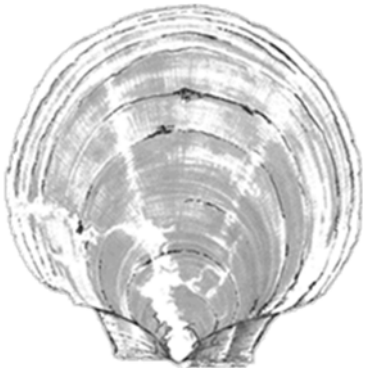
Scallop Fishery Management Plan

Framework Adjustment 32

Including an Environmental Assessment,
Regulatory Flexibility Analysis, and
Stock Assessment and Fishery Evaluation



[Version 1]

November 15, 2019

Prepared by the
New England Fishery Management Council
In consultation with the
National Marine Fisheries Service

New England
Fishery Management Council

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

3.0 BACKGROUND AND PURPOSE

3.1 BACKGROUND

This framework to the Scallop Fishery Management Plan (FMP) sets fishery specifications for fishing year (FY) 2020 and default measures for FY 2021. The New England Fishery Management (Council) decided to develop a one-year action only, including default measures for Year 2 only (FY2021).

The list of measures routinely addressed as part of scallop specifications 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 included in 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, Annual Catch Target (ACT) for the LA fishery; and Annual Projected Landings (APL) for LA and LAGC;
- 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 fleet wide, area-specific maximum number of access area trips available for the general category fishery;
- NGOM TAC(s);
- Incidental catch target-TAC; and set-aside of scallop catch for the industry funded observer program and research set-aside program.

The Council also has included other management measures for consideration in this action.

3.2 DRAFT PURPOSE AND NEED

This Framework (FW32) 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 manage total removals from the Northern Gulf of Maine management area, and to mitigate impacts on Georges Bank yellowtail flounder .

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 2020 fishing year, as well as default measures for FY2021 that are expected to be replaced by a subsequent action (

Table 1). The corresponding 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.

Table 1. DRAFT Purpose and need for Framework 32.

Purpose	Need
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 2020 fishing year, as well as default measures for FY2021 that are expected to be replaced by a subsequent action.	To achieve the objectives of the Atlantic Sea Scallop FMP to prevent overfishing and improve yield-per recruit from the fishery.
To set landing limits for the LA and LAGC components in the Northern Gulf of Maine management area based on exploitable biomass	To manage total removals from the Northern Gulf of Maine management area.

1.2 SUMMARY OF 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).

The OFL is specified as the level of landings and associated fishing mortality rate (F) that, above which, overfishing is occurring. The OFL will account for landings of scallops in state waters by vessels without Federal scallop permits. In 2018, SARC 65 approved an OFL equivalent to F = 0.64. To account for scientific uncertainty, ABC is set at a level with an associated F that has a 25-percent probability of exceeding the F associated with OFL (i.e., a 75-percent probability of being below the F associated with the OFL).

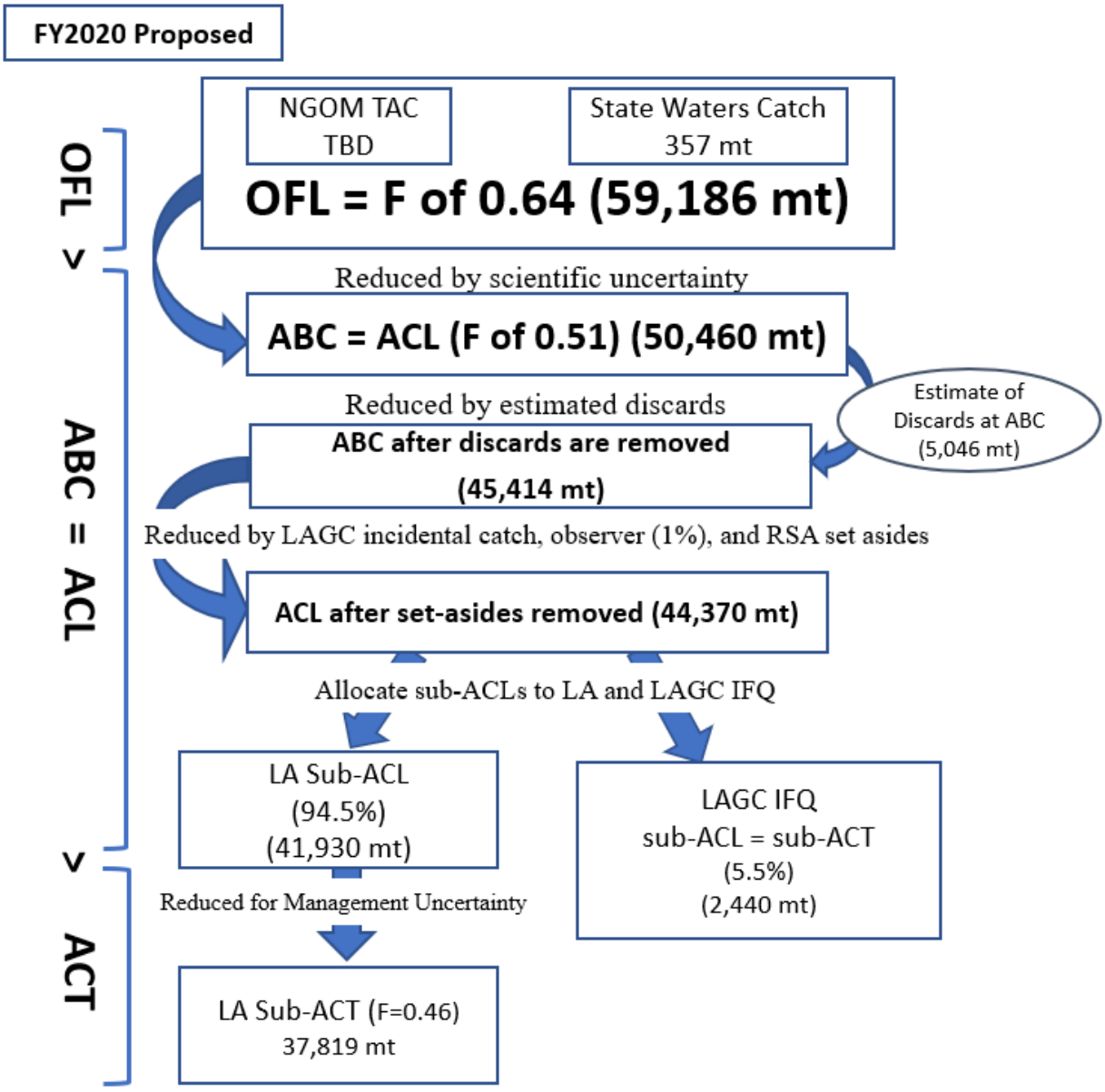
The ACL is equal to the ABC in the Scallop FMP. SARC 65 determined that the F associated with the ABC/ACL is F=0.51. Set-asides for observer and RSA are removed from the ABC (1 percent of the ABC/ACL and 1.25 mil lb. (567 mt) respectively). After those set-asides are removed, the remaining available 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 4 summarizes how the various ACL terms are related in the Scallop FMP.

Amendment 15 also established ACTs for each component in order to account for management uncertainty. For the LA fleet, the ACT will have an associated F that has a 25-percent chance of exceeding ABC (75% probability that the ACT will exceed the ABC/ACL). 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 the LA ACT is F = 0.46. For the LAGC fleet, the ACT will be set equal to the LAGC fleet's sub-ACL, since this component is quota managed and is presumed to have less management uncertainty. The fishery specifications allocated to the fishery may be set at an F rate lower

than the ACT, but fishery specifications may not exceed this level. For example, the Council's preferred alternative for FY 2018 specifications is anticipated to result in an overall F=0.175.

Finally, catch from the NGOM is established at the ABC/ACL level, but is not subtracted from the 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.

Figure 1 – Scallop ACL-Flowchart with proposed 2020 OFL, ABC, and ACL values.



4.0 ALTERNATIVES UNDER CONSIDERATION

4.1 ACTION 1 – OVERFISHING LIMIT AND ACCEPTABLE BIOLOGICAL CATCH

4.1.1 Alternative 1 - No Action for OFL and ABC

Under Alternative 1 (No Action), the OFL and ABC would be the default 2020 values adopted in Framework 30 (Table 2) that were calculated for FY2019 and FY2020 based on survey and fishery data through 2018. These would remain in place until a subsequent action replaced them. Through Framework 30, 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 F_{MSY}; 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 (Table 3), the estimate of discard mortality is removed first and allocations are based on the remaining ABC available (Table 2, column to the far right).

Table 2 - No Action OFL and ABC for FY 2020 (default) approved through Framework 30 (values in mt).

Fishing Year	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2020	59,447	50,943	4,915	46,028

Table 3 – No Action (default) ACL related values for the scallop fishery based on 2019 OFL and ABC approved through Framework 30.

Catch limits	2020 (mt)
Overfishing Limit	59,447
Acceptable Biological Catch/ACL (discards removed)	46,028
Incidental Catch	23
Research Set-Aside (RSA)	567
Observer Set-Aside	460
ACL for fishery	44,978
Limited Access ACL	42,504
LAGC Total ACL	2,474
LAGC IFQ ACL (5% of ACL)	2,249
Limited Access with LAGC IFQ ACL (0.5% of ACL)	225
Limited Access ACT (F=0.46)	38,337
Annual Projected Landings (APL)***	([1])
Limited Access Projected Landings (94.5% of APL)	([1])
Total IFQ Annual Allocation (5.5% of APL)	1,122**
LAGC IFQ Annual Allocation (5% of APL)	1,020**
Limited Access with LAGC IFQ Annual Allocation (0.5% of APL)	102**

*The catch limits for the 2020 fishing year are subject to change through a future specifications action or framework adjustment. This includes the setting of an APL for 2020 that will be based on the 2019 annual scallop surveys.

**As a precautionary measure, the 2020 IFQ annual allocations are set at 75% of the 2019 IFQ Annual Allocations.

***The APL value reflects the Council's preferred alternatives for specifications from FW30.

4.1.2 Alternative 2 – Updated OFL and ABC for FY 2020 and FY 2021 (default)

Alternative 2 would specify OFLs and ABCs for FY 2020 and set default values for FY 2021 based on recent October 2019 SSC recommendations shown in Table 4. The fishing mortality rates for OFL and ABC would be based on the results of SARC 65 (2018), and the control rule would be unchanged from No Action. The fishing mortality rate associated with the OFL would be F=0.64, while the F associated with the ABC would be F=0.51.

Once OFL and ABC are established, associated ACLs for the fishery can be defined. Table 5 summarizes the various ACL allocations for the fishery based on decisions made in Amendment 15 when ACLs were implemented.

Rationale:

Table 4 – Alternative 2 OFL ad ABC values for FY 2020 and FY 2021 (default).

Fishing Year	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2020	59,186	50,460	5,046	45,414
2021	47,503	40,430	3,995	36,435

Table 5 - Alternative 2 ACL related values for the scallop fishery based on 2020 and 2021 OFL and ABC.

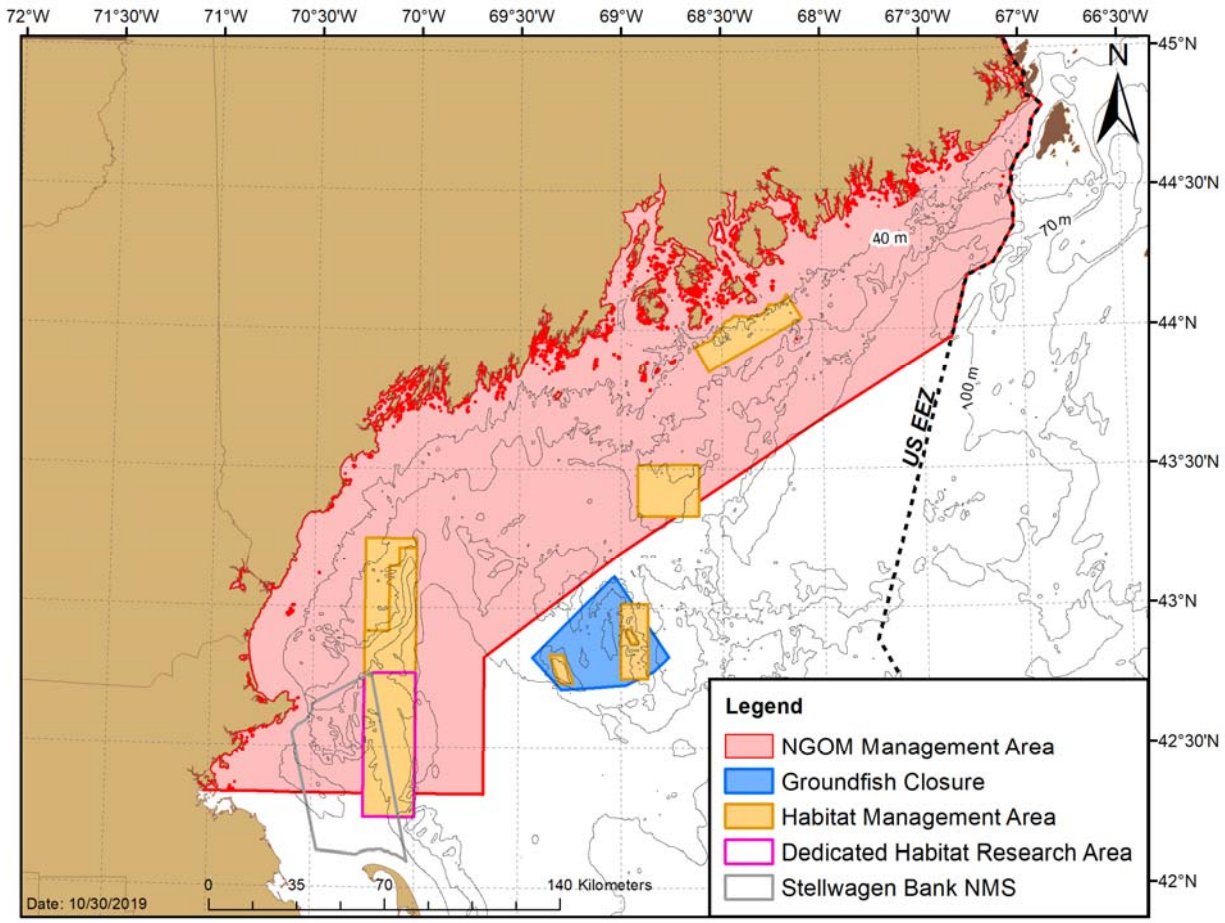
Catch Limits	FY2020	FY2021
	mt	mt
OFL	59,186	47,503
ABC/ACL (discards removed)	45,414	36,435
Incidental Catch	23	23
RSA	567	567
Observer set-aside	454	364
ACL for fishery	44,370	35,481
Limited Access ACL	41,930	33,530
Limited Access ACT	37,819	30,242
LAGC Total ACL	2,440	1,951
LAGC IFQ ACL	2,219	1,774
LA w/ LAGC IFQ ACL (0.5% of ACL)	222	177

4.2 ACTION 2 – NORTHERN GULF OF MAINE MANAGEMENT AREA

Action 2 addresses management in the Northern Gulf of Maine (Map 1). In Framework 32, the Council is considering action on two issues: 1) the partial closure of Stellwagen Bank, north of 42°20'N, to protect small scallops, and; 2) TAC setting for the management unit using the temporary approach approved through Framework 29, and used in Framework 30.

Note: The Council is considering alternative methods of TAC sharing through Amendment 21 to the Scallop FMP.

Map 1 – The Northern Gulf of Maine Management Area relative to groundfish closures, habitat management areas, and the Stellwagen Bank National Marine Sanctuary.



4.2.1 Partial Closure of Stellwagen Bank to Protect Small Scallops

4.2.1.1 Alternative 1 – No Action

Under Alternative 1, there would be no change to where the LAGC or LA components can fish in the NGOM Management Area. Stellwagen Bank would be open to fishing while the management area is open to directed scallop fishing.

4.2.1.2 Alternative 2 – Partial Closure of Stellwagen Bank to directed scallop fishing, within the Northern Gulf of Maine Management Area (2 year closure)

Alternative 2 would close part of Stellwagen Bank north of 42°20'N to directed scallop fishing in the NGOM Management Area for two years (FY2020-2021) to protect small scallops that were observed in 2019 dredge surveys of this area. The closure would cover roughly 71 mi^2 (183 km^2) of Stellwagen Bank, directly north of the southern boundary of the NGOM Management Area and directly west of the Western Gulf of Maine Groundfish Closure Area. This closure would protect a substantial number of small scallops that have not recruited into the fishery. The closure area is shown in Map 2, and closure coordinates are provided in Table 6.

Rationale: The 2019 ME DMR/UMaine dredge survey of the Northern Gulf of Maine detected many small scallops on Stellwagen Bank. Alternative 2 closes part of the NGOM management area to improve the yield-per-recruit of these scallops, while providing some access to larger, older scallops that were also observed in the 2019 surveys. The directed scallop fishing could be expected north and west of the closure boundaries as well as on southern Jeffreys Ledge and in Ipswich Bay.

Map 2 – Boundary of partial closure of Stellwagen Bank to directed scallop fishing within the NGOM Management Area (Alternative 2).

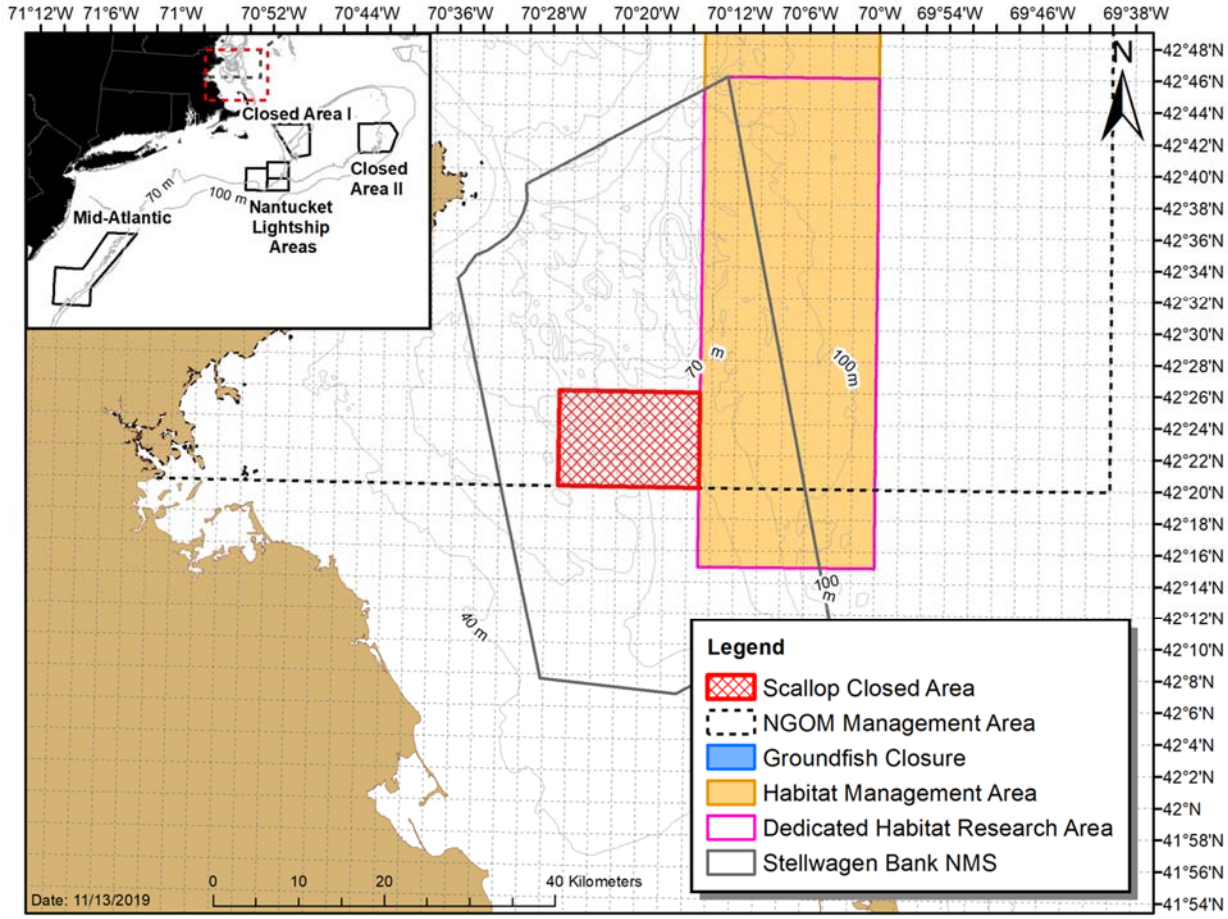


Table 6 – Coordinates of partial closure of Stellwagen Bank to directed scallop fishing within the NGOM Management Area (Alternative 2).

