown in Table 9.

Table 8. Number of limited access vessels by permit category and gear

Vessel	2009	2010	2011	2012	2013	2014	2015
Full Time	245	251	250	252	250	250	249
Full-time Small Dredge	53	52	52	52	52	51	52
Full-time Trawl	11	11	11	11	11	11	11
Part-time	2	2	2	2	2	2	2
Part-Time Small Dredge	32	33	32	31	31	30	32
Grand Total	**343**	**349**	**347**	**348**	**346**	**344**	**346**

Table 9. LAGC permits held by limited access vessels by permit category

Fish Year	IFQ	NGOM	INCIDENTAL
2009	41	26	112
2010	40	28	114
2011	41	27	113
2012	39	27	114
2013	40	27	112
2014	40	27	112
2015	43	27	112

Table 10. Scallop Permits by unique right-id and category by application year

Permit category	2008	2009 to 2016
Full-time	250	250
Full-time small dredge	52	52
Full-time net boat	11	11
Total full-time	313	313
Part-time	2	2
Part-time small dredge	31	32
Part-time trawl	0	0
Total part-time	33	34
Occasional	1	0
Total Limited access	347	347

Table 11 shows that the number of general category permits, including permits held by LA vessels, declined considerably after 2007 as a result of the Amendment 11 provisions. Although not all vessels with general category permits were active in the years preceding 2008, there is no question that the number of vessels (and owners) that hold a limited access general category permit under the Amendment 11 regulations are less than the number of general category vessels that were active prior to 2008. The numbers of LAGC permits by category, excluding the LA vessels that also have an LAGC permit, are shown in Table 12. The number of permits includes the permits of the replacement vessels within a given year.

Table 11. General category and LAGC permits (including the LA vessels with LAGC permits)

AP_YEAR		Number of permits qualify under Amendment 11 program			Grand Total
	General category permit (up to 2008)	IFQ (include LA permits)(A)	NGOM permit (B)	Incidental catch permit (C)	
2000	2263				2263
2001	2378				2378
2002	2512				2512
2003	2574				2574
2004	2827				2827
2005	2950				2950
2006	2712				2712
2007	2493				2493
2008		342	99	277	718
2009		344	127	301	772
2010		333	122	285	740
2011		288	103	279	670
2012		290	110	280	680
2013		278	97	282	657
2014		260	103	260	623
2015*		242	90	242	574

*Preliminary numbers as of June 2015.

Table 12. LAGC permits after Amendment 11 implementation (excluding the LAGC permits held by LA)

Fish Year	IFQ	NGOM	Incidental	Grand Total
2008	270	77	166	513
2009	304	100	188	592
2010	293	94	172	559
2011	248	81	166	495
2012	237	70	163	470
2013	222	77	149	448
2014	220	76	144	440
2015	217	72	138	427
2016	205	61	128	394

The trends in the estimated number of active limited access vessels are shown in Table 13 by permit plan. Table 14 shows the number of active LAGC vessels by permit category excluding those LA vessels which have both LA and LAGC permits.

Table 13. Active vessels by fishing year (Vessels that landed any amount of scallops, Dealer Data)

Fish Year	FT	FT-NET	FT-SMD	OC	OC-NET	PT	PT-NET	PT-SMD
1994	228	30	5	4	28	26	30	9
1995	227	32	4	3	26	21	30	6
1996	215	28	5	2	25	19	27	8
1997	200	26	3	2	21	16	30	8
1998	203	23	2	3	19	11	27	6
1999	212	16	1	4	20	12	22	3
2000	219	17	3	4	16	16	20	4
2001	224	16	13	5	19	14	18	6
2002	230	16	25	4	15	14	10	8
2003	237	16	37	3	8	10	8	19
2004	239	14	47	3	5	4	3	23
2005	247	15	54	1	4	3		27
2006	257	12	57	1		2		33
2007	255	12	60	1		2		33
2008	253	11	55	1		2		31
2009	252	12	53			2		35
2010	252	11	52			2		33
2011	254	11	53			2		33
2012	257	11	53			2		33
2013	254	12	52			2		32
2014	253	12	52			2		32
2015	252	11	54			2		32
2016	253	11	52			2		32

Table 14. Number of active vessels with LAGC permits by permit category (Dealer data, excludes LA vessels with LAGC permits)

Fish Year	IFQ	NGOM	Incidental
2010	130	11	67
2011	122	8	51
2012	109	8	56
2013	108	12	66
2014	113	25	59
2015	119	24	58

1.6.1 Trends in landings by permit category, state and port, and gear type

1.7.1 Landings by permit category

Table 15 and
Table 16 describe scallop landings by limited access vessels by gear type and permit category. These tables were obtained by combining the dealer and permit databases.

Most limited access category effort is from vessels using scallop dredges, including small dredges.

The number of full-time trawl permits has decreased continuously and has been at 11 full-time trawl permitted vessels since 2008 (Table 13). Furthermore, according to the 2009-2011 VTR data, the majority of these vessels (10 out of 11 in 2010) landed scallops using dredge gear even though they had a trawl permit. There has also been an increase in the numbers of full-time and part-time small dredge vessels after 2001.

Table 16 shows the percent of limited access landings by permit and year. In terms of gear, majority of the scallop landings by the limited access vessels were with dredge gear including the small dredges, with significant amounts also landed by full-time and part-time trawls.

Table 16 shows that the percentage of landings by FT trawl permits has remained around 3% of total limited access scallop landings in recent years. There were only 11 FT trawl permits in 2015. However, 2009-2013 VTR data showed that over 90% of the scallop pounds by the FT trawl permitted vessels are landed using dredge gear (10 vessels) since these vessels are allowed to use dredge gear even though they have a trawl permit. Similarly, all of the part-time trawl and occasional trawl permits are converted to small dredge vessels. Over 82% of the scallop pounds are landed by vessels with full-time dredge and 12% landed by vessels with full-time small dredge permits in 2015 fishing year. Including the full-trawl vessels that use dredge gear, the percentage of scallop pounds landed by dredge gear amounted to over 99% of the total scallop landings in 2009-2015.

Table 15. Scallop landings (lb..) by limited access vessels by permit category

Fish Year	Full Time	Full-time Small Dredge	Full-time Trawl	Part-time	Part-Time Small Dredge	Total Landings (lb.)
2009	40,043,596	6,829,668	1,814,830	207,592	1,456,402	50,352,088
2010	40,881,780	6,555,975	1,778,977	238,648	2,034,978	51,490,358
2011	42,673,069	7,035,511	1,912,699	211,192	1,681,875	53,514,346
2012	41,627,828	6,898,928	1,739,056	210,565	1,421,729	51,898,106
2013	29,739,370	3,850,334	1,224,659	154,673	902,638	35,871,674
2014	24,688,140	3,105,361	868,750	106,622	681,743	29,450,616
2015	27,039,788	4,101,548	933,717	140,919	924,108	33,140,080

Table 16. Percentage of scallop landings (lb..) by limited access vessels by permit category

Fish Year	Full Time	Full-time Small Dredge	Full-time Trawl	Part-time	Part-Time Small Dredge
2009	79.53%	13.56%	3.60%	0.41%	2.89%
2010	79.40%	12.73%	3.45%	0.46%	3.95%
2011	79.74%	13.15%	3.57%	0.39%	3.14%
2012	80.21%	13.29%	3.35%	0.41%	2.74%
2013	82.90%	10.73%	3.41%	0.43%	2.52%
2014	83.83%	10.54%	2.95%	0.36%	2.31%
2015	81.59%	12.38%	2.82%	0.43%	2.79%

Since 2001, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices. Amendment 11 implemented a limited entry program for the general category fishery allocating 5% of the total projected scallop catch to the general category vessels qualified for limited access. The main objective of the action was to control capacity and mortality in the general category scallop fishery. There is also a separate limited entry program for general category fishing in the Northern Gulf of Maine. In addition, a separate limited entry incidental catch permit was adopted that will permit vessels to land and sell up to 40 pounds of scallop meat per trip while fishing for other species.

During the transition period to the full-implementation of Amendment 11, the general category vessels were allocated 10% of the scallop TAC. Beginning with 2010 fishing year, limited access general category IFQ vessels were allocated 5% of the estimated scallop catch resulting a decline in landings by the general category vessels (Table 17 and Table 18). These tables were obtained from the dealer and permit databases. The trip information obtained from the dealer data shows the permit number but does not specify whether a particular

trip was taken as a limited access (LA) or general category (LAGC) trip. Because many vessels had and have both LA and general category permits, to separate the LA trips from LAGC trips for the same vessel requires some assumptions. If a vessel had both an LA and LAGC-IFQ permit, it was assumed that if scallop landings were equal or less than 400 lb. (600 lb.) for years up to 2010 (after 2010), that was an LAGC trip. If an LA vessel also had an LAGC-incidental permit, it was assumed that if scallop landings were equal or less than 100 lb. that was an LAGC-incidental trip. For the LAGC-NGOM fishery it was assumed that if the scallop landings were equal or less than 200 lb., that trip was a LAGC trip, otherwise it was an LA trip. In addition to these issues, there were many trips that were not associated with any valid permit plan (perhaps due to mistakes in the entry of permit number by dealers). Thus, it must be pointed out that the separation of landings by permit plan were estimated from the above assumptions and could differ slightly from actual landings. For example,
Table 18 shows that in 2015 fishing year, the landings by LAGC vessels including those by vessels with IFQ, NGOM and incidental catch permits and including the LAGC landings by the LA vessels that have both permits, amounted to about 7% of total scallop landings in that fishing year.

Table 17. Landing by permit plan after Amendment 11 implementation

Fish Year	LA	LAGC	NA
2009	50,352,088	3,801,176	374,956
2010	51,490,358	2,115,727	**
2011	53,514,346	2,906,129	**
2012	51,898,106	2,805,775	**
2013	35,871,674	2,298,349	**
2014	29,450,616	2,199,824	**
2015	33,140,080	2,446,373	321,250

** Landings by less than 3 vessels

Table 18. Landing by permit plan (dealer data)

Fish Year	LA	LAGC*	NA
2009	92.34%	6.97%	0.69%
2010	96.05%	3.95%	**
2011	94.85%	5.15%	**
2012	94.87%	5.13%	**
2013	93.97%	6.02%	**
2014	93.05%	6.95%	**
2015	92.29%	6.81%	0.89%

*Includes landings by LAGC IFQ, NGOM and incidental permits; ** Landings by less than 3 vessels

1.8.1 Number of permit and landings by state and port.

The general category scallop fishery has always been a comparatively small but diverse part of the overall scallop fishery. The number of vessels participating in the general category fishery has continued to rise until 2007 when the New England Fisheries Management Council proposed limiting access in response to concerns of redirected effort from other fisheries. When the limited access general category was implemented, in 2008, there was a corresponding decline in the total number of active vessels. Then again in 2010, there was a decline in the number of active general category vessels when the GC IFQ program began and a "hard" Total Allowable Catch of 5% of the total scallop catch limit was established.

The Scallop PDT generally describes changes in the scallop fishery at the community level based on both port of landing, and home port state. A port of landing is the actual port where fish and shellfish have been landed, where a home port is the port identified by a vessel owner on a vessel permit application and is where supplies are purchased and crew is hired. Statistics based on port of landing begin to describe the benefits that other fishing related businesses (such as dealers and processors) derive from the landings made in their port. Alternatively, statistics based on homeport give an indication of the benefits received by vessel owners and crew from that port. However, during this analysis the PDT observed that many vessels declare a primary port for the year and it does not always match up with the actual port the vessel landed the majority of scallop catches for the year. Therefore, these results should take that into consideration.

In terms of home state, the majority of the limited access vessels are from MA, followed by NJ, VA and NC (Table 19). The same is true in terms of primary state of landing. There has been not much year to change in the number of vessels both by the home port state and port of landing.

Table 19. Number of limited access permits by home state (Permit data)

HPST	2009	2010	2011	2012	2013	2014	2015	2016
CT	10	10	10	10	9	9	9	10
FL	4	4	4	4	3	3	3	3
MA	148	147	152	153	151	150	145	150
ME	3	3	3	3	3	3	3	3
NC	42	38	39	40	40	40	41	41
NJ	92	92	95	94	95	95	88	94
NY	3	3	2	2	2			
PA	5	4	3	3	3	3	3	3
RI	3	3	2	2	2	2	2	2
VA	44	46	43	45	44	46	49	48
Grand Total	354	350	353	356	352	351	343	354

The largest numbers of permitted limited access scallop vessels have home ports of New Bedford, MA and Cape May, NJ, which represent 39% and 21% of all limited access vessels respectively (Table 20 and Table 21). So, these two ports alone accommodates about 60% of all limited access vessels. The number of vessels homeported in some ports on the periphery of scallop fishing grounds has declined over time. Many ports have remained relatively stable in terms of LA vessels, but in ports like Norfolk, VA or Boston, MA the number of LA vessels

homeported in those areas has decreased between 2001 and 2015 (Table 20 and Table 21). On the other hand, some southern ports like New Bern, NC, Beaufort, NC and Seaford, VA have seen increases in the number of LA vessels homeported in those areas. Several southern ports have remained constant such as Wanchese, NC, Lowland NC, and Hampton, VA. Highlighting the difference between port of landing and home port however, are ports like New Bern, NC and Wanchese, NC, both of which are the home ports of a number of vessels with scallop landings but where no (or very little) landings were made. It should also be noted that some scallop companies have merged over time, and while a vessel may still be homeported in one state, it may actually be owned by a company from another state, and product landed in that state compared to the homeport of the vessel. These nuances cannot easily be tracked.