Point	Latitude	Longitude
1	42° 26' 0" N	70° 27' 0" W
2	42° 26' 0" N	70° 15' 0" W
3	42° 20' 0" N	70° 15' 0" W
4	42° 20' 0" N	70° 27' 0" W
5	42° 26' 0" N	70° 27' 0" W

4.2.2 Northern Gulf of Maine TAC Setting

Alternatives in Framework 32 were developed to be consistent with the problem statement that the Council developed in Framework 29 and are consistent with measures implemented through FW29 (FY2018) and FW30 (FY2019):

> *Recent high landings and unknown biomass in the NGOM scallop management area underscore the critical need to initiate surveys and develop additional tools to better manage the area and fully understand the total removals from the management area.*

The Council also approved measures in Framework 29 that have enabled the tracking of total removals from the Northern Gulf of Maine management area since FY2018.

Method for setting NGOM TAC. Both Alternatives under consideration in this section (Alternative 1 and Alternative 2) would maintain the same approach to developing and splitting a total TAC for the NGOM that was implemented though Framework 29 for FY2018. The LAGC share would be calculated by applying the first 70,000 lbs to LAGC TAC, and then splitting the remaining pounds 50/50 between the LAGC and LA component. The rationale for this approach is that the NGOM TAC for the LAGC component was set at 70,000 pounds from FY 2008 – FY 2016. This TAC split is intended to be a short-term solution to allow controlled fishing in the NGOM management area until Amendment 21 can address NGOM issues more holistically. This approach—the first 70,000 pounds to the LAGC, then 50/50 split between LA and LAGC—is not intended to be permanent.

Under both Alternative 1 and Alternative 2, the LAGC and LA (RSA) shares would operate under separate TACs. The NGOM management area would remain open for each component until their TAC is projected to be harvested, even if the other component has reached its TAC. The LA share of the NGOM TAC would be available for RSA compensation fishing only. Any LA or LAGC vessels that are awarded NGOM RSA compensation pounds would be required to declare into the area and fish exclusively within the NGOM management area. Any NGOM RSA harvest overages would be deducted from the following year's LA TAC.

4.2.2.1 Alternative 1 – No Action

The total NGOM hard TAC would be set at 170,000 pounds, which is based on fishing Ipswich Bay, Stellwagen Bank, and Jeffreys Ledge portions of the management area at a F=0.20 in FY 2019 and FY 2020. The overall TAC would be split between the LA and LAGC, with 50,000 pounds available to support RSA compensation fishing (LA share), and 120,000 pounds available for harvest by the LAGC component. The area would open on April 1, 2020 with no change to the current management program.

The NGOM management area would remain open for each component until their TAC is projected to be harvested, even if the other component has reached its TAC. For example, if the LAGC component harvests its TAC before all NGOM RSA compensation pounds are harvested, the area would remain open for NGOM RSA compensation fishing.

Table 7 - The FY 2020 NGOM TAC under Alternative 1 - No Action (default measures from FW30)

Year	2020 TAC (lbs)
Overall TAC	170,000
LA (RSA) TAC	50,000
LAGC TAC	120,000

Rationale: Specifying a total NGOM TAC at 170,000 pounds and capping removals is consistent with the Council's problem statement and default measures set through FW29. This approach is intended to be a

short-term solution until a future action can be developed to address NGOM issues more holistically (through Amendment 21).

4.2.2.2 Alternative 2 - Set 2020 and 2021 NGOM TAC, with first 70,000 lbs to LAGC, then 50/50 split between LA and LAGC

As noted at the outset of this section, alternatives under consideration (4.2.2.1 and 4.2.2.2) maintain the Council's preferred short-term approach to managing the NGOM that was developed through FW29. Since this is considered a temporary approach until Amendment 21 can be developed and implemented, several key elements of the management strategy are restated here for clarity.

The total NGOM hard TAC would be set by applying a fishing mortality rate to the projected exploitable biomass from Ipswich Bay, and Jeffreys Ledge. Removals for all fishery components (General Category and Limited Access permit holders) would be capped at specified TAC equivalent to the 2020 and 2021 (default) fishing mortality rate in sub-Option 1, sub-Option 2, or sub-Option 3.

The LA share of the NGOM TAC would be available for RSA compensation fishing only. This would not be in addition to the 1.25 million lbs set-aside for the RSA program. These pounds would not be exclusive to RSA research in the NGOM, but priority would be given to support research projects in the NGOM. Any LA or LAGC vessels that are awarded NGOM RSA compensation pounds would be required to declare into the area and fish exclusively within the NGOM management area. Any NGOM RSA harvest overages would be deducted from the following year's LA TAC.

The LAGC share would be calculated by applying the first 70,000 lbs to LAGC TAC, and then splitting the remaining pounds 50/50 between the LAGC and LA component. The LAGC and LA (RSA) would operate under separate TACs.

The NGOM management area would remain open for each component until their TAC is projected to be harvested, even if the other component has reached its TAC. For example, if the LAGC component harvests its TAC before all NGOM RSA compensation pounds are harvested, the area would remain open for NGOM RSA compensation fishing.

Rationale: Survey data reflects the most up-to-date scientific information for the scallop resource in the NGOM. Capping removals for all fishery components at the specified TAC addresses the Council's 2017 problem statement of fully understanding total removals from the management area

4.2.2.2.1 Sub-Option 1 – Set NGOM TAC at F=0.18

The overall NGOM TAC would be set by applying a fishing mortality rate of F=0.18 to the exploitable biomass in Ipswich Bay and on Jeffrey's Ledge. The FY 2020 overall TAC would be set at 310,000 lbs, and the FY 2021 default TAC would be set at 240,000 lbs. The LAGC share of the FY 2020 NGOM TAC would be 190,000 lbs, while the LA/RSA share would be set at 120,000 lbs.

4.2.2.2.2 Sub-Option 2 – Set NGOM TAC at F=0.20

The overall NGOM TAC would be set by applying a fishing mortality rate of F=0.20 to the exploitable biomass in Ipswich Bay and on Jeffrey's Ledge. The FY 2020 overall TAC would be set at 350,000 lbs, and the FY 2021 default TAC would be set at 265,000 lbs. The LAGC share of the FY 2020 NGOM TAC would be 210,000 lbs, while the LA/RSA share would be set at 140,000 lbs.

4.2.2.2.3 Sub-Option 3 – Set NGOM TAC at F=0.25

The overall NGOM TAC would be set by applying a fishing mortality rate of F=0.25 to the exploitable biomass in Ipswich Bay and on Jeffrey's Ledge. The FY 2020 overall TAC would be set at 435,000 lbs,

and the FY 2021 default TAC would be set at 320,000 lbs. The LAGC share of the FY 2020 NGOM TAC would be 252,500 lbs, while the LA/RSA share would be set at 182,500 lbs.

Table 8 - Comparison of overall NGOM TAC Options in FW32

Alternative in FW32	F_{TARGET}	FY2020 TAC	FY2021 TAC
A1		170,000	
A2, Sub1	F=0.18	310,000	240,000
A2, Sub2	F=0.20	350,000	265,000
A2, Sub3	F=0.25	435,000	320,000

Table 9 - Comparison of Potential NGOM TACs for LA (RSA) and LAGC for FY 2019 (lbs) for each sub-option considered in Alternative 2 of Section 4.2

FW 32 Alternative	FW 32 Section	F	2020 TAC (lbs)	LA/RSA Share (lbs)	LAGC Share (lbs)
1	4.2.1		170,00	50,000	120,000
2, Sub-Option 1	4.2.2.2.1	0.18	310,000	120,000	190,000
2, Sub-Option 2	4.2.2.2.2	0.20	350,000	140,000	210,000
2, Sub-Option 3	4.2.2.2.3	0.25	435,000	182,500	252,500

4.3 ACTION 3 - FISHERY SPECIFICATIONS

The LA (94.5%) and LAGC IFQ (5.5%) allocations are based on Annual Projected Landings (APL). The APL is the projected harvest of exploitable scallops that are available under each alternative after the research set-aside, observer set-aside, and incidental catch have been removed from the sub-ACLs for the LA and LAGC IFQ components, as specified in Section 4.1, Overfishing Limit and Acceptable Biological Catch.

Table 10 - Comparison of allocations and DAS associated with each specification alternative.

Alternative In FW32	Description	Overall F rate	Open area F	Annual Projected Landings (APL)	APL w/ set-asides removed	LA Share (94.5%)	LAGC IFQ Share (5.5%)
4.3.1	No Action	0.061	0.24	27,593,057	25,292,158	23,901,089	1,391,069
4.3.2.1	CAII ext Open 20 DAS	0.18	0.24	48,633,975	46,333,076	43,784,757	2,548,319
4.3.2.2	CAII ext Open 22 DAS	0.183	0.27	50,353,581	48,052,682	45,409,784	2,642,897
4.3.2.3	CAII ext Open 24 DAS	0.189	0.3	52,046,731	49,745,832	47,009,811	2,736,021
4.3.3.1	CAII ext Closed 20 DAS	0.177	0.27	48,307,691	46,006,792	43,476,418	2,530,374
4.3.3.2	CAII ext Closed 22 DAS	0.18	0.3	49,972,181	47,671,282	45,049,361	2,621,921
4.3.3.3	CAII ext Closed 24 DAS	0.182	0.33	51,619,034	49,318,135	46,605,638	2,712,497
4.3.4.1	SF & CAII ext Closed 20 DAS	0.171	0.3	46,693,907	44,393,008	41,951,393	2,441,615
4.3.4.2	SF & CAII ext Closed 22 DAS	0.175	0.34	48,208,483	45,907,584	43,382,667	2,524,917
4.3.4.3	SF & CAII ext Closed 24 DAS	0.18	0.38	49,696,603	47,395,704	44,788,940	2,606,764

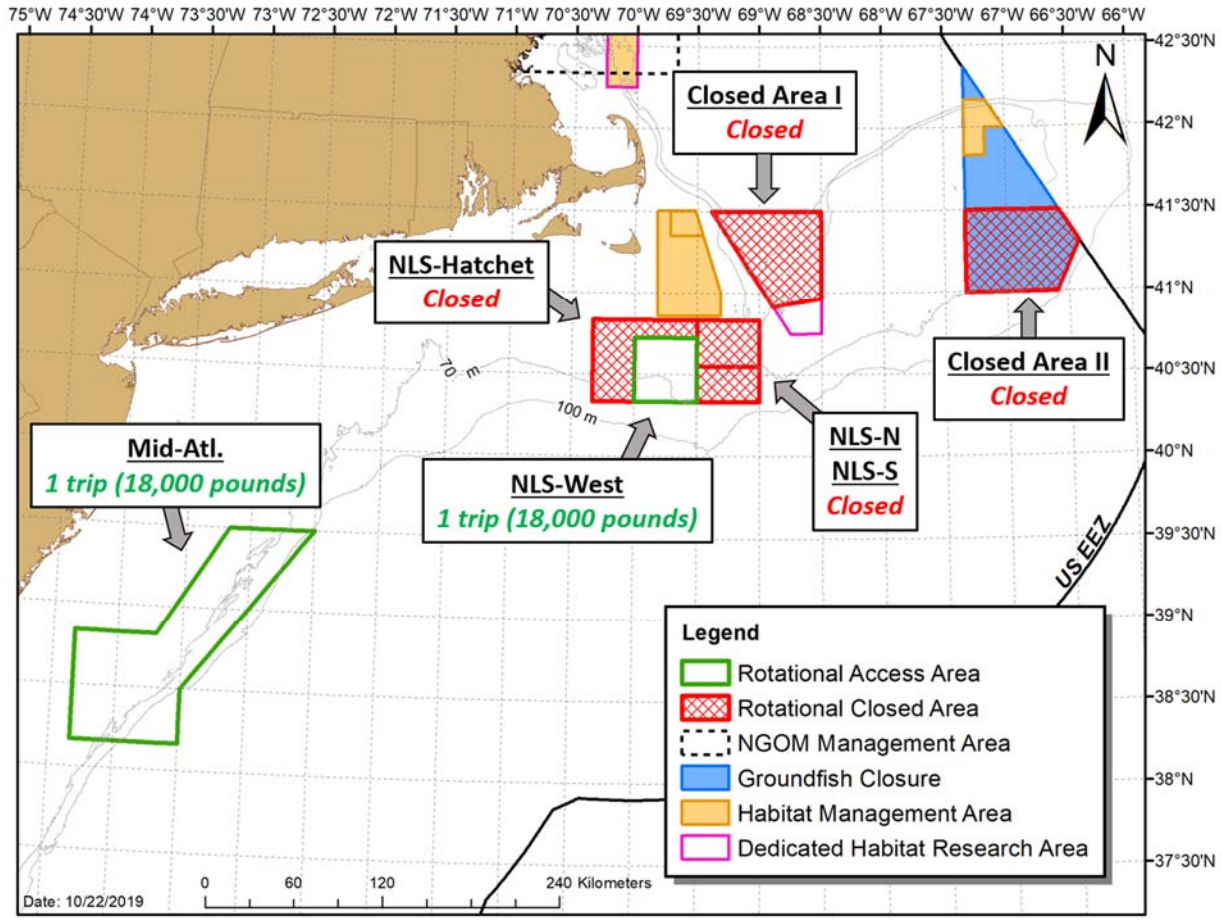
4.3.1 Alternative 1 – No Action (Default Measures)

Under Alternative 1 – No Action, the default specifications approved in Framework 30 would remain in place for the 2020 fishing year. There would be no allocations specified for the 2021 fishing year. Default measures approved in Framework 30 include full-time Limited Access DAS set at 18, which are 75% of the projected DAS for FY2019. Part-time Limited Access vessels would receive 7.20 DAS, and Occasional Limited Access vessels would be allocated 1.5 DAS. The LA component would have some access to the Mid-Atlantic Access Area and Nantucket Lightship West areas, the equivalent of one 18,000-pound trip for FT vessels in each area (Map 3).

Under the FW30 default measures for FY 2020, the LAGC IFQ allocation would be 1,122 mt (2,473,587 lbs) for LAGC IFQ and LA with LAGC IFQ quota. This allocation is equivalent to 5.5% of the annual projected landings (APL) for FY2019 from FW30. LAGC IFQ vessels would also have access in the Mid-Atlantic Access Area and Nantucket Lightship West areas on April 1, 2020 under default measures, with a fleet wide maximum of 571 trips to each area.

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

Map 3 – Spatial management under Alternative 1 (No Action).



4.3.2 Alternative 2 – Six Access Area Trips, Closed Area II-ext open

If the Council selects Alternative 2 as preferred, it will also need to select a DAS sub-option.

Alternative 2 would allocate a total of six access area trips, four would be 18,000 pounds allocations, along with two ½ trips (9,000-pound allocations). Access areas open to the fishery under this scenario would be: The Mid-Atlantic Access Area (2 FT LA trips), Closed Area II Access Area (1 FT LA trip), Closed Area I Access Area (1/2 FT LA FLEX trip), and the Nantucket Lightship North Access Area (1/2 FT LA trips), and the Nantucket Lightship South Deep Access Area (1 FT LA trip).

Alternative 2 is considering modifications to the traditional CAII AA boundary the would make the eastern portion of the area (i.e. CAII-Southeast) available to the fishery while the western portion of the area (i.e. CAII-Southwest) will be closed to scallop fishing for the entire year (Map 4). Coordinates of the

proposed CAII-Southwest closure are provided in Table 12. The eastern boundary of CAII AA would be extended east to the Hague Line.

Within the Nantucket Lightship region, boundaries for the NLS-North would be expanded south to encompass part of the NLS-S-Shallow and the boundary for the NLS-South would shift to focus around the dense aggregations of slow-growing scallops in the deeper water (i.e. 70 m depth and greater). The NLS-South boundary was also expanded south by 5'. Alternative 2, as well as Alternatives 3 and 4, would establish a small area between the NLS-North and NLS-South, designated as the "Nantucket Lightship Triangle" (NLS-Triangle), which would be closed to the fishery for FY2020. Coordinates for the proposed NLS-Triangle closure are provided in Table 13. The Nantucket Lightship Hatchet area, which remained closed as a rotational management area following the partial approval of OHA2 would become open bottom under this option. The Nantucket Lightship Hatchet was the remainder of the original Nantucket Lightship Groundfish Closure that did not overlap with scallop access areas.

In the open bottom (areas outside of rotational management areas and closures), the fishery would have access to the Closed Area II-ext, which is closed in Alternative 3 and Alternative 4. In all alternatives, the Nantucket Lightship West area, which was an access area in FY 2018 and FY 2019 would be open bottom.

The specific allocations associated with Alternative 2:

- The FY2020 Annual Projected Landings (APL) for this alternative are 48.6 million pounds (open area F=0.24, 20 DAS), 50.3 million pounds (open area F=0.27, 22 DAS), or 52 million pounds (open area F=0.3, 24 DAS) before set-asides are accounted for (i.e. RSA, observer).
- Each full-time limited access vessel would be allocated a total of 90,000 access area pounds (see Table 11). The FT LA trip limit would be set at 18,000 lbs in all available access areas: Closed Area II, Closed Area I, the Mid-Atlantic Access Area, Nantucket Lightship South Deep, and Nantucket Lightship North.
- The FLEX trip allocation (9,000 pounds) could be fished only within Closed Area I or the MAAA (see Table 11). This option would allow LA vessels to more broadly distribute effort if Closed Area I biomass projections are overly optimistic.
- Access area allocations would be set at 36,000 pounds for PT LA vessels. LA PT trip limit would be set at 12,000 pounds, and PT vessels would receive two (2) MAAA trips and one (1) Closed Area II trip.
- The LAGC incidental target TAC would be set at 50,000 lbs.
- Allocated Limited Access access area trips would be available in the same access areas defined by Framework 32 for the first 60 days of FY2021, even if the area is scheduled to close in FY 2021. Vessels planning to fish 2020 access area allocation must start their trip (i.e., position on their VMS unit seaward of the demarcation line) by 23:59 on May 30, 2021. For example, trips allocated to the NLS-S-Deep Access Area could only be fished in the access area boundary defined by FW32 in the first 60 days of FY2021.
- FY2021 default measures under Alternative 2 would allocate FT LA vessels one (1) 18,000 pound access area trip to the Mid-Atlantic Access Area as defined by Framework 32. PT LA vessels would be allocated one 7,200 pound access area trip to the Mid-Atlantic Access Area, as defined by Framework 32. The LAGC IFQ component would also receive access area trips to the MAAA, proportional to 5.5% of the default access area allocations to each area (trips to the MAAA). The LAGC IFQ and LA DAS allocations would be set at 75% of the 2020 allocations.

Rationale: As a response to the large year class of scallops observed in and around CAII AA in 2019, this alternative is considering modifications to the traditional CAII AA boundary which will focus fishery effort in the eastern portion of the area (i.e. CAII-Southeast) and the western portion of the area (i.e. CAII-Southwest) will be closed to scallop fishing for the entire year (Map 4). The eastern boundary of CAII AA would be extended east to the Hague Line to encompass the large scallops just outside of the

traditional CAII boundary. The majority of scallops in the eastern portion of CAII AA will be exploitable and are anticipated to have high yield, whereas the western portion of the area is mostly home to the large set of 2-year-old scallops that have not yet recruited to the fishery.

Modifications to rotational boundaries in the Nantucket Lightship region are intended to optimize yield in this part of the resource. Expanding the NLS-North boundary to encompass the shallow portion of the former NLS-South would increase the biomass of adult scallops in the NLS-North and improve this fishing opportunity in FY2020. Adjusting the NLS-South boundary around the dense aggregation of slow-growing scallops is intended to focus fishing effort on the large year class of scallops in this area that will be 8 years old in FY2020. Expanding the NLS-South boundary southward by 5' will expand the area and provide vessels more room to fish considering that the scallops are relatively concentrated there. The NLS-Triangle closure comprises a small area with low scallop densities that could be used for research purposes in the absence of fishing. Establishment of the NLS-Triangle does not bind the Council to facilitating or supporting research in this area in any way.

The NLS-Hatchet area remained closed following the partial approval of OHA2 and the removal of the Nantucket Lightship groundfish closed area because there was no survey scallop survey or fishery data to inform potential fishing effort or other impacts from re-opening the area. This area is outside of the scallop dredge survey strata and outside of the projection model (SAMS) domain and is not known to be productive scallop bottom. A 2018 survey of the area using the HabCam v3 towed vehicle did not detect any scallops larger than 35mm in this area. Since the area has been recently surveyed, and no scallops were detected, it is highly unlikely that the area would be fished.

Table 11 - Summary of Alternative 2 Access Area Allocations

Open Access Areas	Allocation	Where Can Trips Be Fished?	How Can the trips be traded?
Closed Area II	One 18,000 lb trip	• Closed Area II	XX
Closed Area I	½ trip FLEX trip, 9,000 lb allocation	FLEX trip allocation can be fished within any of the following access areas: • Closed Area I • MAAA	
Nantucket Lightship North	½ trip, 9,000 lb allocation	• NLS-North Only	
Nantucket Lightship South Deep	One 18,000 lb trip	• NLS-West Only	
Mid-Atlantic Access Area	Two 18,000 lb trips	• MAAA Only	

Map 4 – Spatial management under Alternative 2 (six trip option with CAII-ext open area).

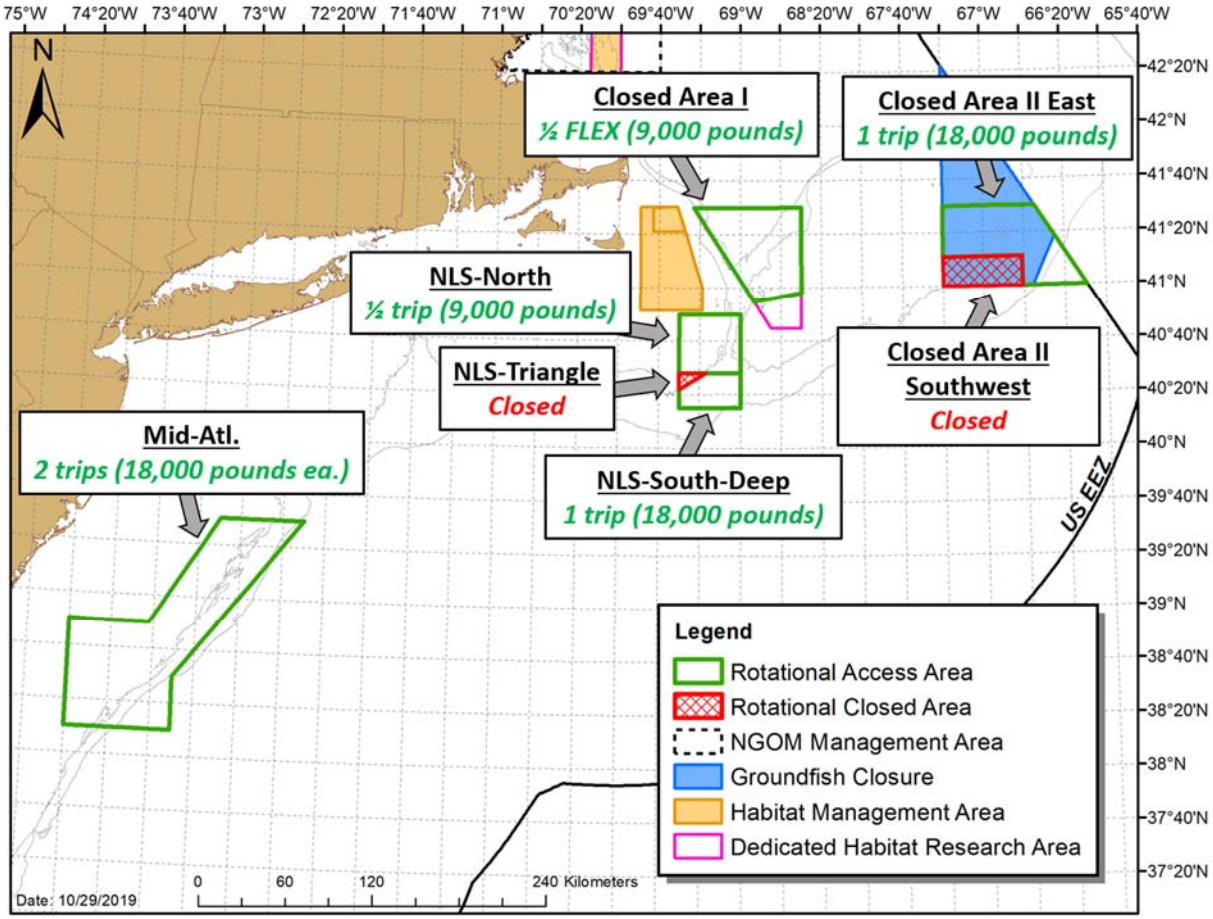


Table 12 – Coordinates of the CAII-Southwest closure proposed under Alternative 2.

Point	Latitude	Longitude
1	41° 11' 0" N	67° 20' 0" W
2	41° 11' 0" N	66° 41' 0" W
3	41° 0' 0" N	66° 41' 0" W
4	41° 0' 0" N	67° 20' 0" W
5	41° 11' 0" N	67° 20' 0" W

Table 13 – Coordinates of the Nantucket Lightship Triangle closure proposed under Alternative 2, Alternative 3, and Alternative 4.

Point	Latitude	Longitude
1	40° 28' 0" N	69° 30' 0" W
2	40° 28' 0" N	69° 17' 0" W
3	40° 22' 0" N	69° 30' 0" W
4	40° 28' 0" N	69° 30' 0" W

4.3.2.1 Sub-Option 1 – Open area fishing at F=0.24 (20 DAS)

Sub-Option 1 would set the FT LA DAS at 20, which is expected to result in an average open area fishing mortality rate of F=0.24 in open areas. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 46,333,076 lbs.
- The LAGC IFQ APL (5.5%) would be 2,548,319 lbs. The LAGC IFQ only (5% of APL) would be set at 2,316,654 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,911,239 lbs.

4.3.2.2 Sub-Option 2 – Open area fishing at F=0.27 (22 DAS)

Sub-Option 2 would set the FT LA DAS at 22, which is expected to result in an average open area fishing mortality rate of F=0.27 in open areas. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 48,052,682 lbs.
- The LAGC IFQ APL (5.5%) would be 2,642,897 lbs. The LAGC IFQ only (5% of APL) would be set at 2,402,634 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,982,173 lbs.

4.3.2.3 Sub-Option 3 – Open area fishing at F=0.30 (24 DAS)

Sub-Option 3 would set the FT LA DAS at 24, which is expected to result in an average open area fishing mortality rate of F=0.30 in open areas. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 49,745,832 lbs.
- The LAGC IFQ APL (5.5%) would be 2,736,021 lbs. The LAGC IFQ only (5% of APL) would be set at 2,487,292 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 2,052,016 lbs.

4.3.3 Alternative 3 – Six Access Area Trips, Closed Area II-ext closed to open bottom fishing

If the Council selects Alternative 3 as preferred, it will also need to select a DAS sub-option.

Alternative 3 would allocate a total of six access area trips, four would be 18,000 pounds allocations, along with two ½ trips (9,000 pound allocations). Access areas open to the fishery under this scenario would be: The Mid-Atlantic Access Area (2 FT LA trips), Closed Area II Access Area (1 FT LA trip), Closed Area I Access Area (1/2 FT LA FLEX trip), and the Nantucket Lightship North Access Area (1/2 FT LA trips), and the Nantucket Lightship South Deep Access Area (1 FT LA trip).

In the open bottom (areas outside of rotational management areas and closures), the fishery would not have access to the Closed Area II-Extension, which is also closed Alternative 4, but open in Alternative 2. Coordinates of the CAII-Southwest and CAII-Extension closure are provided in Table 14. In all alternatives, the Nantucket Lightship West area, which was an access area in FY 2018 and FY 2019 would be open bottom.

Within the Nantucket Lightship region, boundaries for the NLS-North would be expanded south to encompass part of the NLS-S-Shallow and the boundary for the NLS-South would shift to focus around the dense aggregations of slow-growing scallops in the deeper water (i.e. 70 m depth and greater). The NLS-South boundary was also expanded south by 5'. Alternative 3, as well as Alternatives 2 and 4, would establish a small area between the NLS-North and NLS-South, designated as the "Nantucket Lightship Triangle" (NLS-Triangle), which would be closed to the fishery for FY2020. Coordinates for the proposed NLS-Triangle closure are provided in Table 13. The Nantucket Lightship Hatchet area, which remained closed as a rotational management area following the partial approval of OHA2 would become open bottom under this option. The Nantucket Lightship Hatchet was the remainder of the original Nantucket Lightship Groundfish Closure that did not overlap with scallop access areas.

The specific allocations associated with Alternative 3:

- The FY2020 Annual Projected Landings (APL) for this alternative are 48.3 million pounds (open area F=0.27, 20 DAS), 50.0 million pounds (open area F=0.30, 22 DAS), or 51.6 million pounds (open area F=0.33, 24 DAS) before set-asides are accounted for (i.e. RSA, observer).
- Each full-time limited access vessel would be allocated a total of 90,000 access area pounds (see Table 11). The FT LA trip limit would be set at 18,000 lbs in all available access areas: Closed Area II, Closed Area I, the Mid-Atlantic Access Area, Nantucket Lightship South Deep, and Nantucket Lightship North.
- The FLEX trip allocation (9,000 pounds) could be fished only within Closed Area I or the MAAA (see Table 11). This option would allow LA vessels to more broadly distribute effort if Closed Area I biomass projections are overly optimistic.
- Access area allocations would be set at 36,000 pounds for PT LA vessels. LA PT trip limit would be set at 12,000 pounds, and PT vessels would receive two (2) MAAA trips and one (1) Closed Area II trip.
- The LAGC incidental target TAC would be set at 50,000 lbs.
- Allocated Limited Access access area trips would be available in the same access areas defined by Framework 32 for the first 60 days of FY2021, even if the area is scheduled to close in FY 2021. Vessels planning to fish 2020 access area allocation must start their trip (i.e., position on their VMS unit seaward of the demarcation line) by 23:59 on May 30, 2021. For example, trips allocated to the NLS-S-Deep Access Area could only be fished in the access area boundary defined by FW32 in the first 60 days of FY2021.
- FY2021 default measures under Alternative 2 would allocate FT LA vessels one (1) 18,000 pound access area trip to the Mid-Atlantic Access Area as defined by Framework 32. PT LA

vessels would be allocated one 7,200 pound access area trip to the Mid-Atlantic Access Area, as defined by Framework 32. The LAGC IFQ component would also receive access area trips to the MAAA, proportional to 5.5% of the default access area allocations to each area (trips to the MAAA). The LAGC IFQ and LA DAS allocations would be set at 75% of the 2020 allocations.

Map 5 – Spatial management under Alternative 3 (CAII-Southwest closure).

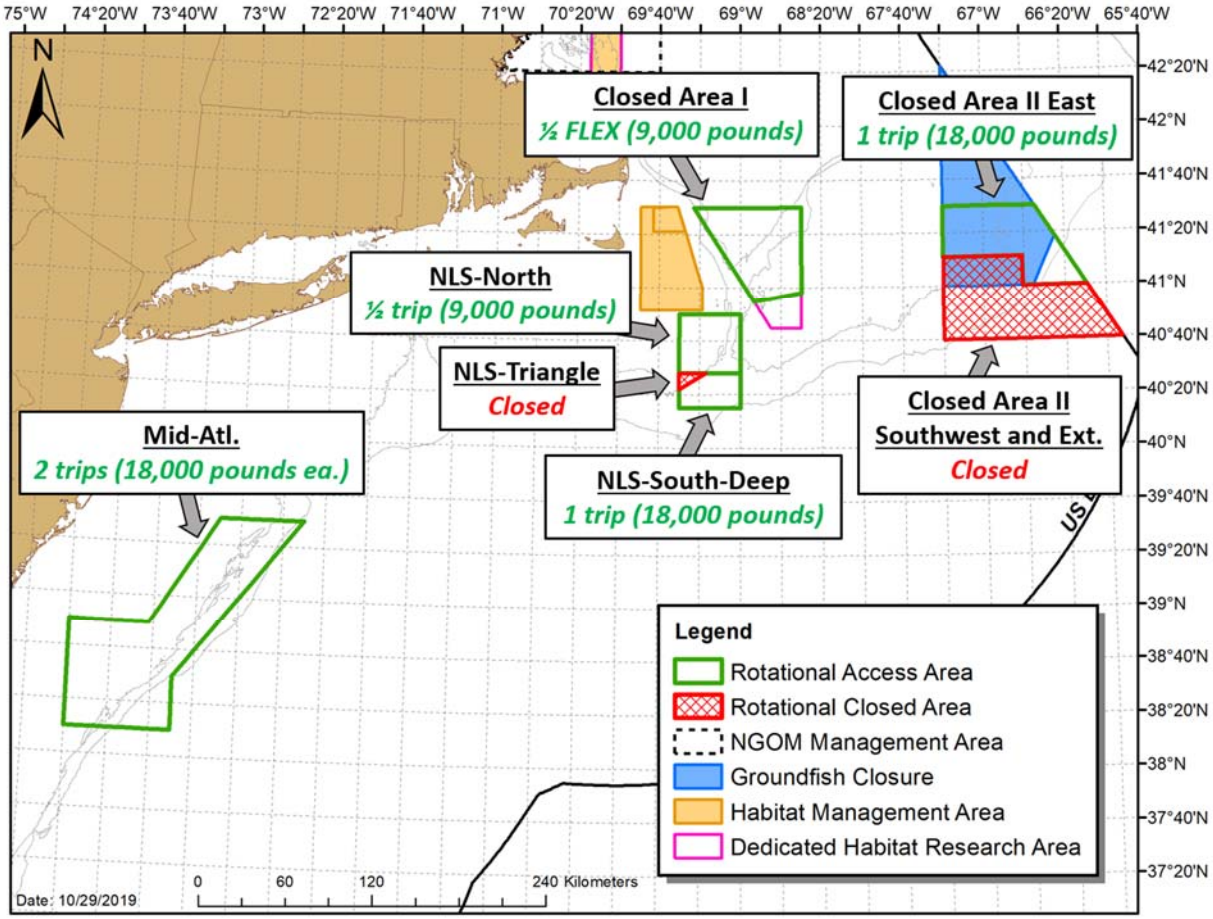


Table 14 – Coordinates of the continuous CAII-Southwest and CAII-Extension closure proposed under Alternative 3.

Point	Latitude	Longitude
1	41° 11' 0" N	67° 20' 0" W
2	41° 11' 0" N	66° 41' 0" W
3	41° 0' 0" N	66° 41' 0" W
4	41° 0' 0" N	(1)
5	40° 40' 0" N	(1)
6	40° 40' 0" N	67° 20' 0" W
7	41° 11' 0" N	67° 20' 0" W
(1) intersection of US-Canada Maritime Boundary		

4.3.3.1 Sub-Option 1 – Open area fishing at F=0.27 (20 DAS)

Sub-Option 1 would set the FT LA DAS at 20, which is expected to result in an average open area fishing mortality rate of F=0.27 in open areas when the Closed Area II extension is closed. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 46,006,792 lbs.
- The LAGC IFQ APL (5.5%) would be 2,530,374 lbs. The LAGC IFQ only (5% of APL) would be set at 2,300,340 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,897,780 lbs.

4.3.3.2 Sub-Option 2 – Open area fishing at F=0.30 (22 DAS)

Sub-Option 2 would set the FT LA DAS at 22, which is expected to result in an average open area fishing mortality rate of F=0.30 in open areas when the Closed Area II extension is closed. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 47,671,282 lbs.
- The LAGC IFQ APL (5.5%) would be 2,621,921 lbs. The LAGC IFQ only (5% of APL) would be set at 2,383,564 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,966,440 lbs.

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4.3.3.3 Sub-Option 3 – Open area fishing at F=0.33 (24 DAS)

Sub-Option 3 would set the FT LA DAS at 24, which is expected to result in an average open area fishing mortality rate of F=0.33 in open areas when the Closed Area II extension is closed. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 49,318,135 lbs.
- The LAGC IFQ APL (5.5%) would be 2,712,497 lbs. The LAGC IFQ only (5% of APL) would be set at 2,465,907 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 2,034,373 lbs.

Rationale: As a response to the large year class of scallops observed in and around CAII AA in 2019, this alternative is considering modifications to the traditional CAII AA boundary which will focus fishery effort in the eastern portion of the area (i.e. CAII-Southeast) and the western portion of the area (i.e. CAII-Southwest) will be closed to scallop fishing for the entire year (Map 4). This option also closes the Closed Area II extension to protect small scallops. The eastern boundary of CAII AA would be extended east to the Hague Line to encompass the large scallops just outside of the traditional CAII boundary. The majority of scallops in the eastern portion of CAII AA will be exploitable and are anticipated to have high yield, whereas the western portion of the area is mostly home to the large set of 2-year-old scallops that have not yet recruited to the fishery.

Modifications to rotational boundaries in the Nantucket Lightship region are intended to optimize yield in this part of the resource. Expanding the NLS-North boundary to encompass the shallow portion of the former NLS-South would increase the biomass of adult scallops in the NLS-North and improve this fishing opportunity in FY2020. Adjusting the NLS-South boundary around the dense aggregation of slow-growing scallops is intended to focus fishing effort on the large year class of scallops in this area that will be 8 years old in FY2020. Expanding the NLS-South boundary southward by 5' will expand the area and provide vessels more room to fish considering that the scallops are relatively concentrated there. The NLS-Triangle closure comprises a small area with low scallop densities that could be used for research purposes in the absence of fishing. Establishment of the NLS-Triangle does not bind the Council to facilitating or supporting research in this area in any way.

The NLS-Hatchet area remained closed following the partial approval of OHA2 and the removal of the Nantucket Lightship groundfish closed area because there was no survey scallop survey or fishery data to inform potential fishing effort or other impacts from re-opening the area. This area is outside of the scallop dredge survey strata and outside of the projection model (SAMS) domain and is not known to be productive scallop bottom. A 2018 survey of the area using the HabCam v3 towed vehicle did not detect any scallops larger than 35mm in this area. Since the area has been recently surveyed, and no scallops were detected, it is highly unlikely that the area would be fished.