Table 20. Number of permitted limited access scallop vessels. By homeport, 2001-2008

State	Homeport	2001	2002	2003	2004	2005	2006	2007	2008
MA	NEW BEDFORD	90	97	102	111	125	131	133	132
NJ	CAPE MAY	36	42	50	54	68	71	73	68
VA	NEWPORT NEWS	21	21	21	22	23	19	19	18
VA	SEAFORD	2	3	4	4	5	5	5	5
NC	NEW BERN	8	8	8	8	13	12	14	11
NJ	BARNEGAT LIGHT	9	8	8	10	11	10	10	10
NC	WANCHESE	8	7	7	6	6	8	8	8
NC	LOWLAND	7	7	8	9	8	8	8	7
NJ	POINT PLEASANT	3	3	3	4	3	3	3	6
VA	HAMPTON	6	6	6	7	4	8	6	6
CT	NEW LONDON	1	1	1	1	3	5	5	5
MA	BOSTON	12	11	10	7	7	7	7	6
MA	FAIRHAVEN	10	8	8	7	8	7	5	4
NC	BEAUFORT							1	2
VA	NORFOLK	27	27	27	22	13	11	11	11
CT	STONINGTON	4	6	7	7	4	4	5	4
PA	PHILADELPHIA	5	5	6	6	5	5	5	5
RI	POINT JUDITH	1	1	2	1	2	3	3	3

Table 21. Number of permitted limited access scallop vessels. By homeport, 2009-2015

HPST	HPORT	2009	2010	2011	2012	2013	2014	2015	2016
CT	ESSEX	1	1	1	1	1	1		
	NEW LONDON	5	5	5	5	4	4	4	4
	STONINGTON	4	4	4	4	4	4	5	6
FL	CAPE CANAVERAL	2	2	2	2	2	2	2	2
	JACKSONVILLE	1	1	1	1				
	KEY WEST	1	1	1	1	1	1	1	1
MA	BOSTON	5	6	5	4	4	5	5	5
	CHATHAM				1	1			
	FAIRHAVEN	4	4	5	6	7	7	7	6
	HYANNIS	1	1	1	1	1	1	1	1
	MANOMET	1	1	1	1	1	1		1
	NEW BEDFORD	**136**	**134**	**139**	**139**	**136**	**135**	**131**	**136**
	WESTPORT POINT	1	1	1	1	1	1	1	1
ME	BASS HARBOR	1	1	1	1	1	1	1	1
	OWLS HEAD	1	1	1	1	1	1	1	1
	SOUTHWEST HARBOR	1	1	1	1	1	1	1	1
NC	AURORA		1	1	3	3	4	4	4
	BAYBORO	2	2	2	2	2	2	2	2
	BEAUFORT	5	4	5	6	5	5	6	5
	LOWLAND	7	7	7	7	7	6	6	6
	NEW BERN	12	11	11	10	11	11	11	11
	NEWPORT	1	1	1	1	1	1	1	2
	ORIENTAL	4	1	1					
	SWAN QUARTER	3	3	3	3	3	3	3	3
	WANCHESE	8	8	8	8	8	8	8	8
NJ	ATLANTIC CITY	3	3	1	1	1		1	5
	BARNEGAT LIGHT	10	10	10	10	10	10	10	10
	CAPE MAY	**67**	**67**	**72**	**75**	**76**	**77**	**69**	**71**
	MANAHAWKIN	1	1	1	1	1	1	1	1
	OCEAN CITY	1	1	1					
	POINT PLEASANT	7	8	6	4	4	4	3	3
	POINT PLEASANT BEACH	1	1	3	2	2	2	3	3
	WEST CREEK	1							
	WILDWOOD	1	1	1	1	1	1	1	1
NY	MONTAUK	3	3	2	2	2			
PA	PHILADELPHIA	5	4	3	3	3	3	3	3
RI	POINT JUDITH	3	3	2	2	2	2	2	2
VA	CARROLLTON	2	2	2	2	2	2		
	HAMPTON	6	5	5	6	6	7	6	6
	NEWPORT NEWS	17	18	17	17	17	17	24	24
	NORFOLK	11	12	5	4	4	4	3	2
	POQUOSON	1	1	1	1	1	1	1	1
	SEAFORD	6	7	12	14	13	14	14	14
	SUFFOLK	1	1	1	1	1	1	1	1

In terms homeport state, most LA landings were from vessels with homeports in MA, followed by NJ, then VA and NC (Table 23). The results are very similar when summarized by the primary port identified by the vessel, with some important differences.

Table 22. Number of limited access permits by primary state (Permit data)

PPST	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
CT	10	10	10	10	9	9	9	10
MA	149	148	153	154	152	153	148	152
ME	3	3	3	3	3	3	3	3
NC	26	24	24	25	26	26	29	29
NJ	97	94	97	97	97	94	90	97
NY	2	3	2	2	2			
PA	1	1	1	1	1	1	1	1
RI	3	3	2	2	2	2	2	2
VA	63	64	61	62	60	63	61	60
Grand Total	**354**	**350**	**353**	**356**	**352**	**351**	**343**	**354**

Table 23. Scallop landings (lb.) by home state of landing for limited access vessels (excluding LAGC trips)

Home State	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
CT	193,634	156,719	126,083	165,486	96,563	71,962	167,694
FL	32,837						
MA	14,903,610	14,635,035	15,575,788	15,379,835	10,990,722	8,568,246	9,636,641
ME	97,680	47,658	64,650	79,165	64,926	75,685	114,661
NC	4,069,885	3,414,892	3,933,431	3,567,329	2,348,377	1,916,617	2,270,888
NJ	8,987,736	8,753,670	9,469,410	8,692,413	6,418,755	5,615,567	6,156,091
NY	821,693	467,727	486,565	366,804	273,936	195,206	150,969
PA	545,122	572,927	410,318	387,404	260,489	238,155	225,307
RI	171,506	377,708	415,861	454,504	295,385	277,343	254,338
VA	344,645	433,010	503,517	410,426	112,329	217,031	503,608
NH	32,683	11,578	10,803	11,111	28,578	25,685	24,026
MD	219,462	64,372	53,684	49,898	23,880	43,770	46,775
GA	33,240	8,508					
DE	4,494	9,539	4,955	7,222	545	822	8,255
TX				15,464	10,688	12,658	15,144
HST not specified	24,069,993	24,653,540	25,366,217	25,116,968	17,246,718	14,391,767	16,333,306
Grand Total	**54,528,220**	**53,606,883**	**56,421,282**	**54,704,029**	**38,171,891**	**31,650,514**	**35,907,703**

Table 24. Scallop landings (lb.) by primary state of landing for limited access vessels

Primary State	2009	2010	2011	2012	2013	2014	2015
CT	193,634	156,719	126,083	165,486	96,563	71,962	167,694
MA	15,031,813	14,724,926	15,687,781	15,488,128	11,098,320	8,661,856	9,779,699
ME	89,390	37,319	64,650	74,695	59,963	71,646	110,661
NC	2,822,062	2,313,545	2,626,142	2,498,653	1,553,112	1,223,184	1,713,593
NJ	9,493,584	9,087,976	9,757,240	9,096,664	6,566,485	5,862,924	6,369,006
NY	658,075	467,727	486,565	366,804	273,936	195,206	149,684
PA	166,172	166,868	195,935	147,320	128,569	84,428	93,054
RI	179,796	387,880	415,861	454,504	295,385	277,343	254,275
VA	1,466,230	1,479,681	1,617,334	1,220,155	802,724	741,556	849,525
NH	32,683	7,594	5,845	7,036	25,602	23,834	24,684
MD	229,462	85,005	71,629	67,616	24,514	44,808	62,522
FL	62,086	29,595					
GA	33,240	8,508					
PST not specified	24,069,993	24,653,540	25,366,217	25,116,968	17,246,718	14,391,767	16,333,306
Grand Total	54,528,220	53,606,883	56,421,282	54,704,029	38,171,891	31,650,514	35,907,703

LAGC IFQ vessels are distributed up and down the coast as well. The number of LAGC IFQ trips for these vessels have been summarized by both homeport state and primary port state as identified by the permit owner (Table 25 and Table 26). There are some differences, but overall the number of permits were similar. The vessels homeported in MA and NJ landed the major proportion of scallops since 2009 (

Table 27).

Table 25. Number of LAGC-IFQ permits by home state (exclude LA vessels, Permit Data)

HPST	2009	2010	2011	2012	2013	2014	2015	2016
CT	6	5	2	4	4	4	4	5
DE	3	3	3	3	3	4	4	4
FL	2							
GA	1	1						
MA	115	111	99	93	89	93	92	90
MD	11	10	9	8	7	4	4	4
ME	22	16	12	11	8	8	6	5
NC	45	46	36	34	31	28	26	27
NH	10	7	6	6	5	4	3	3
NJ	95	100	89	83	82	81	85	82
NY	21	17	17	18	17	18	21	19
PA	3	3	3	3	3	3	3	3
RI	5	6	7	7	6	6	7	8
TX				1	1	1	1	1
VA	8	8	7	7	7	6	7	7

Table 26. Number of LAGC-IFQ permits by primary state (excludes LA vessels, Permit data)

PPST	2009	2010	2011	2012	2013	2014	2015	2016
CT	5	4	1	3	3	3	3	5
DE	1	1	1	1	1	1	1	1
FL	3	1	1					
GA	1	1						
MA	113	109	97	90	85	89	89	86
MD	14	13	12	11	10	8	8	8
ME	20	14	11	11	8	8	6	5
NC	36	39	29	30	26	24	21	21
NH	9	6	5	5	4	3	2	2
NJ	70	75	62	56	57	56	59	56
NY	20	17	17	18	17	18	21	18
RI	6	7	7	7	6	6	7	8
VA	6	6	5	5	5	4	4	4

Table 27. Scallop landings (lb.) by home state for LAGC-IFQ vessels (excluding IFQ trips by LA vessels, dealer and permit data)

Home State	2009	2010	2011	2012	2013	2014	2015
CT	47,927	10,330	6,644	44,416	38,359	23,278	52,589
FL	32,837						
MA	711,330	624,260	908,933	1,097,567	878,853	645,144	833,668
ME	97,326	46,399	64,539	74,619	37,941	54,701	70,966
NC	548,067	291,758	302,810	162,007	166,514	147,963	147,511
NJ	1,504,782	805,200	1,228,816	966,735	813,862	970,214	951,818
NY	303,663	175,625	231,451	239,346	201,480	140,241	148,762
RI	36,251	28,584	43,936	72,076	54,657	46,286	49,464
VA	86,027	36,248	49,447	49,747	12,989	7,560	8,385
NH	32,628	11,484	10,171	9,032	8,948	5,890	3,342
MD	219,462	64,372	53,684	49,898	23,880	43,770	46,775
GA	33,240	8,508					
DE	4,494	9,539	4,955	7,222	545	822	8,255
TX				15,464	10,688	12,658	15,144

Table 28. New Scallop landings (lb.) by primary state for LAGC-IFQ vessels (excluding IFQ trips by LA vessels, dealer and permit data)

Primary State	2009	2010	2011	2012	2013	2014	2015
CT	47,927	10,330	6,644	44,416	38,359	23,278	52,589
FL	62,086	29,595					
GA	33,240	8,508					
MA	711,330	628,411	913,891	1,106,112	886,792	651,034	837,010
MD	229,462	85,005	71,629	67,616	24,514	44,808	62,522
ME	89,036	36,227	64,539	74,619	37,941	54,701	70,966
NC	477,577	257,164	296,033	171,675	169,872	145,579	156,482
NH	32,628	7,333	5,213	487	1,009		
NJ	1,524,942	804,792	1,228,816	966,735	813,862	970,214	951,818
NY	303,663	175,625	231,451	239,346	201,480	140,241	148,762
RI	44,541	38,756	43,936	72,076	54,657	46,286	49,464
VA	101,602	30,561	43,234	45,047	20,230	22,386	7,066
Total-IFQ only	**3,658,034**	**2,112,307**	**2,905,386**	**2,788,129**	**2,248,716**	**2,098,527**	**2,336,679**

1.9.1 Trip and Fixed Costs for scallop vessels

1.9.10 Trip Costs

Data for variable costs, i.e., trip expenses include food, fuel, oil, ice, water and supplies and obtained from observer cost data for 2000-2015. Since 2000s, the share of fuel has remained

about 65% of the total trip cost at an average fuel cost of about $1,576 per day at sea over the past 15 years for the full time dredge vessels (Table 30). Average trip costs for full-time small dredge vessels were about $1,423 per day-at-sea in 2015 (Table 32).