4.3.4 Alternative 4 – Six Access Area Trips, Closed Area II-ext and part of the Southern Flank closed to open bottom fishing

If the Council selects Alternative 4 as preferred, it will also need to select a DAS sub-option.

Alternative 4 would allocate a total of six access area trips, four would be 18,000 pounds allocations, along with two ½ trips (9,000 pound allocations). Access areas open to the fishery under this scenario would be: The Mid-Atlantic Access Area (2 FT LA trips), Closed Area II Access Area (1 FT LA trip), Closed Area I Access Area (1/2 FT LA FLEX trip), and the Nantucket Lightship North Access Area (1/2 FT LA trips), and the Nantucket Lightship South Deep Access Area (1 FT LA trip).

In the open bottom (areas outside of rotational management areas and closures), the fishery would not have access to CAII-Southwest, CAII-Extension, or a portion of the southern flank (Map 6); coordinates of the proposed "Southeast Part" closure are provided in Table 15. In all alternatives, the Nantucket Lightship West area, which was an access area in FY 2018 and FY 2019 would be open bottom.

Within the Nantucket Lightship region, boundaries for the NLS-North would be expanded south to encompass part of the NLS-S-Shallow and the boundary for the NLS-South would shift to focus around the dense aggregations of slow-growing scallops in the deeper water (i.e. 70 m depth and greater). The NLS-South boundary was also expanded south by 5'. Alternative 3, as well as Alternatives 2 and 4, would establish a small area between the NLS-North and NLS-South, designated as the "Nantucket Lightship Triangle" (NLS-Triangle), which would be closed to the fishery for FY2020. Coordinates for the proposed NLS-Triangle closure are provided in Table 13. The Nantucket Lightship Hatchet area, which remained closed as a rotational management area following the partial approval of OHA2 would become open bottom under this option. The Nantucket Lightship Hatchet was the remainder of the original Nantucket Lightship Groundfish Closure that did not overlap with scallop access areas.

The specific allocations associated with Alternative 4:

- The FY2020 Annual Projected Landings (APL) for this alternative are 46.7 million pounds (open area F=0.30, 20 DAS), 48.2 million pounds (open area F=0.34, 22 DAS), or 49.7 million pounds (open area F=0.38, 24 DAS) before set-asides are accounted for (i.e. RSA, observer).
- Each full-time limited access vessel would be allocated a total of 90,000 access area pounds (see Table 11). The FT LA trip limit would be set at 18,000 lbs in all available access areas: Closed Area II, Closed Area I, the Mid-Atlantic Access Area, Nantucket Lightship South Deep, and Nantucket Lightship North.
- The FLEX trip allocation (9,000 pounds) could be fished only within Closed Area I or the MAAA (see Table 11). This option would allow LA vessels to more broadly distribute effort if Closed Area I biomass projections are overly optimistic.
- Access area allocations would be set at 36,000 pounds for PT LA vessels. LA PT trip limit would be set at 12,000 pounds, and PT vessels would receive two (2) MAAA trips and one (1) Closed Area II trip.
- The LAGC incidental target TAC would be set at 50,000 lbs.

- Allocated Limited Access access area trips would be available in the same access areas defined by Framework 32 for the first 60 days of FY2021, even if the area is scheduled to close in FY 2021. Vessels planning to fish 2020 access area allocation must start their trip (i.e., position on their VMS unit seaward of the demarcation line) by 23:59 on May 30, 2021. For example, trips allocated to the NLS-S-Deep Access Area could only be fished in the access area boundary defined by FW32 in the first 60 days of FY2021.
- FY2021 default measures under Alternative 2 would allocate FT LA vessels one (1) 18,000 pound access area trip to the Mid-Atlantic Access Area as defined by Framework 32. PT LA vessels would be allocated one 7,200 pound access area trip to the Mid-Atlantic Access Area, as defined by Framework 32. The LAGC IFQ component would also receive access area trips to the MAAA, proportional to 5.5% of the default access area allocations to each area (trips to the MAAA). The LAGC IFQ and LA DAS allocations would be set at 75% of the 2020 allocations.

Map 6 – Spatial management under Alternative 4 (Southeast Part closure).

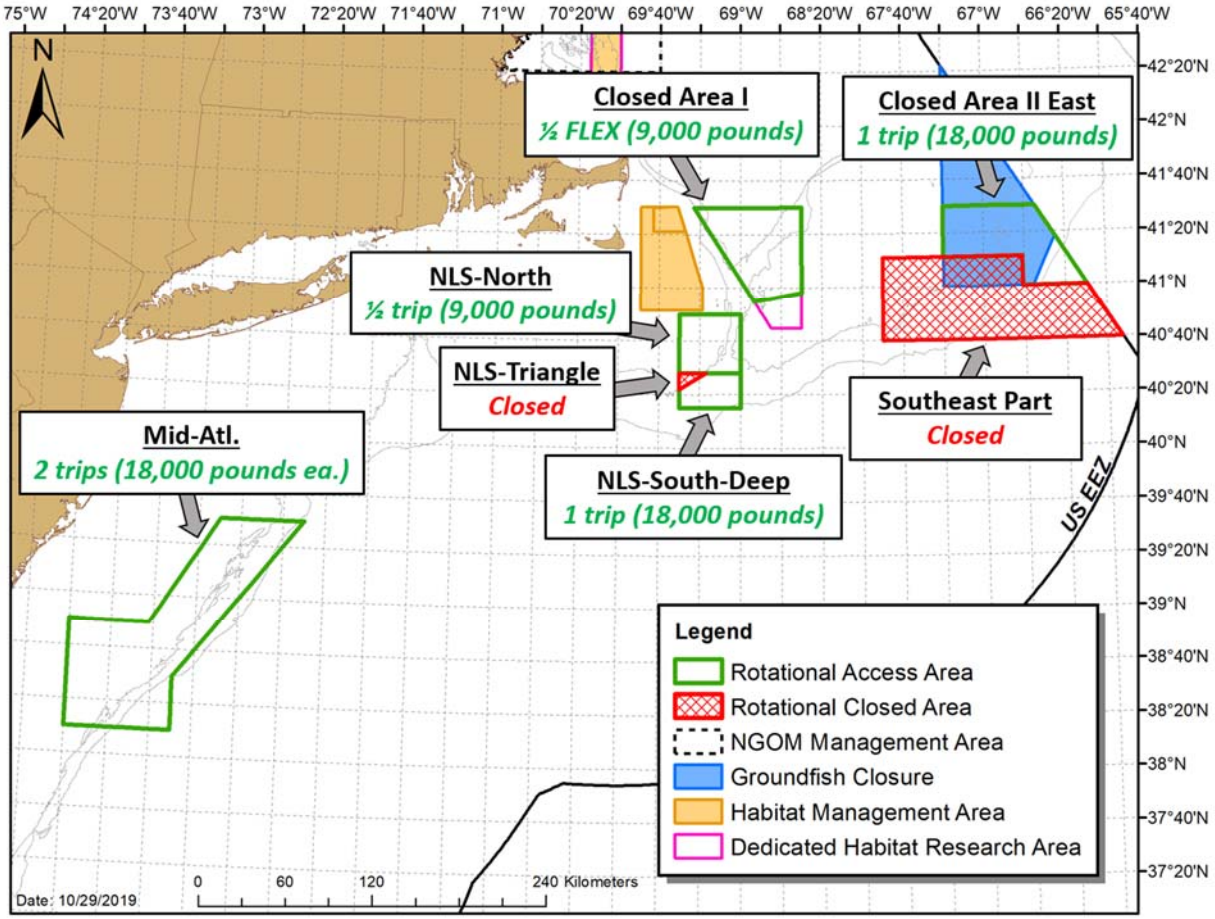


Table 15 – Coordinates of the "Southeast Part" closure proposed under Alternative 4. Note that coordinates represent a continuous boundary of CAII-Southwest, CAII-Extension, and part of the Southern Flank.

Point	Latitude	Longitude
1	41° 11' 0" N	67° 50' 0" W
2	41° 11' 0" N	66° 41' 0" W
3	41° 0' 0" N	66° 41' 0" W
4	41° 0' 0" N	(1)
5	40° 40' 0" N	(1)
6	40° 40' 0" N	67° 50' 0" W
7	41° 11' 0" N	67° 50' 0" W
(1) intersection of US-Canada Maritime Boundary		

4.3.4.1 Sub-Option 1 – Open area fishing at F=0.30 (20 DAS)

Sub-Option 1 would set the FT LA DAS at 20, which is expected to result in an average open area fishing mortality rate of F=0.30 in open areas when the Closed Area II extension and the southern flank east are closed. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 44,393,008 lbs.
- The LAGC IFQ APL (5.5%) would be 2,441,615 lbs. The LAGC IFQ only (5% of APL) would be set at 2,219,650 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,831,212 lbs.

4.3.4.2 Sub-Option 2 – Open area fishing at F=0.34 (22 DAS)

Sub-Option 2 would set the FT LA DAS at 22, which is expected to result in an average open area fishing mortality rate of F=0.34 in open areas when the Closed Area II extension and the southern flank east are closed. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 45,907,584 lbs.
- The LAGC IFQ APL (5.5%) would be 2,524,917 lbs. The LAGC IFQ only (5% of APL) would be set at 2,295,379 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,893,688 lbs.

4.3.4.3 Sub-Option 3 – Open area fishing at F=0.38 (24 DAS)

Sub-Option 2 would set the FT LA DAS at 24, which is expected to result in an average open area fishing mortality rate of F=0.38 in open areas when the Closed Area II extension and the southern flank east are closed. The specific allocations associated with Alternative 2 would be:

- The APL after set-asides are removed would be 47,395,704 lbs.
- The LAGC IFQ APL (5.5%) would be 2,606,764 lbs. The LAGC IFQ only (5% of APL) would be set at 2,369,785 lbs. The FY 2021 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2020 value, which would be 1,955,073 lbs.

Rationale: As a response to the large year class of scallops observed in and around CAII AA in 2019, this alternative is considering modifications to the traditional CAII AA boundary which will focus fishery effort in the eastern portion of the area (i.e. CAII-Southeast) and the western portion of the area (i.e. CAII-Southwest) will be closed to scallop fishing for the entire year (Map 4). This option also closes the Closed Area II extension and part of the Southern Flank to protect small scallops. The eastern boundary of CAII AA would be extended east to the Hague Line to encompass the large scallops just outside of the traditional CAII boundary. The majority of scallops in the eastern portion of CAII AA will be exploitable and are anticipated to have high yield, whereas the western portion of the area is mostly home to the large set of 2-year-old scallops that have not yet recruited to the fishery.

Modifications to rotational boundaries in the Nantucket Lightship region are intended to optimize yield in this part of the resource. Expanding the NLS-North boundary to encompass the shallow portion of the former NLS-South would increase the biomass of adult scallops in the NLS-North and improve this fishing opportunity in FY2020. Adjusting the NLS-South boundary around the dense aggregation of slow-growing scallops is intended to focus fishing effort on the large year class of scallops in this area that will be 8 years old in FY2020. Expanding the NLS-South boundary southward by 5' will expand the area and provide vessels more room to fish considering that the scallops are relatively concentrated there. The NLS-Triangle closure comprises a small area with low scallop densities that could be used for research purposes in the absence of fishing. Establishment of the NLS-Triangle does not bind the Council to facilitating or supporting research in this area in any way.

The NLS-Hatchet area remained closed following the partial approval of OHA2 and the removal of the Nantucket Lightship groundfish closed area because there was no survey scallop survey or fishery data to inform potential fishing effort or other impacts from re-opening the area. This area is outside of the scallop dredge survey strata and outside of the projection model (SAMS) domain and is not known to be productive scallop bottom. A 2018 survey of the area using the HabCam v3 towed vehicle did not detect any scallops larger than 35mm in this area. Since the area has been recently surveyed, and no scallops were detected, it is highly unlikely that the area would be fished

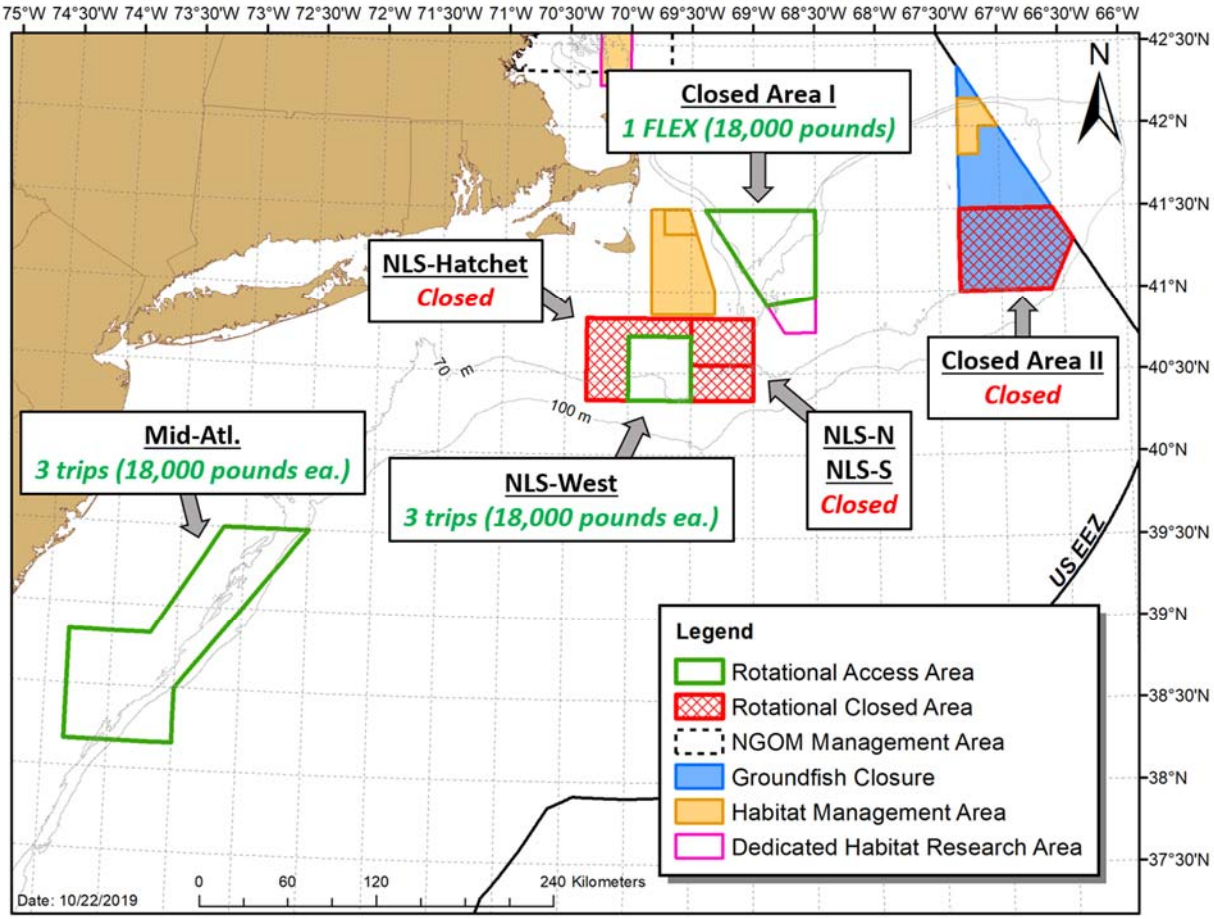
4.3.5 Alternative 5 – Status Quo Allocations from Framework 30

The allocations and spatial management measures that were approved for FY 2019 though Framework 30 are presented for a "status quo" comparison with updated spatial management alternatives (Section 4.3.2, Section 4.3.3, and Section 4.3.4). The impact analyses in this action (Section 7.0) include the impacts of "no change" to the spatial management scenarios because it is a more realistic comparison than to No Action (Section 4.3.1), which only captures trade-offs between the default measures approved in FW30 (i.e. partial allocations). A description of the Framework 30 preferred measures is provided in the alternatives section of Framework 32 to provide continuity and context for the reader.

In Framework 32, the Status Quo run that is presented deviates from the modeling assumptions made in FW30 due to substantial changes in scallop biomass. Therefore, Status Quo should not be considered a perfect comparison to the FY2019 approach to spatial management. For example, Framework 30 allocated three FT LA trips with 18,000 pound allocations to the Nantucket Lightship West for FY2019, and anticipated that fishing options would be available in this area for FY2020. In contrast, updated forward projections of exploitable biomass in the NLS-West suggests that this area could not support one FT LA trip in FY 2020. Therefore, the model fishes this area at an F=2.0, and then assumes harvesters will not attempt to continue fishing the area. These assumptions have impacts on estimates of fishing mortality and swept area and are discussed in Section 6 of this action. Framework 30 allocated full-time limited access vessels a total of seven access area trips with an 18,000-pound trip limit, or a total access area allocation of 126,000 pounds per vessel. The Council allocated three (3) trips to the Nantucket Lightship-West, three (3) trips to the Mid-Atlantic Access Area, and one (1) Closed Area I FLEX trip (Map 7). The Flex trip allocation (18,000 pounds) could be fished within Closed Area I, the Nantucket Lightship-West, and(or) the Mid-Atlantic Access Area. This option was developed and selected so that LA vessels could redirect effort outside of Closed Area I if the biomass projection for this area were overly optimistic.

Fishing the open bottom at an F=0.23 would result in an allocation of 18 DAS in FY2020 (vs. 24 DAS in FY 2019). Applying status quo spatial management in FY 2020 would be expected to result in total APL of 44.8 million pounds, which is roughly 28% less than the 62.5 million pound APL associates with the same spatial management and open area F applied for FY 2019.

Map 7 – Status Quo spatial management (FW30 allocations for FY2019).



4.4 Action 4 - Access Area Trip Allocations to the LAGC IFQ Component

4.4.1 Alternative 1 – No Action (Default measures from FW30)

Alternative 1 would set LAGC IFQ access area trips at 571 trips to the Mid-Atlantic Access Area, and 571 trips to Nantucket Lightship West, which is the number of trips specified through default measures in Framework 30. As noted above, 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. Instead, a maximum number of trips is identified for each area and once that limit is reached, the area closes to all LAGC IFQ vessels for the remainder of the fishing year.

Rationale: Framework 29 specified a set number of LAGC IFQ access area trips in default measures.

4.4.2 Alternative 2 – LAGC IFQ Access Area Trips

Under Alternative 2, the number of total access area trips allocated to the LAGC IFQ component under this option would be dependent upon the APL value in each specification run (Section 1.1), and is driven by the number of access area trips that are allocated to the FT LA component. When 5.5% is applied to the FT LA access area allocations for FY2020 (i.e. four 18,000-pound allocations and two 9,000-pound allocations), the LAGC IFQ component would receive 2,855 trips. This method has been used in previous actions.

Alternative 2 would allocate LAGC IFQ access are trips proportional to the LA allocations in each access area (Table 16). For alternatives in Section 4.3 that allocate a FLEX trip to Closed Area I, this alternative would allocate LAGC IFQ trips proportionally to the LA potential harvest in Closed Area I. The LAGC IFQ access area trip allocations for FY 2020 would be based on the Council's preferred alternative is Section 1.1. FY 2021 default LAGC access area allocations are specified in Section 1.1.

Rationale: Under Alternative 2, allocations would follow the 94.5% and 5.5% split, as specified in Amendment 11. This approach leads to more opportunity for the LAGC IFQ to harvest scallops from access areas than under No Action.

Table 16 - Potential LAGC IFQ Access Area Trips by Area for FY 2020.