Table 29. Observer data information for the full-time dredge vessels

fishing year	No. of Trips	Scallop lb. per trip	Average DAS fished	Aveage LPUE (lb/DAS all areas)	Average of crew per trip
2001	19	18,493	11.21	1,650	7.00
2002	39	17,228	10.33	1,667	6.90
2003	31	18,718	11.06	1,692	6.94
2004	78	18,070	9.49	1,905	6.77
2005	55	16,828	9.71	1,733	6.65
2006	50	12,113	7.94	1,526	6.52
2007	108	14,839	8.46	1,753	6.51
2008	203	10,532	6.33	1,665	5.12
2009	147	12,612	7.27	1,736	5.49
2010	111	14,058	8.20	1,715	5.99
2011	104	17,168	7.80	2,202	5.92
2012	121	18,053	8.88	2,034	6.53
2013	140	11,716	6.51	1,801	5.43
2014	147	9,800	6.49	1,510	5.27
2015	161	9,510	6.16	1,543	5.58
Average	101	14,649	8.39	1,742	6.17

Table 30. Fuel and total trip costs for FT dredge vessels (in 2015 inflation adjusted prices)

fishing year	Avg. fuel price	Avg. fuel cost/DAS	Avg. trip costs/DAS*	Avg. trip cost/trip*	Avg. fuel cost/trip	Fuel cost as % of total trip costs
2001	2.09	957	2,056	21,328	10,603	49.71
2002	2.22	1,025	1,634	16,304	10,806	66.28
2003	1.87	840	1,257	14,542	9,844	67.70
2004	1.98	901	1,359	13,113	8,859	67.56
2005	1.93	846	1,284	12,349	8,330	67.45
2006	1.82	870	1,522	12,030	7,245	60.22
2007	1.86	852	1,448	12,646	7,726	61.09
2008	2.06	896	1,309	12,238	8,545	69.82
2009	2.06	927	1,339	13,467	9,488	70.46
2010	1.97	949	1,492	14,645	9,718	66.36
2011	2.05	1,002	1,537	15,183	10,072	66.33
2012	2.05	1,062	1,885	17,386	10,203	58.69
2013	2.05	1,116	1,727	15,952	10,327	64.73
2014	2.13	1,202	1,807	17,015	11,699	68.76
2015	2.56	1,317	2,004	17,063	11,397	66.79
Average	**2.06**	**1,001**	**1,576**	**14,790**	**9,659**	**65.31**

*Includes fuel, supply and damage costs

Table 31. Observer data information for the full-time small dredge vessels

fishing year	No. of Trips	Average DAS	Scallop lb. per trip	Average crew per trip	Average LPUE (lb./das)
2005	5	10.20	17,080	5.00	1,711
2006	10	8.50	9,460	5.60	972
2007	16	8.75	11,432	5.56	1,276
2008	27	8.22	14,044	5.04	1,542
2009	17	9.94	15,704	5.18	1,419
2010	9	8.78	11,225	5.22	1,177
2011	13	8.85	15,727	5.31	1,645
2012	14	9.50	14,428	5.21	1,420
2013	15	8.07	9,588	5.20	1,115
2014	16	7.56	7,532	4.88	882
2015	18	7.44	10,843	5.33	1,439
Average	**14.55**	**8.71**	**12,460**	**5.23**	**1327**

Table 32. Fuel and total trip costs for full-time small dredge vessels (in 2015 inflation adjusted prices)

fishing year	Avg. fuel price	Avg. fuel cost/DAS	Avg. trip costs/DAS*	Avg. total trip costs/trip*	Avg. fuel costs/trip
2005	2.01	721	1,067	11,707	8,094
2006	1.83	605	1,151	8,709	5,125
2007	1.97	609	1,036	9,213	5,610
2008	2.02	566	1,021	8,583	4,875
2009	1.97	537	846	8,710	5,438
2010	1.99	664	994	9,037	6,137
2011	2.08	603	986	9,343	5,712
2012	1.98	572	941	8,889	5,500
2013	2.15	650	1,093	9,187	5,328
2014	2.18	747	1,154	9,459	6,031
2015	2.85	912	1,423	10,797	7,104
Average	**2.09**	**653**	**1,065**	**9,421**	**5,905**

*Includes fuel, supply and damage costs

Table 33. Observer data information for LAGC IFQ vessels

fishing year	No. of trips	Scallop lb. per trip	Average DAS fished	Average LPUE (lb./DAS all areas)	Average crew per trip
2008	67	1,052.79	2.12	516	3.16
2009	44	965.64	2.20	450	3.20
2010	18	444.67	1.33	357	3.17
2011	20	544.20	1.35	427	2.80
2012	8	693.38	1.00	693	3.63
2013	40	599.50	1.68	380	3.13
2014	45	863.49	2.09	379	3.16
2015	40	587.15	1.78	366	3.13
Average	**35.25**	**718.85**	**1.69**	**446**	**3.17**

Table 34. Fuel and total trip costs for LAGC IFQ vessels (in 2015 inflation adjusted prices)

fishing year	Av. Fuel Price $/gal	Avg. Fuel costs/DAS	Avg. trip costs/DAS*	Avg. total trip costs/trip*	Avg. fuel costs/trip
2008	$2.38	$203	$311	$634	$413
2009	1.88	231	354	780	509
2010	1.94	234	329	407	294
2011	2.14	169	241	329	231
2012	2.12	240	346	346	240
2013	2.06	203	296	504	340
2014	2.09	239	492	1,105	578
2015	2.59	394	511	880	669
Avg.	2.15	239	360	623	409

*Includes fuel, supply an damage cost

1.9.11 Fixed Costs

The fixed costs include those expenses that are not usually related to the level of fishing activity or output. These are insurance, maintenance, license, repairs, office expenses, professional fees, dues, taxes, utility, interest, communication costs, association fees and dock expenses. According to the observer data on fixed costs for the period 2001 to 2007, the fixed costs including maintenance, repairs, engine and gear replacement and hull and liability insurance averaged $191,167 (in 2011 prices) per full-time vessel included in the sample (See Appendix I to Framework 26, Economic Model, Section 1.1.3, Tables 5 to 9).

Table 35 provides updated numbers for the fixed costs for years 2011 and 2012 using the NMFS 2011 and 2012 Cost Surveys. Average fixed costs with and without upgrade costs are much higher in 2011 compared to 2012. However, this is probably because the sample of scallop vessels included each year are different with larger vessels included in 2011. Interestingly, average fixed costs (excluding the upgrade costs) per limited access vessel in 2012 ($212,336) were just slightly higher than average fixed costs estimates for 2001-2007. The 2011-2012

survey data will be combined with the observer and survey data from earlier years to estimate fixed costs functions to simulate those expenses for the limited access fleet.

Table 35 - Fixed costs per vessel by permit category (in current prices)

YEAR	Values	FT	PT	LAGC	Grand Total
2011	Number of vessels	14	4	7	25
	Fixed costs per vessel	329,665	164,371	54,477	226,165
	Fixed costs including upgrade	404,297	201,245	74,427	279,445
	Average HP per vessel	984	478	334	721
	Average length per vessel	87	79	53	76
	Average vessel value	4,215,708	1,750,000	732,143	2,788,717
	Average scallop revenue	1,795,677	527,400	168,911	1,137,258
	% of revenue from scallops	92%	71%	47%	76%
2012	Number of vessels	9		3	12
	Fixed costs per vessel	212,336		66,145	175,789
	Fixed costs including upgrade	287,377		81,178	235,827
	Average HP per vessel	840		487	751
	Average length per vessel	83		50	75
	Average vessel value	3,544,444		383,333	2,754,167
	Average scallop revenue	1,517,900		111,910	1,166,403
	% of revenue from scallops	87%		48%	77%

Main fixed costs items consisted of repairs and maintenance, insurance, interest payments and vessel upgrade (
Table 36). It seems repairs and maintenance was quite high in 2011 for the vessels included in the survey which may explain why overall costs were higher in this year. In addition, scallop revenues peaked in 2011 to a total of more than $600 million for the fleet possibly providing more funds and incentive for many vessel owners to invest in repair expenses.