Specs. Alt.	Distribution of CAII trips	LAGC IFQ Trips	CAI	NLS-North	NLS-S-deep	MAAA
		Total Trips	Allocated LAGC Trips to Each Access Area			
Alt. 1	No Action	1,142				
A2, Sub-Opt. 1	MAAA, NLS-N, CAI	2,855	476	476	571	1,333
A2, Sub-Opt. 2	NLS-N, CAI	2,855	571	571	571	1,142
A2, Sub-Opt. 3	NLS-N, NLS-S-deep, CAI	2,855	476	476	761	1,142

4.4.2.1 Sub-Option 1: Distribute Closed Area II Access Area Allocation to the MAAA, CAI, and NLS-N Access Areas

Sub-Option 1 would distribute the LAGC IFQ Closed Area II trip allocation evenly across Closed Area I, the Nantucket Lightship North, and the Mid-Atlantic Access Area, in addition to the baseline trip allocation for these respective areas. As shown in Table 16, this would result in 476 LAGC access areas trips to Closed Area I and the Nantucket Lightship North, and 1,333 trips to the MAAA. There would be 571 trips available in the NLS-S-deep access area.

Rationale: The Closed Area II LAGC IFQ trip allocation would be distributed to Georges Bank and the Mid-Atlantic access areas, increasing access area fishing opportunities across both regions of the fishery.

4.4.2.2 Sub-Option 2: Distribute Closed Area II Access Area Allocation to CAI and NLS-N Access Areas

Sub-Option 2 would distribute the LAGC IFQ Closed Area II trip allocation to Closed Area I and the Nantucket Lightship North. As shown in Table 16, this would result in 571 LAGC access areas trips to Closed Area I, 571 LAGC access area trips to the Nantucket Lightship North, and 1,142 LAGC access area trips to the MAAA. There would be 571 trips available in the NLS-S-deep access area.

Rationale: The Closed Area II LAGC IFQ trip allocation would be distributed to Georges Bank access areas. Since Closed Area II is considered part of the LAGC IFQ's Georges Bank share of access allocation, this option would keep LAGC IFQ trips on Georges Bank proportional to the total FT LA access area allocation for Georges Bank.

4.4.2.3 Sub-Option 3: Distribute Closed Area II Access Area Allocation to CAI, NLS-N, and NLS-S-deep Access Areas

Sub-Option 3 would distribute the LAGC IFQ Closed Area II allocation evenly across Closed Area I, the Nantucket Lightship North, and the Nantucket Lightship South-Deep Access Areas. As shown in Table 16, this would result in 476 LAGC access areas trips to Closed Area I, 476 LAGC access area trips to the Nantucket Lightship North, 761 LAGC access area trips to the NLS-S-Deep Access Area, and 1,142 trips to the MAAA.

Rationale: The Closed Area II LAGC IFQ trip allocation would be distributed to Georges Bank access areas. Since Closed Area II is considered part of the LAGC IFQ's Georges Bank share of access allocation, this option would keep LAGC IFQ trips on GB proportional to the total FT LA access area allocation for Georges Bank.

4.5 Action 5 - Additional Measures to Reduce Fishery Impacts

4.5.1 RSA Compensation Fishing

4.5.1.1 Alternative 1 – No Action

Under No Action, Research Set-Aside (RSA) compensation fishing would be restricted to areas open to LA DAS fishing only. Vessels with RSA poundage would not be allowed to harvest RSA compensation from access areas.

4.5.1.2 Alternative 2 – Allow RSA compensation fishing in the Mid-Atlantic Access Area, with limited RSA compensation fishing in the NGOM Management Area.

Under Alternative 2, Research Set-Aside compensation fishing would be permitted only in the Mid-Atlantic Access Area, the Northern Gulf of Maine Management Area, and in open areas. RSA compensation fishing would not be permitted in the following access areas: Closed Area II Access Area, Closed Area I Access Area, Nantucket Lightship North Access Area, and the Nantucket Lightship South Deep Access Area.

RSA compensation fishing would be permitted in the NGOM management area, per NGOM alternatives as specified in Section 4.2. RSA compensation fishing would be permitted in the NGOM management

area up to the poundage specified in the Council's preferred alternative for the Limited Access share of the NOGM TAC, and only by vessels that are awarded NGOM RSA compensation pounds.

Rationale: This provision is intended to 1) Accurately account for scallop removals in the NGOM by restricting RSA compensation fishing to vessels that receive a portion of the LA TAC; 2) Facilitate access to high densities of scallops in the Mid-Atlantic Access Area; 3) reduce impacts on small scallops and flatfish in Closed Area II; 4) Reduce overall mortality in access areas where a full trip of 18,000 pounds was not allocated (i.e. Nantucket Lightship North and Closed Area I).

4.5.2 (PLACEHOLDER ONLY) Measures to Reduce Impacts on Georges Bank Yellowtail Flounder

See Document 3a for discussion.

4.6 CONSIDERED BUT REJECTED ALTERNATIVES

The Council did not consider any other alternatives besides those described above in Section 0.

5.0 AFFECTED ENVIRONMENT

5.1 INTRODUCTION

The Affected Environment is described in this action based on valued ecosystem components (VECs), including: target species, non-target species, predator species, physical environment and Essential Fish Habitat (EFH), protected resources, and human communities. VECs represent the resources, areas and human communities that may be affected by the alternatives under consideration in this amendment. VECs are the focus, since they are the "place" where the impacts of management actions occur.

5.2 ATLANTIC SEA SCALLOP RESOURCE

5.2.1 Stock Status

The sea scallop resource had a benchmark assessment (SARC 65) in 2018 (NEFSC 2018). Therefore, all of the data and models used to assess the stock were reviewed. The summary of the benchmark assessment can be found at: https://www.nefsc.noaa.gov/publications/crd/crd1808/

Overfishing is occurring if F is above F_{MSY}, and the stock is considered overfished if biomass is less than ½ B_{MSY}. SARC 65 updated reference points and increased F_{MSY} to 0.64 and increased B_{MSY} to 116,766 mt (½ B_{MSY} = 58,383 mt). SARC 65 concluded that the scallop stock is neither overfished nor did it experience overfishing in 2017 (i.e. the terminal year of the assessment).

Figure 2 - Whole stock estimates of biomass by region from SARC 65. The biomass target B_{MSY} is the black dotted line, and the overfished biomass threshold $B_{MSY}/2$ is the red dashed line.

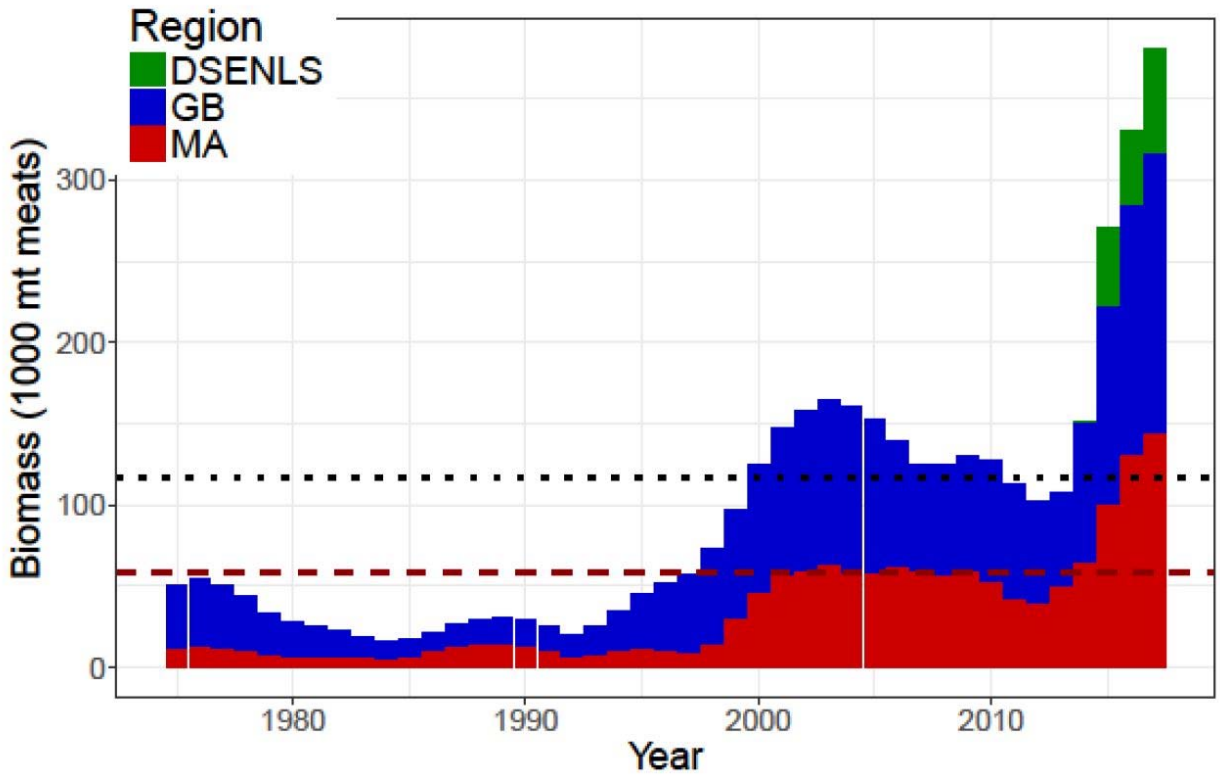
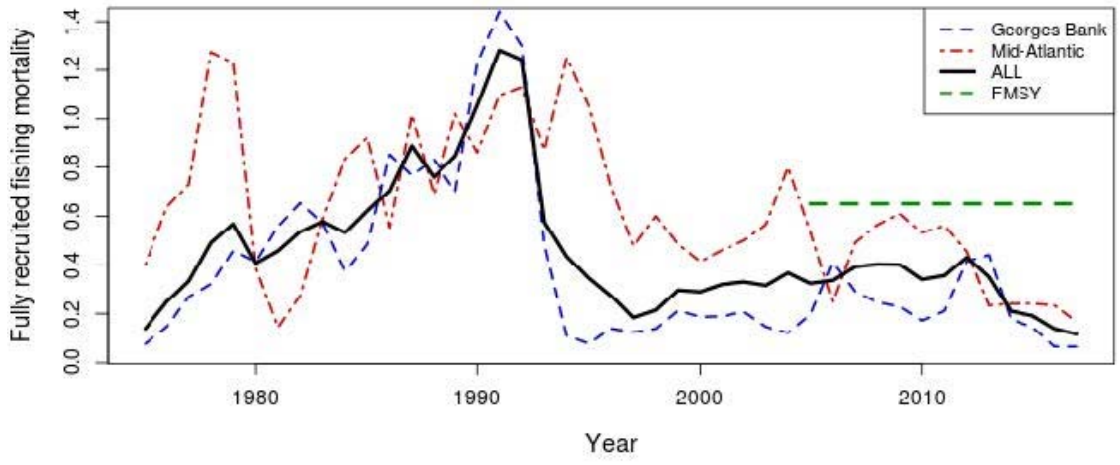


Figure 3 - Fully recruited annual fishing mortality rate for scallop from 1975 - 2017



Note that trends are different for partially recruited scallops because of changes in commercial size selectivity. SARC65 F_{MSY} (F=0.64) is shown with green dashed line for the most recent period; F_{MSY} would have been smaller in past years when selectivity was different.

Table 17 - 2017 Atlantic sea scallop stock status.

	Total 2017 Estimate	Stock Status Reference Points
Biomass (in 1000 mt)	317	½ B_{MSY} = 58,383
F	0.12 (SE of 0.01)	OFL = 0.64
In 2017, overfishing was not occurring, and the resource was not overfished.		

5.2.2 Northern Gulf of Maine

In 2019, the University of Maine and Maine Department of Marine Resources (DMR) conducted a dredge survey of the Northern Gulf of Maine and the portion of Stellwagen Bank directly south of the NGOM. The survey area covered Stellwagen Bank, southern Jeffreys Ledge, Ipswich Bay, and Platts Bank, as well as other areas off the coast of downeast Maine. Survey coverage was slightly different than the 2016 survey (i.e. next most recent UMaine/ME DMR dredge survey)—survey stations in the area of Mount Desert Island and on Fippennies Ledge were dropped, and the portion of Stellwagen Bank south of the NGOM was added in 2019. The 2019 dredge survey detected a high level of recruitment on Stellwagen Bank and to a lesser extent on Southern Jeffreys Ledge. Larger scallops (> 75 mm SH) were distributed across the southern extent of the survey domain and overall catch was lower in the northern extent (i.e. MSI, Platts Bank) relative to the southern extent. L-Fs for all survey areas estimated mean shell height to be 63 mm—this size distribution was driven by the extraordinarily high catches of < 55 mm scallops in Stellwagen Bank. Excluding catch from Stellwagen Bank, mean shell height across the survey area was ~110 mm. Based on known growth rates for Stellwagen Bank, most of the large year class observed there could be expected to reach approximately 75 mm in March 2020, over 101 mm by February 2021, and fully selective to the 4” ring by June 2021. There is direct overlap of the recruit class and larger year class

on Stellwagen Bank. Outside of Stellwagen Bank, the highest densities and most exploitable biomass were observed on southern Jeffreys Ledge. A comparison of estimates between the 2016 and 2019 surveys suggests that total biomass in the NGOM has decreased over time, but abundance has increased.

Table 18 - Biomass, exploitable biomass, and target TACs for Jeffreys Ledge survey area. Catch in mt.

	F=0.18			F=0.2			F=0.25		
Year	Bms	ExpBms	Land	Bms	ExpBms	Land	Bms	ExpBms	Land
2019	724	674		724	674		724	674	
2020	697	652	117.34	697	652	130.38	697	652	162.97
2021	520	495	89.13	511	486	97.21	488	464	116

Table 19 - Biomass, exploitable biomass, and target TACs for Ipswich Bay survey areas. Catch in mt.

	F=0.18			F=0.2			F=0.25		
Year	Bms	ExpBms	Land	Bms	ExpBms	Land	Bms	ExpBms	Land
2019	153	122		153	122		153	122	
2020	159	138	24.92	159	138	27.69	159	138	34.62
2021	129	120	21.52	126	117	23.5	121	113	28.14

5.2.3 Summary of 2019 Surveys

The Atlantic sea scallop resource was surveyed by the following groups/methods in 2019: the Virginia Institute of Marine Science (VIMS) dredge survey of the Mid-Atlantic Bight, Nantucket Lightship Area, Closed Area I, and Closed Area II and surrounds; the University of Massachusetts Dartmouth School for Marine Science and Technology (SMAST) high-resolution drop camera survey of the Mid-Atlantic Bight, Nantucket Lightship, Closed Area I, the Great South Channel, and the Northern Flank of Georges Bank; the Coonamessett Farm Foundation (CFF) HabCam survey of the Nantucket Lightship, Closed Area II, and the Elephant Trunk; and the Northeast Fisheries Science Center (NEFSC) dredge survey of Georges Bank and HabCam survey of portions of Georges Bank and the Mid-Atlantic.

The survey information below is detailed at the spatial resolution of Scallop Area Management Simulation (SAMS model) areas. 2019 SAMS area boundaries are shown in Figure 4 for Georges Bank and Figure 5 for the Mid-Atlantic Bight.

Figure 4 – 2019 Georges Bank SAMS areas.

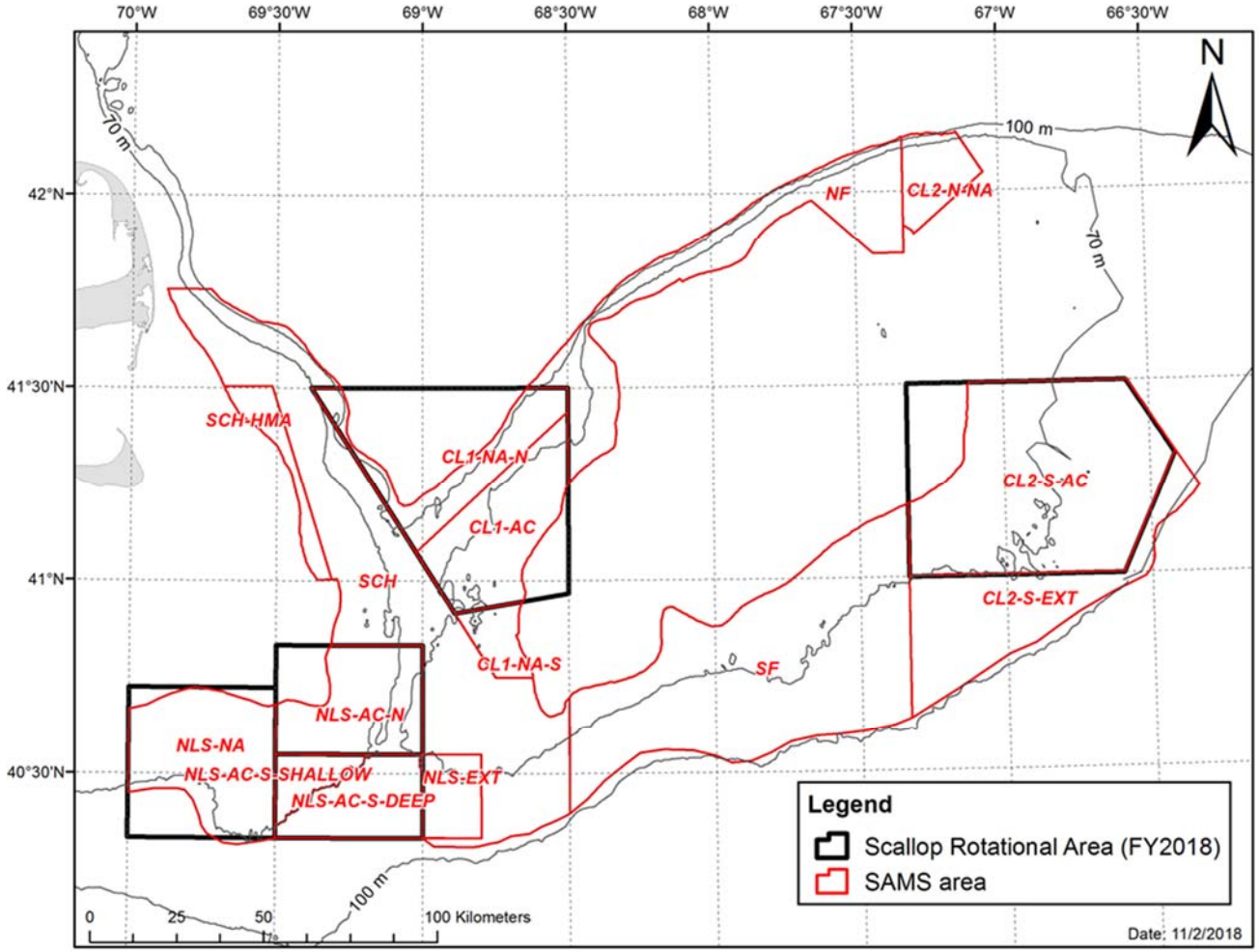
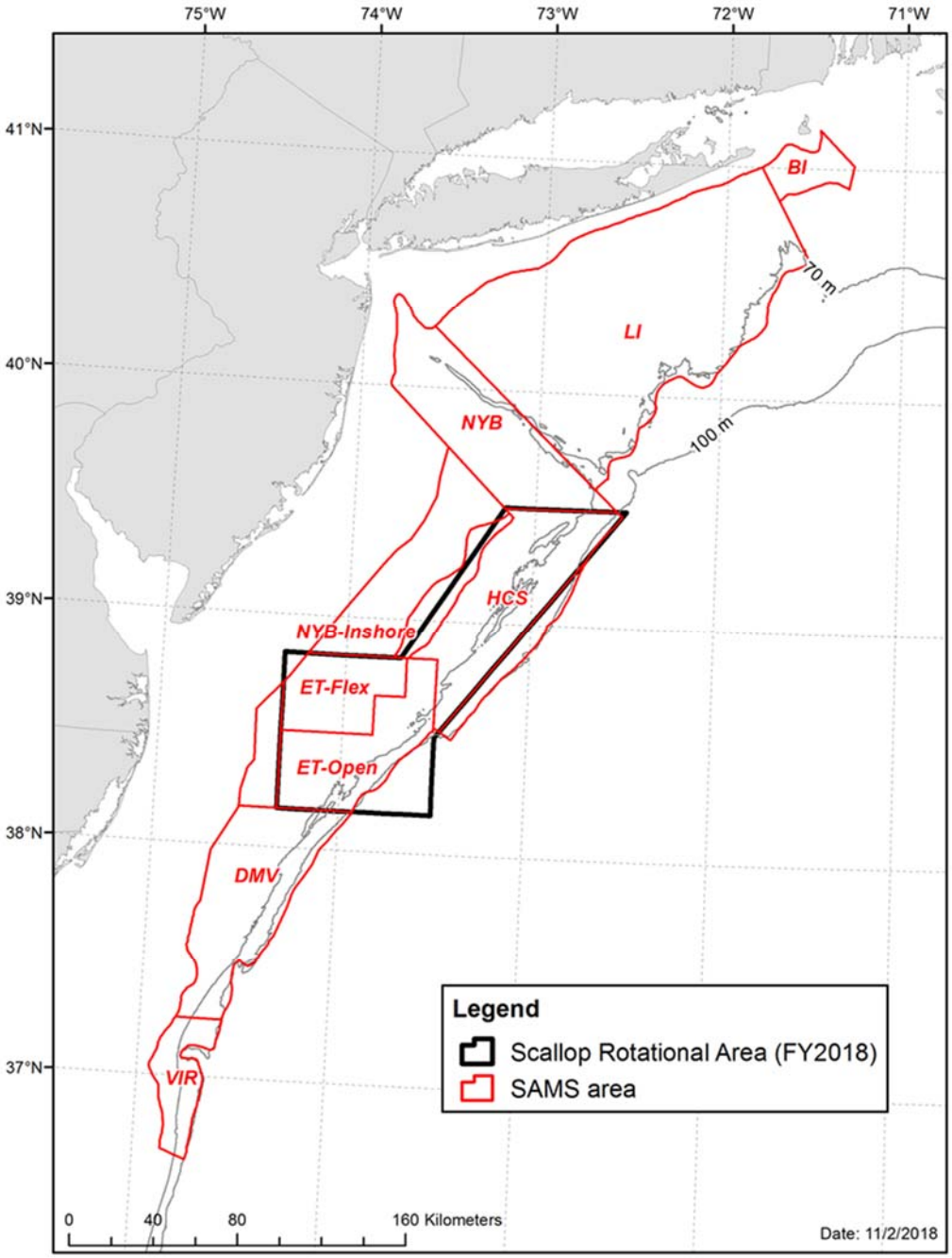


Figure 5 – 2019 Mid-Atlantic SAMS Areas.