Table 36. Composition of fixed costs per vessel by permit category (in current prices)

YEAR	Values	FT	PT	LAGC
2011	Number of vessels	14	4	7
	Insurance	82,659	29,843	10,023
	Interest payments	77,148	1,000	7,310
	Repairs and maintenance	127,436	81,157	15,426
	Communications costs	3,678	2,741	2,210
	Haul costs	5,025	15,012	3,914
	Moor	6,708	2,400	2,186
	Shop expenses	9,440	3,500	1,900
	Travel expenses	10,140	1,140	2,288
	Association fees	5,335	2,607	2,300
	Vessel upgrade	74,632	36,874	19,950
2012	Number of vessels	9		3
	Insurance	55,077		8,500
	Interest payments	14,799		5,567
	Repairs and maintenance	65,833		18,467
	Communications costs	3,787		1,687
	Haul costs	6,017		900
	Moor	8,217		2,475
	Shop expenses	12,222		10,683
	Travel expenses	3,063		800
	Association fees	9,147		583
	Vessel upgrade	75,040		15,033

1.10.1 Trends in Foreign Trade of Scallop

Figure 14 shows scallop imports, exports, and re-exports in pounds including fresh, frozen and processed scallops. Although those numbers possibly include exports of bay, calico or weathervane scallops, it mainly consists of sea scallops. One of most significant change in the trend for foreign trade for scallops after 1998 was the striking increase in scallop exports. The increase in landings scallops led to a tripling of U.S. exports of scallops from about 11 million pounds in 1998 fishing year to a record amount of 34 million pounds in 2011 fishing year. During the same period, export prices increased as well as scallop landings continued to include a higher proportion of larger sized scallops (Figure 15). Total exports declined 19 million lb. in 2015 as the landings declined by about 36% in the same year compared to the levels in 2011.

In contrast, imports of scallops declined to 42 million lb. in 2011 from about 60 million lb. in 2010, that is, by almost 30% (

Figure 14). Because of the increase in the value of scallop exports (in 2015 dollar) to over $216 million and of re-exports to $20 million in 2011, and the decline in the value of imports to $269 million, the scallop trade deficit (the difference in the value of exported and imported scallops) reached to its lowest level, $32 million, since 1994 (
Figure 17). Therefore, rebuilding of scallops as a result of the management of the scallop fishery benefited the nation by reducing the scallop trade deficit in addition to increasing the revenue for the scallop fishery as a whole.

However, this trend was sharply reversed in the 2015 fishing year as the value of imports jumped to about $350 million and the value of exports declined to about $116 million. As a result, scallop deficit increased drastically to about $205 million in 2015. U.S. scallops have been primarily exported to Western Europe and Canada. Western Europe has been a biggest market for the U.S. scallop since 2004. The export to Western Europe and Canada has received better prices than the export to other countries (Figure 18).

Although there has been a significant increase in scallop landings since early 2000s, a large portion of the U.S. consumption of scallop is from imports has been primarily from China, Japan, and Canada (

Figure 19). Imports make significant proportion of U.S. scallop consumption volume. U.S. has been paying premium prices for imports from Japan and Canada, but lower prices for import from China and other countries.

Figure 14. Scallop import, export and re-export quantities (in pounds)

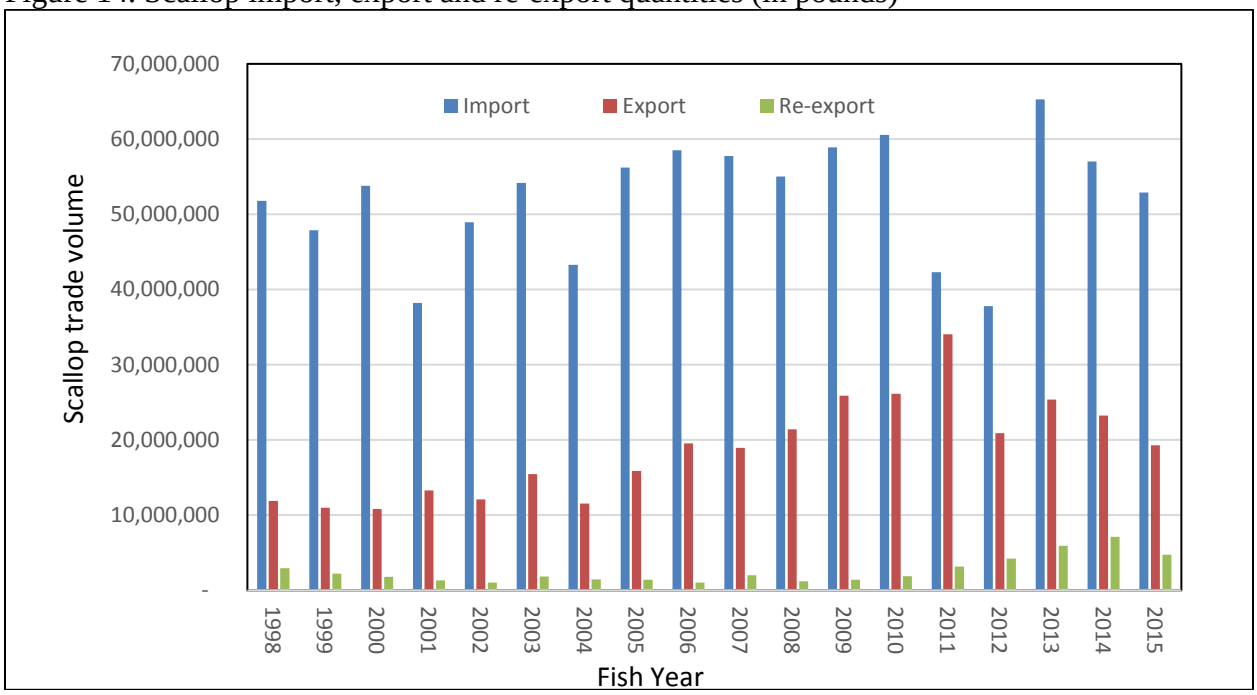


Figure 15. Average annual price of scallop exports and imports (in 2015 $ per pound)