5.2.3.1 VIMS dredge survey

The primary objective of the VIMS cooperative dredge survey was to assess the abundance and distribution of scallops in the Mid-Atlantic Bight (MAB), Nantucket Lightship (NLS), Closed Area I (CAI), and Closed Area II (CAII). Between early May and mid-July of 2019, VIMS completed 450 stations in the Mid-Atlantic Bight (MAB), 200 stations in the Closed Area I and Closed Area II survey domain, and 135 stations in the NLS. Area swept biomass estimates were calculated for each SAMS area using dredge selectivity parameters and shell height to meat weight (SHMW) parameter estimates from SARC 65 (2018).

Area swept biomass estimates were derived for each SAMS area using Yochum and DuPaul (2008) dredge selectivity parameters and length-weight parameters from SARC 65.

In the MAB survey domain, smaller scallops (35-75 mm shell height) were observed in open areas around the "Gully" (i.e. rim of the Hudson Canyon) as well as spread out in the LI, HCS, and ET SAMS areas. The majority of larger scallops (> 75 mm shell height) were observed in the SAMS areas of the Mid-Atlantic Access Area, primarily within the ET, ET-Flex, and HCS, and to a lesser extent in the LI SAMS area.

In the NLS survey domain, the majority of smaller scallops (i.e. 35-75 mm shell height) were observed in the NLS-S-deep SAMS area and consist of the 7-year-old class of animals that have experienced abnormally slow growth and have been tracked closely since 2015. Some larger scallops (i.e. > 75 mm shell height) were observed in the NLS-S-deep SAMS area, though a comparison of shell height to meat weight relationships suggest that these scallops have lower yield than similar sized scallops in other parts of the NLS. The majority of larger scallops have persisted in the NLS-West and the largest scallops were seen in the NLS-North, though densities in the NLS-North were lower than the other parts of the NLS and appeared to have a broader spatial distribution.

In the CAI and CAII survey domain, substantial recruitment was seen along the southern border of CAII AA/northern border of CAII-extension and to a lesser extent in the eastern portion of CAII AA. The recruitment observed in the CAII survey domain appeared to follow the 50-fathom depth contour. Larger scallops (> 75 mm shell height) were also seen along the 50-fathom contour, but were mostly concentrated in the eastern peak of the CAII AA. There was limited overlap of larger scallops and recruits in CAII AA. In CAI, some smaller (35-75 mm shell height) scallops were seen in the northwest corner of the CL1-sliver SAMS area, and the majority of large scallops in CAI were aggregated along the 50-fathom contour in the CL1-sliver SAMS area.

At least 15 scallops per station were sampled to inform shell height to meat weight (SHMW) relationships and meat quality observations. SHMW workups were used to estimate expanded length frequencies and included in a mixed effects model that estimates SHMW relationships for each SAMS area:

In the MAB, predicted SHMW relationships were similar across SAMS areas and less divergence was seen between SAMS areas compared to 2018. The DMV SAMS area had the smallest meat weight at a given height for the MAB survey domain.

For the NLS, predicted SHMW relationships appeared to be similar to 2018, with the NLS-S-deep SAMS area having the lowest SHMW relationship and only SAMS area within the NLS survey domain that was significantly different than the NLS-North.

In CAI AA, the SHMW relationship for CL1-Access SAMS area was significantly greater than the CL1-Sliver SAMS area, which is a change from 2018. Brief PDT discussion suggested the difference could be driven by a depth affect considering scallops in the CL1-Sliver SAMS area are mostly found in greater than 50 fathoms.

SHMW relationships were relatively consistent in the CAII survey domain, with the SHMW relationship for CL2-Access SAMS area being slightly greater than the CL2-Ext and SF SAMS areas.

In the MAB, L-F plots did not give a strong signal of very small scallops (< 20 mm) in the ET like the CFF HabCam survey reported (see below); however, the VIMS survey did not overlap directly (spatially or temporally) with where the HabCam identified these smaller animals and it is unlikely that the survey dredge would retain these scallops due to them being very small (i.e. roughly thumbnail size). Relative L-F distribution in the DMV SAMS area suggested some recruitment had occurred, but this is relative to the very low biomass for the DMV SAMS overall. The mean SH in the commercial dredge within the MAB survey domain was greater than 100 mm.

In the NLS survey domain, there was a slight bump of smaller scallops observed in the NLS-North which is consistent with recent years. In CAI, L-Fs from both the survey and commercial dredge suggested mean shell height of greater than 100 mm. L-F plots indicated that recruitment had occurred in all three SAMS areas within the CAII survey domain (i.e. CL2-Access, CL2-Ext, SF). Pictures from the VIMS survey in CAII suggested that some one-year-olds were captured in the dredge; however, the L-F distribution suggests that both one- and two-year-old's were present in CAII at the time of the 2019 survey.

A significant number of clappers were observed in survey stations in the NLS-West. The percentage of clappers to total scallop catch ranged from 1-26% and the L-F distribution of clappers and live scallops were very similar; it was suggested that this may be an indication of higher than expected discard mortality in the NLS-West, potentially as a result of high grading and(or) deck loading. .

5.2.3.2 SMAST drop camera survey

Between early May and mid-July of 2019, SMAST completed drop camera surveys in the MAB, NLS, CAI, Great South Channel, and Northern Flank. SMAST estimates of abundance, biomass, mean meat weight, and mean shell height were based on quadrat still images from the high-resolution digital still camera. SARC 65 SHMW parameter estimates were used in biomass and mean meat weight calculations, except for the NLS SAMS areas which used VIMS 2016-2019 SHMW parameter estimates.

Estimates of total biomass by SAMS area in the Georges Bank survey domain suggested a large biomass of older scallops in the CAII North HAPC. A substantial decrease in biomass was seen in CAI AA between the 2018 and 2019 drop camera surveys in this area. For Georges Bank, the bulk of biomass continues to be concentrated in the NLS, primarily in the NLS-S-deep and NLS-West. Higher densities seem to persist in CAI-Sliver as well as in the NLS-West.

There was a significant decline in biomass between the 2018 and 2019 survey of the NLS-West. Projections for this area for 2019 were around 40,000 mt, but the 2019 drop camera survey estimate was roughly 13,000 mt. Despite this decline in biomass, density estimates from other parts of the NLS- with scallops did not change much between 2018 and 2019. The similarity in density for areas with scallops in 2018 and 2019 could suggest that the decrease in biomass may not be driven by natural mortality, but rather from fishery removals and higher discard mortality.

An increase in biomass was seen in the NLS-S-deep between 2018 and 2019 which appears to be driven by some growth occurring over the past year (i.e. roughly 15 mm). A large decrease in density in the NLS-S-deep was observed between 2017 and 2018; however, density appeared to be similar between 2018 and 2019.

A set of smaller scallops were observed in the northwest peak of CAI, and the smaller animals observed in the GSC in 2018 have continued to grow and were estimated to be recruit size at the time of the 2019 survey. The recruits in the GSC do appear to have some overlap with larger scallops and fishing effort does appear to be happening close to the recruits.

In CAII North HAPC, the majority of scallops appear to be old and encrusted with epifauna. This area has typically been thought of as a refuge for larger seeding scallops; however, the 2019 survey did not indicate another year class coming into the resource meaning a downturn in biomass could be expected there in the future.

A comparison of CAI AA between 2017 and 2019 suggests a decline in density had occurred over time, though the 2019 estimate suggested that density is still exploitable.

The 2019 drop camera survey covered the entirety of the MAB and suggested similar findings as the VIMS dredge survey. A spattering of recruitment was observed in the SAMS areas adjacent to the Hudson Canyon which is typical for this area annually. Some pre-recruits (< 35 mm SH) were observed in the southern part of ET-Open. There were a lot of larger scallops observed in ET-Open despite there being little to no fishery activity there in FY2018.

5.2.3.3 CFF HabCam survey

The Coonamessett Farm Foundation surveyed the NLS, CAII and Souther Flank, and the Elephent Trunk using HabCam v3 in summer 2019. In CAII and the Southern Flank, pre-recruits (35-75 mm scallops) were observed broadly across the survey area. Observations of > 75 mm SH scallops suggested that strong recruitment had occurred in the southern portion of CAII AA, along the northern boundary of CAII-ext, and extending into the SF. Similar to other survey findings, larger animals appeared most prevalent in the eastern peak of CAII AA. A clear spatial break between the recruits and larger animals was not evident in CAII AA; however, larger scallops appear to be distributed farther east than the recruits. Though scallops < 20 mm cannot be accurately quantified, animals in this size range were observed patchily across the survey area.

In the NLS, there were no observations of high densities of incoming year classes. The majority of recruit-size scallops were observed in the NLS-S-deep SAMS area, though it was acknowledged that these are the slow growing 7-year-old animals that have been tracked, not actually recruits. Larger scallops (> 75 mm SH) were observed across the survey domain, though the highest densities in the NLS-West appear to be retracting over time. Scallops between 75 and 100 mm SH were highly concentrated in the NLS-West and NLS-S-deep, while > 100 mm SH animals were distributed widely across the NLS-N. A comparison of L-F in the NLS-West between 2018 and 2019 suggests that little to no growth occurred over the past year and that some growth was apparent in the NLS-S-deep. Similar to other survey findings, a substantial decrease in biomass was observed between 2018 and 2019 in the NLS-West while an increase was estimated for the NLS-S-deep.

In the ET survey area, high densities of < 20 mm scallops were concentrated along the northern border of the ET-Flex SAMS area. Densities of pre-recruits (35-75 mm SH) were generally low across the survey area. Some recruitment was observed in the southern extent of the ET-Open SAMS area, but at lower densities than what the SMAST drop camera observed in this area. Larger scallops (> 75 mm SH) were distributed across the area, with notably higher densities in the ET-Flex SAMS area. It was suggested that the HabCam biomass estimate for the ET (based on combined data from the CFF and NEFSC survey) were being driven mostly by the non-random NEFSC HabCam tow which focused on the high density aggregation in the ET-Flex.

5.2.3.4 NEFSC dredge and HabCam survey

The 2019 NEFSC sea scallop survey used HabCam v4 and a survey dredge to assess the sea scallop resource. In the ET, one-year-old pre-recruits were observed in the northern part of the area while the adult distribution was consistent with recent years in being highly concentrated in the ET-Flex area. Very low densities were observed in the DMV SAMS area. One concentrated high-density aggregation of larger animals appeared to be driving the biomass estimate in the HC SAMS area. No notable densities of

scallops were observed in the inshore-MAB SAMS areas. As noted in other surveys, some pre-recruits and recruits were observed in open areas around the southern rim of the Hudson Canyon, which is typically a productive area. Overall, very little recruitment was observed in the MAB aside from a small pulse in the HC and ET.

For Georges Bank, 105 dredge tows were completed and combined HabCam (i.e. NEFSC and CFF) efforts covered the NLS, CAII, CAII-ext, and SF. A moderately strong signal of pre-recruits (35-75 mm SH) were observed along the 50 fathom depth contour throughout the SF SAMS area and into CAII-ext and CAII AA. Two patches of larger scallops (> 75 mm SH) were observed in CAII AA, one that overlapped with the smaller year class and the other which was concentrated in the eastern portion of CAII AA. Similar to findings from other surveys, the majority of adult biomass on Georges Bank was concentrated in the NLS-West and NLS-S-deep, and to a lesser extent in CAII-North HAPC and the eastern portion of CAII AA. The dredge survey detected some pre-recruits around Pollock Rip (i.e. northwest of CAI AA) and also in southern CAII. Some recruitment was observed in the Channel which is typical for this area, while the most prevalent recruitment seen across Georges Bank was in the SF SAMS area.

A comparison of mean biomass across all surveys by SAMS area suggested that projections for 2019 (i.e. from FW30) were relatively close to what the 2019 surveys observed, with the exception of the NLS-West which saw a substantial decrease in biomass relative to the 2019 projection. Generally, estimates from optical and dredge surveys were relatively consistent in areas without very high density but dredge efficiency appears to still be an issue in the NLS-West and NLS-S-deep. Unlike in 2018, the ET-Flex dredge estimate did not appear to diverge as much from the optical surveys—it was suggested that this could be due to the efficiency issue occurring at only a few stations in the ET-Flex.

Figure 6 – Length frequencies by SAMS area from the Mid-Atlantic portions of the 2019 VIMS dredge survey.

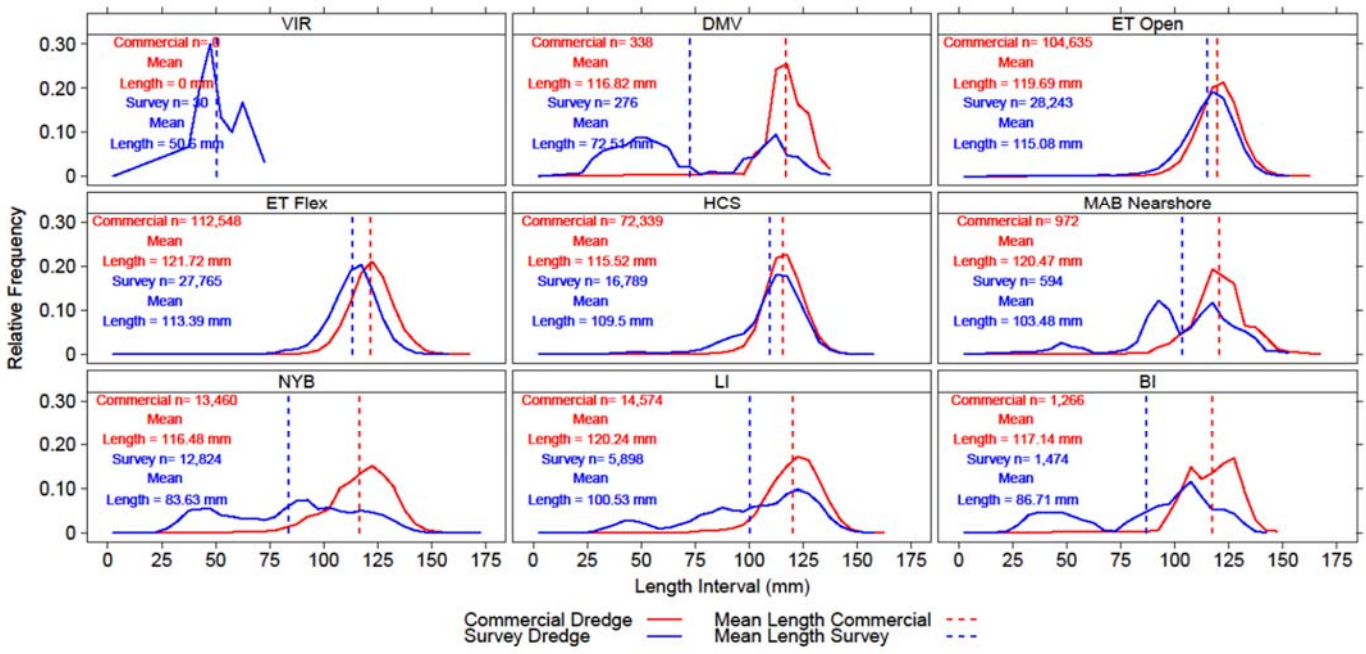


Figure 7 – Length frequencies by SAMS area from the NLS portion of the 2019 VIMS dredge survey.

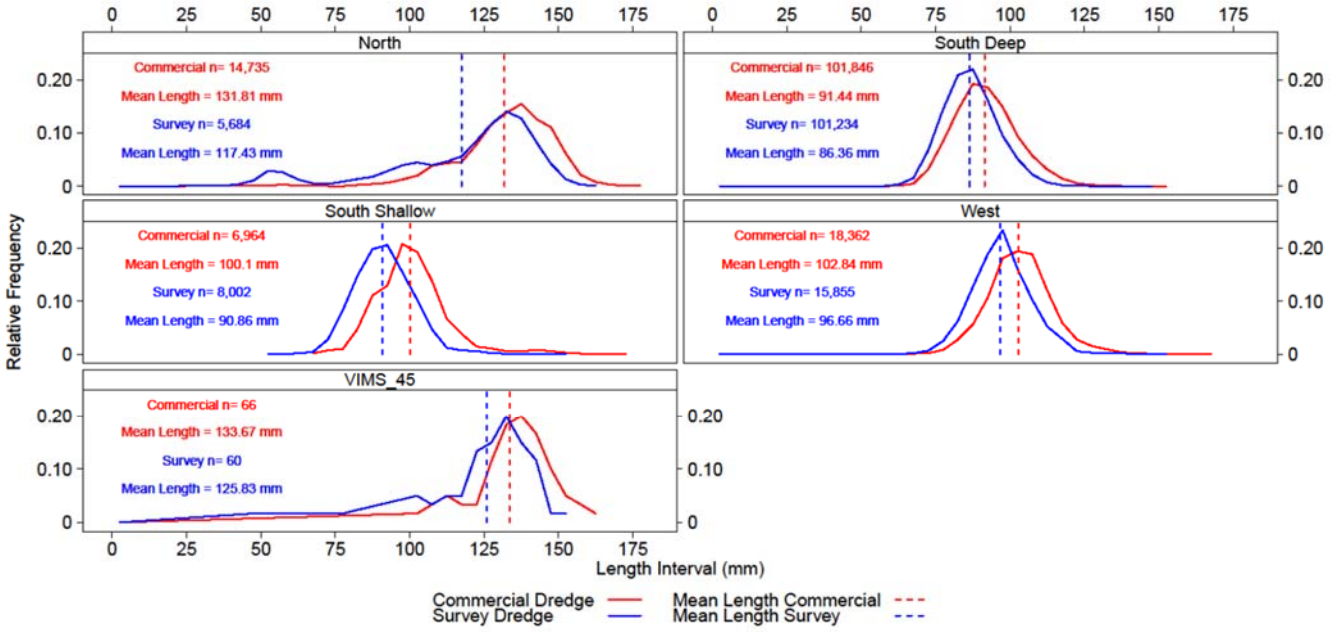


Figure 8 – Length frequencies by SAMS area from the CAII portion of the 2019 VIMS dredge survey.

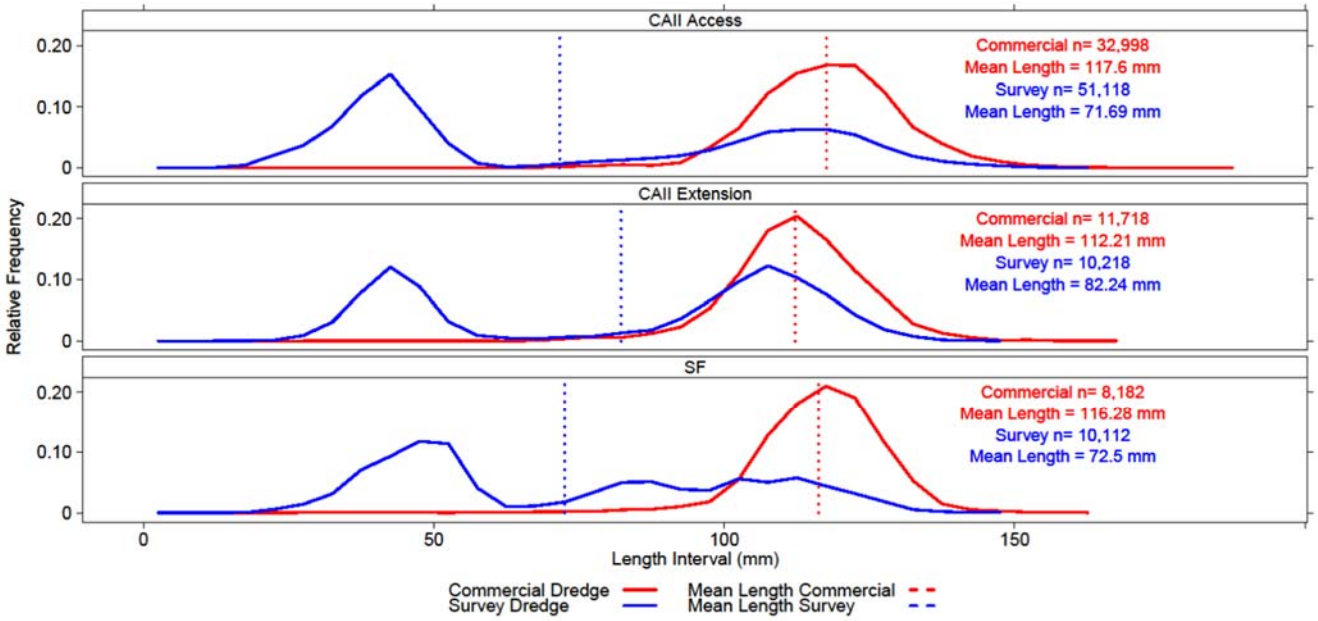


Figure 9 – Scallop catch per tow of 35-75 mm animals (left) and > 75 mm animals (right) from the 2019 VIMS survey dredge in the Mid-Atlantic Bight.

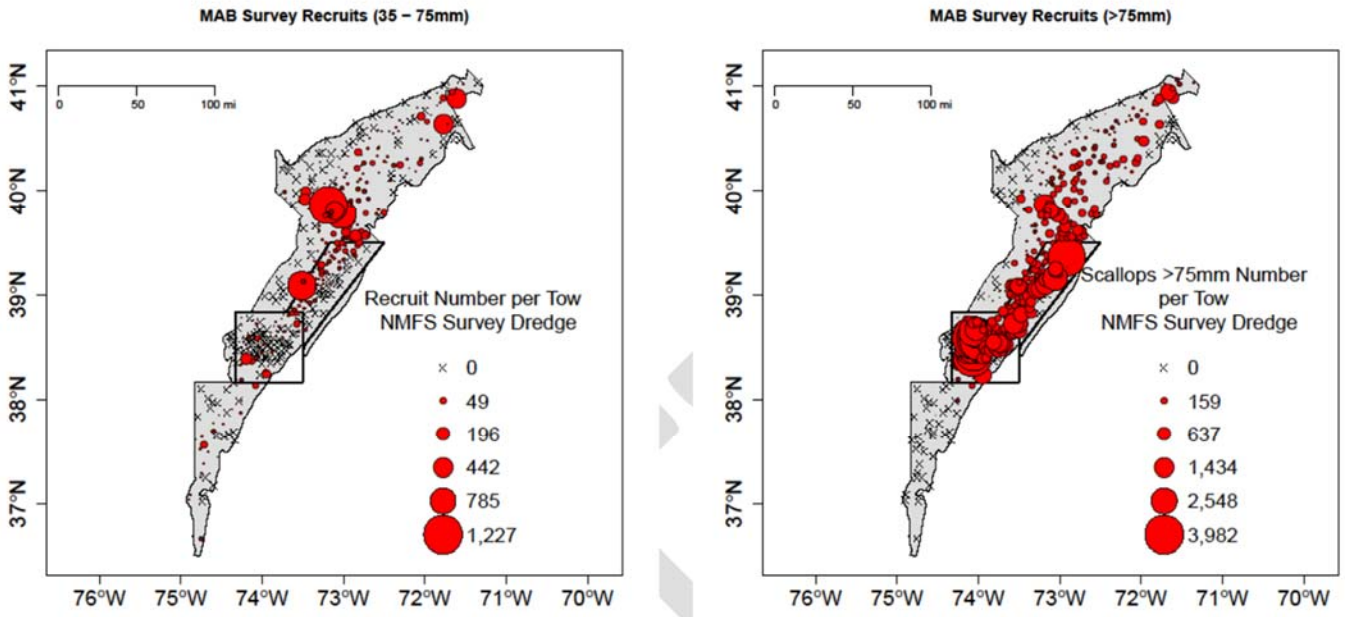


Figure 10 – Scallop catch per tow of 35-75 mm animals (left) and > 75 mm animals (right) from the 2019 VIMS survey dredge in the NLS.

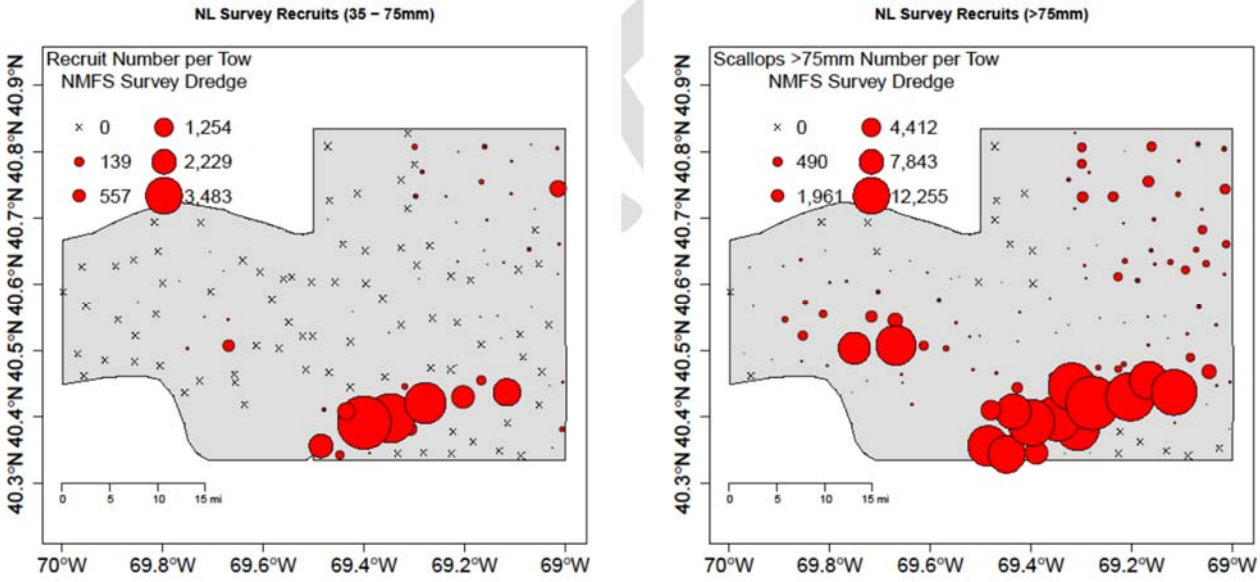


Figure 11 – Scallop catch per tow of < 35 mm animals (left) 35-75 mm animals (center) and > 75 mm animals (right) from the 2019 VIMS survey dredge in CAI and CAII.

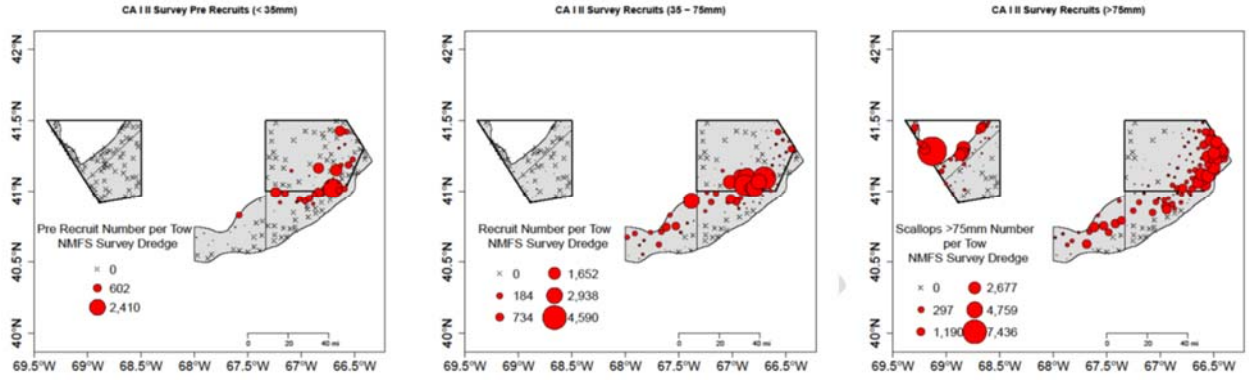


Figure 12 – Observed scallop density (m^{-2}) by the 2019 SMAST drop cam survey of the NLS, GSC, CAI, and NF.

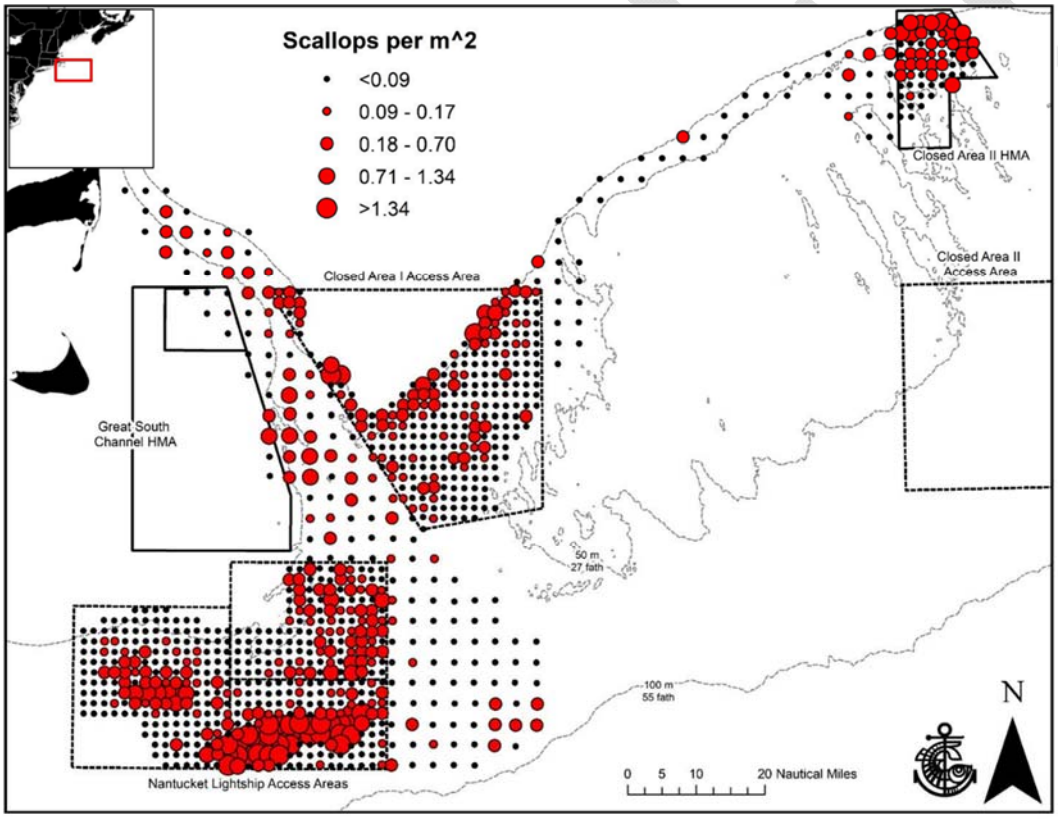


Figure 13 – Observed length frequencies from the 2017, 2018, and 2019 SMAST drop cam surveys of the NLS-S-Deep.

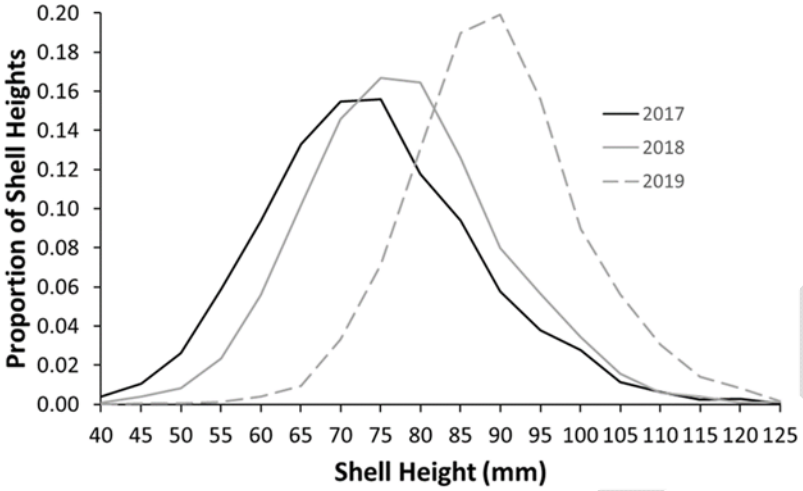


Figure 14 – Relative length frequencies from the 2019 CFF HabCam survey of the Nantucket Lightship by SAMS area.

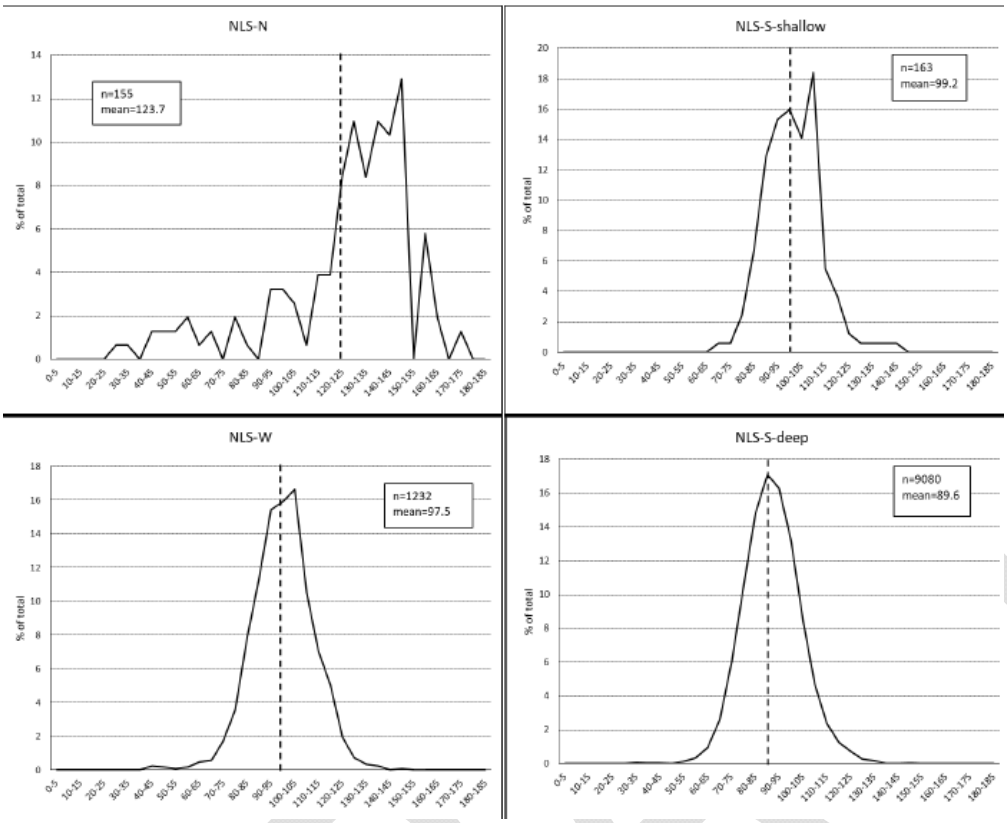


Figure 15 – Biomass estimate 'heat map' from the 2019 CFF HabCam survey of the Nantucket Lightship.