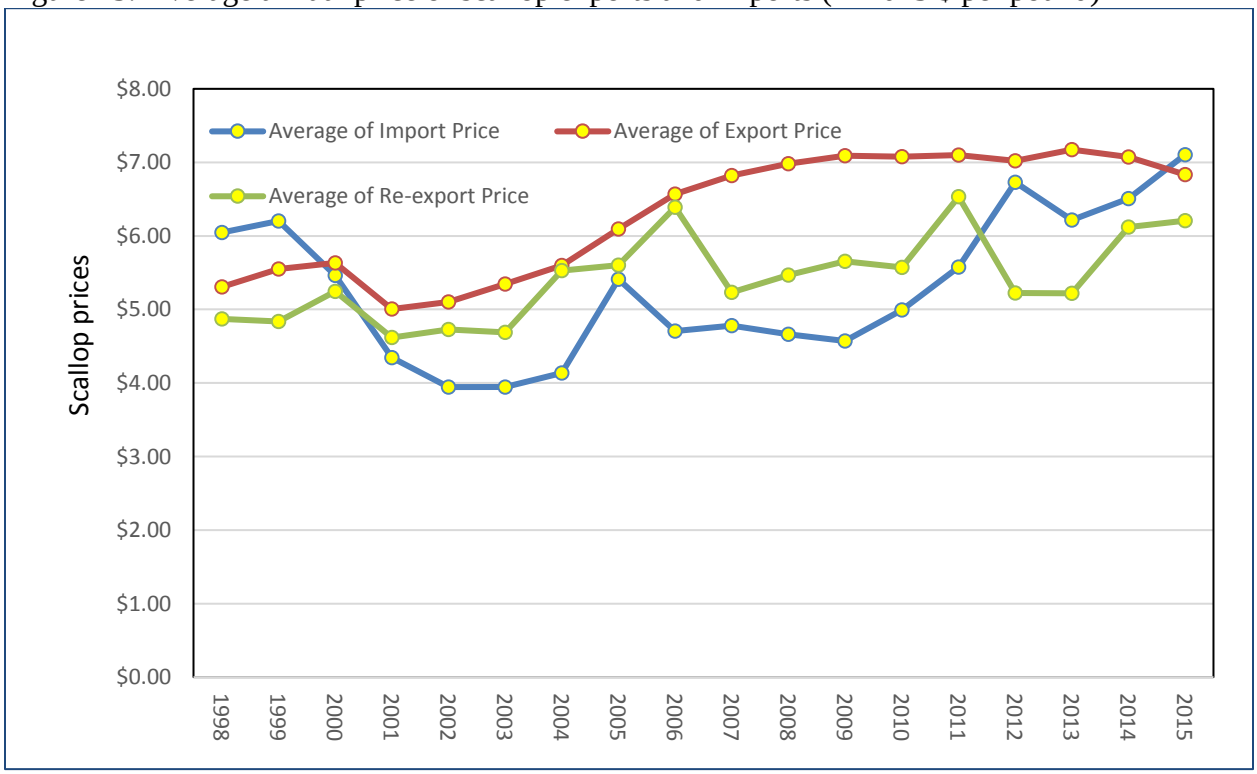


Figure 16. Value of scallop exports and imports (in 2015 $)

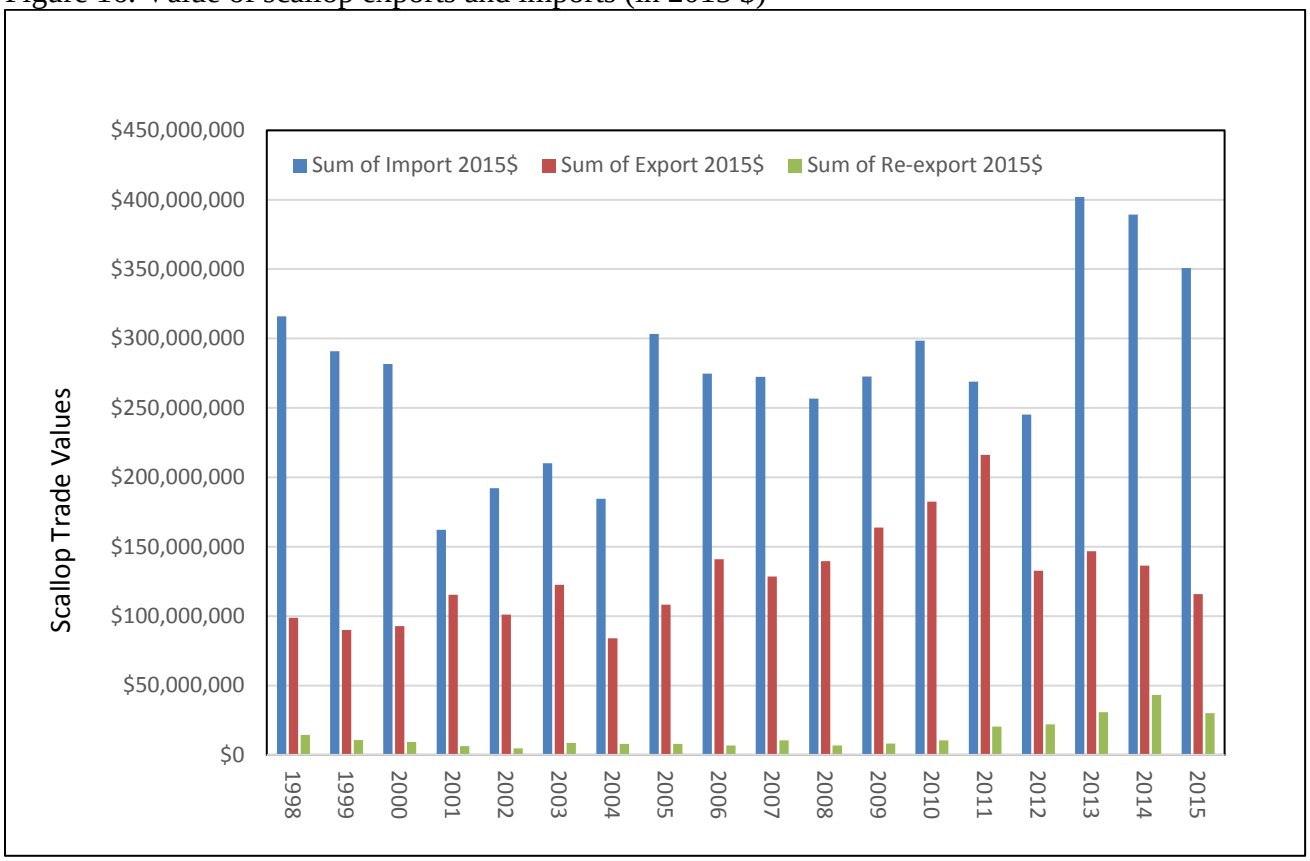


Figure 17. Scallop trade deficit value (in 2015 $)

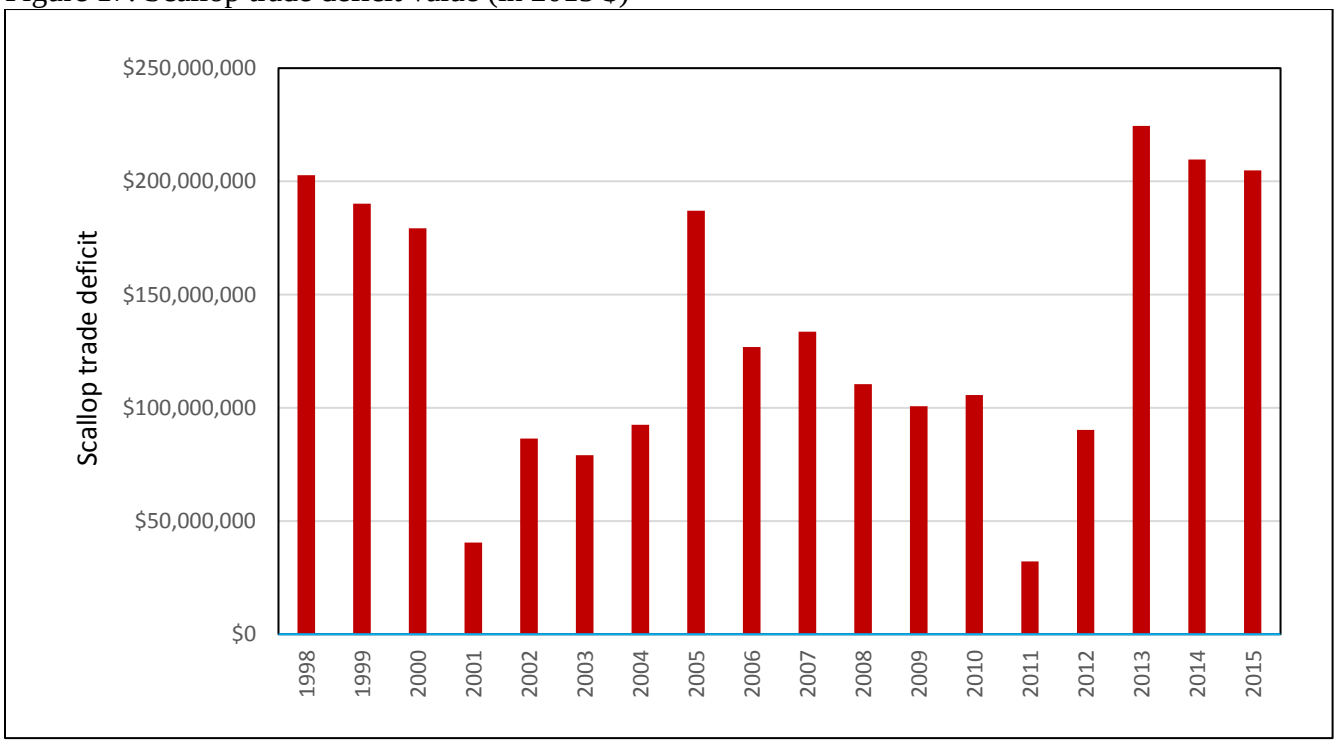


Figure 18. Scallop export volume (pounds) and price (in 2015$ per pound) by major country groups

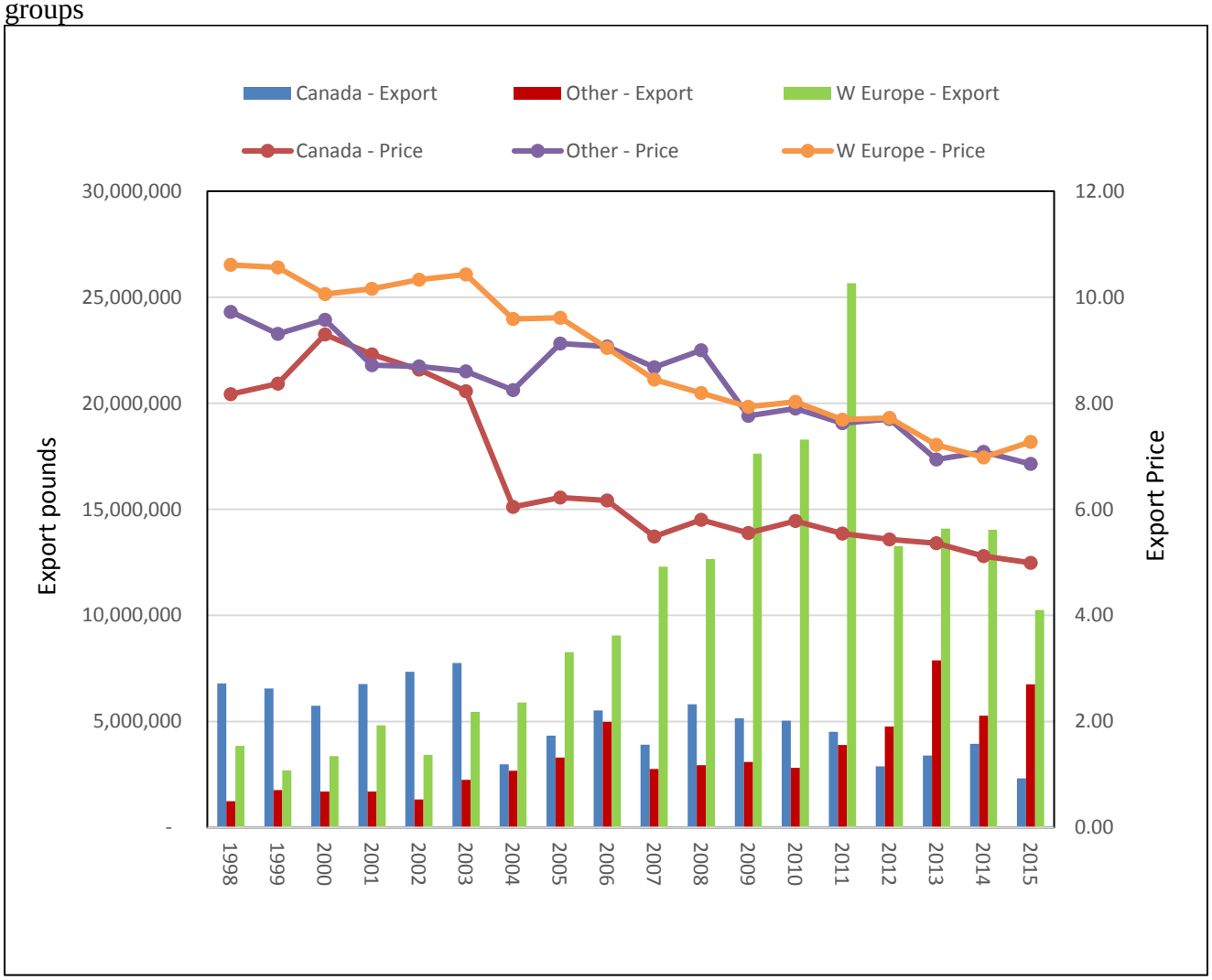


Figure 19. Scallop import volume (pounds) and price (in 2015$ per pound) by major country group