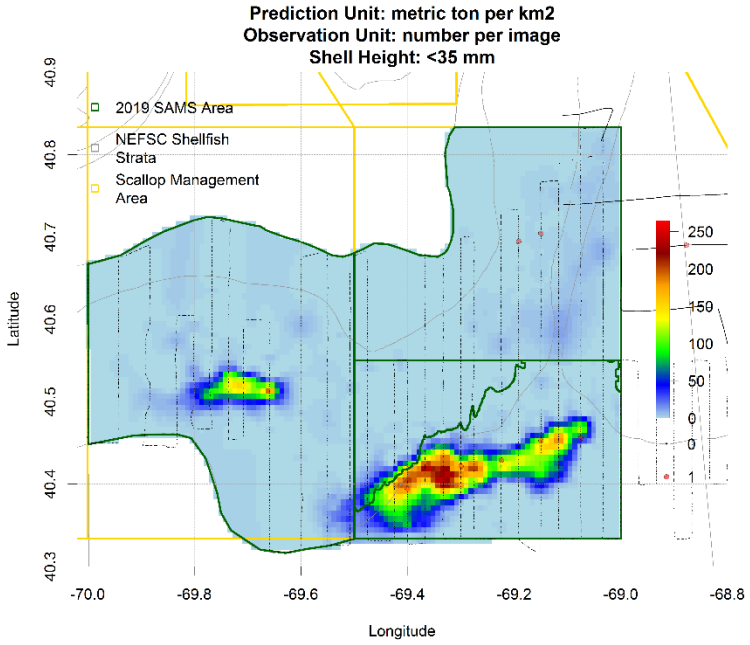
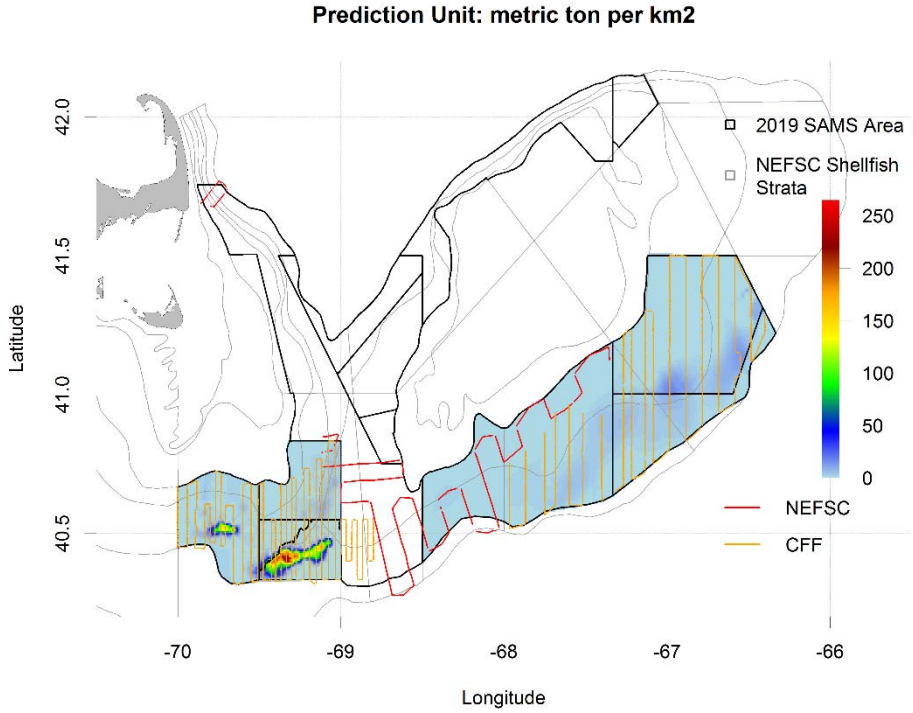


Figure 16 – 2019 HabCam survey tracks on Georges Bank conducted by NEFSC and CFF with resulting biomass estimates (predicted biomass, mt per km^2).



5.2.4 2019 Combined Survey Biomass Estimates

Results from all available surveys of the resource (see Section 5.2.2) were combined to estimate 2019 scallop biomass. Overall biomass is estimated by taking the mean biomass of all surveys by SAMS area. Survey groups applied the updated SARC 65 shell height to meat weight (SHMW) parameters when estimating 2019 biomass by SAMS area except for estimates in the NLS-S-deep, NLS-S-shallow, and NLS-N, and NLS-W SAMS areas. For these NLS SAMS areas, survey groups applied SHMW parameters estimates from VIMS survey dredge data collected between 2016 and 2019 to better estimate the unique characteristics of animals within the NLS. Combined 2019 biomass by SAMS area is shown in Table 20.

Table 20 – Biomass estimates from the 2019 surveys (i.e. Dredge, Drop Cam, Habcam) and the combined mean estimate of all surveys (i.e. Mean) by region and SAMS area. (September 10, 2019)

		Dredge				DropCam				Habcam				Mean			
Region	Subarea	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt
GB	CL1ACC	18.4	693	84	35.6	36	1049	203	29					27.1	871	73	32.1
GB	CL1NA	259.0	7857	912	29.5	154	3487	786	23					206.4	5672	401	27.5
GB	CL-2(N)	154.0	5778	2026	37.5	184.1	5,926	1,608	32					169.1	5852	862	34.6
GB	CL-2(S)	1671.0	20,689	1,129	15.4					1035	11710	356	11.3	1353.0	16200	592	12.0
GB	CL2Ext	312.1	5,568	566	17.4					653	6714	117	10.3	482.5	6141	289	12.7
GB	NLSAccN	81.5	3368	210	41.3	122	4,690	696	38.35	71	3066	379	42.9	91.6	3708	273	40.5
GB	NLSAccS-Shallow	117.6	1721	426	14.6	305	4655	3398	15.3	219	3420	9	15.6	213.8	3265	1142	15.3
GB	NLSAccS-Deep	3618.6	36608.8	1182	10.1	4839	49689	8919	10.3	3829	46060	871	12	4095.6	44119	3013	10.8
GB	NLS-W	600.8	10080.4	663	16.7	838	13,438	6,325	16.03	623	12575	3618	20.2	687.4	12031	2439	17.5
GB	NF	91.0	1585	735	17.5	57.2	1,008	372	18					74.1	1297	275	17.5
GB	GSC	296.0	7302	1354	24.7	439	6135	1000	14.0					367.6	6719	561	18.3
GB	GSC-45	1.7	82.57	29.51	49.5									1.7	83		49.5
GB	SF	686.8	12216.0	2127	17.8					1074	8514	188	7.9	880.4	10365	1068	11.8
GB	**TOTAL**	**7908.4**	**113549**	**3937**	**14.4**									**8650.3**	**116322**	**4391**	**13.4**
MAB	BI	94.9	1,515	254	17.3	47	1076	305	23	37	850	8	22.7	59.8	1147	132	19.2
MAB	LI	407.3	9,079	350	22.4	501	9417	962	19	570	12282	770	21.6	492.7	10259	427	20.8
MAB	NYB	537.8	7425	523	14.8	464	7032	1288	15	487	7091	330	14.6	496.4	7183	476	14.5
MAB	MA inshore	53.4	1265	181	23.7					26	1020	7	39.6	39.7	1143	91	28.8
MAB	HCSAA	380.4	8544	775	22.6	580	10185	783	18	762	18303	2273	24	574.1	12344	842	21.5
MAB	ET Open	592.0	15,105	897	25.8	888	18051	1187	20	634	17215	229	27.1	704.6	16790	502	23.8
MAB	ET Flex	523.6	13,529	1,174	25.5	771	19654	2711	25	778	24357	457	31.3	690.9	19180	996	27.8
MAB	DMV	20.3	203	43	10.5	89	374	111	4	47.0	599	58	12.8	52.2	392	44	7.5
MAB	VIR	4.2	14	1	3.0									4.2	14	1	3.3
MAB	**TOTAL**	**2614.0**	**56679**	**1811**	**21.7**					**3341.0**	**81717**	**2477**	**24.5**	**3114.6**	**68452**	**1546**	**22.0**
TotalOpen		**2505**	**46255**	**2687**	**219**					**2894**	**37070**	**224**	**130**	**2951**	**44741**	**1271**	**204**
TOTAL	**TOTAL**	**10522**	**170228**	**4333**	**16.2**					**3341**	**81717**	**2477**	**24.5**	**11765**	**184774**	**4655**	**15.7**

5.2.5 2020 Biomass Projections

SAMS Model Run (2020 projections using 2019 survey data):

1. Model configured the same as SARC 65, with 8 areas in MA and 12 in GB.
2. L_∞ in deep portion of NLS-S-deep was set to 110 mm to match observed growth (SARC 65).
3. L_∞ in the NLS-West was set to 119 mm to match observed growth.
4. ABC: F=0.51

Table 21 – 2020/2021 projected exploitable biomass by SAMS area, including ABC and OLF estimates.

SAMS Area	Proj 2020 Ebms	Land@F=0.51
HCS	7530	2591
Virginia	1	6
ET-Op	13708	4620
ET-Flex	13439	4499
DMV	298	158
NYB	5224	2357
LI	7199	2696
MAInsh+BI	2230	947
CLI-North	3151	1131
CLI-Middle	671	235
CLII-North	5089	1665
CLII-South	13196	4998
NLS-West	3658	1434
NLS-North	3273	1096
NLS-Sshal	2570	1376
NLS-Sdeep	18480	8234
CLII-Ext	5800	2484
GSC	4637	1662
Nflank	1272	500
Sflank	7104	2725
TotalOpen	33765	13535
Total	118530	45414

5.3 NON-TARGET SPECIES (BYCATCH)

Table 22 - Preliminary Outlook for 2020 Scallop Fishery flatfish sub-ACLs

	OFL	US ABC	Scallop ABC	Scallop ABC	Scallop ACL	2020 Bycatch Projections
Stock	**2020**	**2020**	**percentage**			
GB Yellowtail Flounder	unknown	120	16%	19	19	~23 mt
SNE/MA Yellowtail Flounder	31	22	projected	2	2	2-3 mt
Northern Windowpane Flounder	84	59	21%	12	12	30-34 mt
Southern Windowpane Flounder	568	426	36%	153	143	133-148 mt

5.4 PROTECTED SPECIES

The following protected species are found in the environment in which the sea scallop fishery is prosecuted. Several 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 are in Table 23 to facilitate consideration of the species most likely to interact with the scallop fishery relative to the preferred alternative.

Table 23 – 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, West Indies DPS (*Megaptera novaeangliae*)	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.*)[1]	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*)	Protected(MMPA)	No
Spotted dolphin (*Stenella frontalis*)	Protected(MMPA)	No
Striped dolphin (*Stenella coeruleoalba*)	Protected(MMPA)	No
Bottlenose dolphin (*Tursiops truncatus*)[2]	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*)	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean 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
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	Protected (ESA)	No
Northwest Atlantic Ocean DPS of Loggerhead Sea Turtle	Protected(ESA)	No

***Notes*:**

[1] 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*.

[2] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.

In Table 23, please note that cusk, a 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, cusk will not be discussed further in this section. However, additional information on cusk can be found at: https://www.fisheries.noaa.gov/endangered-species-conservation/candidate-species-under-endangered-species-act.

5.4.1 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 sea turtle 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 (https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; NMFS NEFSC FSB 2019). 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 (NMFS 2014; NMFS 2015a,b). 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).

5.4.2 Species Potentially Affected by the Alternatives Under Consideration

As noted in Table 23, 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.

5.4.2.1 Sea Turtles

5.4.2.1.1 Occurrence and Distribution

During the development of Framework 26 to the Scallop FMP, 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 (Conant *et al.* 2009; Hirth 1997; NMFS & USFWS 1995; 2007a; b; 2013; 2015; Seminoff *et al.* 2015; TEWG 1998; 2000; 2007; 2009), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS & USFWS 2008), leatherback sea turtle (NMFS & USFWS 1992; 1998b), Kemp's ridley sea turtle (NMFS & USFWS 2011), and green sea turtle (NMFS & USFWS 1991; 1998a).

- **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.* 1995a; Epperly *et al.* 1995b; 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.* 1995b; 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 off of, and 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.* 1995a; Epperly *et al.* 1995b; Epperly *et al.* 1995c; 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.* 1995b; 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 (i.e., Gulf of Maine) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006).

5.4.2.1.2 Gear Interactions

As in Section 5.4.2.1.1, 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 (Braun-McNeill & Epperly 2004; Braun-McNeill *et al.* 2008; Braun & Epperly 1996; Dodge *et al.* 2014; Epperly *et al.* 1995a; Epperly *et al.* 1995b; Griffin *et al.* 2013; James *et al.* 2005; James *et al.* 2006; Mitchell *et al.* 2003; Morreale & Standora 2005; NMFS & USFWS 1992; Shoop & Kenney 1992; TEWG 2009). 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 (Epperly *et al.* 2002; Haas *et al.* 2008; Henwood & Stuntz 1987; Lutcavage *et al.* 1997; Murray 2011; NMFS 2012; Sasso & Epperly 2006; Warden 2011a; b).

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 (FSB 2016; 2017; 2018; Murray 2015a) . 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 mat 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 are now required in waters west of 71°W from May 1 through November 30 each year (76 FR 22119, April 21, 2015). It should be noted, although the chain mat and TDD modifications are designed to reduce the serious injury and mortality to sea turtles interacting with dredge gear, it does not eliminate the take of sea turtles. NMFS continues to monitor the sea scallop fishery and its effects on sea turtles; however, to date, available data does indicate that since implementation of these regulations, sea turtle interactions with sea scallop dredge gear have decreased.

Using 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

[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.

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 24). 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 24)." 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 24 - 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

- **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[3] 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.[4] The 292 average annual observable loggerhead interactions equates to approximately 44 adult equivalent (Warden 2011a). Most recently, Murray (2015b) estimated that from 2009-2013, the total average annual

[2] Adult equivalence considers the reproductive value of the animal (Murray 2013; Warden 2011a), 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).

[3] Warden (2011a) defined the Mid-Atlantic as south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border.

[4] 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.

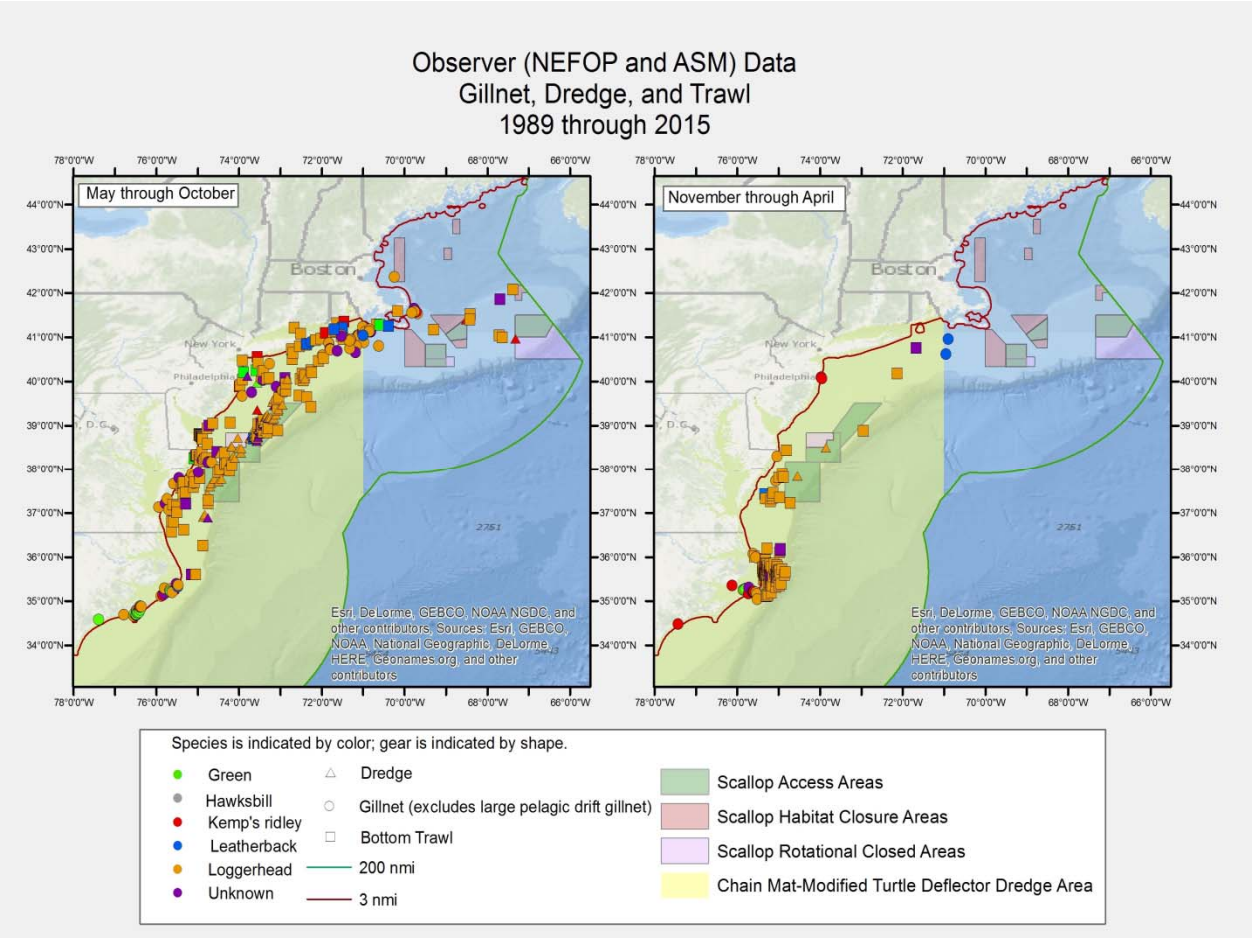
loggerhead interactions in bottom trawl gear in the Mid-Atlantic[5] was 231 (CV=0.13, 95% CI=182-298; this equates to approximately 33 adult equivalents (Murray 2015b). These latter estimates are a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (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 17 depicts 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.

[5] Murray (2015a) defined the Mid-Atlantic as the boundaries of the Mid-Atlantic Ecological Production; roughly waters west of 71°W to the North Carolina/South Carolina border)

Figure 17 – Observed location of turtle interactions in bottom tending gears in the Northeast Region (1989-2015).



5.4.2.2 Atlantic Sturgeon

5.4.2.2.1 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. Additional information on the biology, status, and range wide distribution of each distinct population segment of Atlantic sturgeon can be found in 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) and the Atlantic States Marine Fisheries Commission 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017).

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 (ASMFC 2017; ASSRT 2007; Dadswell 2006; Dadswell *et al.* 1984; Dovel & Berggren 1983; Dunton *et*

al. 2012; Dunton *et al.* 2015; Dunton *et al.* 2010; Erickson *et al.* 2011; Kynard *et al.* 2000; Laney *et al.* 2007; O'Leary *et al.* 2014; Stein *et al.* 2004b; Waldman *et al.* 2013; Wirgin *et al.* 2015a; Wirgin *et al.* 2015b; Wirgin *et al.* 2012). In fact, several genetic studies, have been conducted to address DPS distribution and composition in marine waters (Dunton *et al.* 2012; O'Leary *et al.* 2014; Waldman *et al.* 2013; Wirgin *et al.* 2015a; Wirgin *et al.* 2015b; Wirgin *et al.* 2012). These studies show that Atlantic sturgeon from multiple DPSs can be found at any single location along the Northwest Atlantic coast, with the Mid-Atlantic locations consistently comprised of all five DPSs (Damon-Randall *et al.* 2013; Dunton *et al.* 2012; O'Leary *et al.* 2014; Waldman *et al.* 2013; Wirgin *et al.* 2015a; Wirgin *et al.* 2015b; Wirgin *et al.* 2012). Although additional studies are needed to further clarify the DPS distribution and composition in non-natal estuaries and coastal locations, these studies provide some initial insight on DPS distribution and co-occurrence in particular areas along the U.S. eastern seaboard.

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 (Dunton *et al.* 2010; Erickson *et al.* 2011; Stein *et al.* 2004a; b); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Collins & Smith 1997; Dunton *et al.* 2010; Erickson *et al.* 2011; Stein *et al.* 2004a; b; Timoshkin 1968). 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.

5.4.2.2.2 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 1989-2018 confirms this determination. No Atlantic sturgeon have been reported as caught in scallop bottom trawl 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 2019).

5.5 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

5.5.1 Physical Environment

5.5.2 Essential Fish Habitat

5.6 HUMAN COMMUNITIES

5.6.1 Introduction

Amendment 21 evaluates the effect management alternatives may have on the economy, way of life, and traditions of human communities. These social and economic impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. While social and economic impacts could be solely experienced by individuals, it is more likely that impacts would be experienced across communities, gear types, and/or vessel size classes.

Summarized here are the fisheries and human communities most likely to be impacted by the Alternatives under Consideration. Social, economic and fishery information herein helps describe the response of the fishery to past management actions and predicting how the Amendment 21 alternatives may affect human communities. Also, this section establishes a descriptive baseline to compare predicted and actual changes resulting from management.

MSFCMA Section 402(b), 16 U.S.C. 1881a(b) states that no information gathered in compliance with the Act can be disclosed, unless aggregated to a level that obfuscates the identity of individual submitters. The fishery data in this amendment are thus aggregated to at least three reporting units, to preserve confidentiality. Additional standards are applied to reporting the fishing activity of specific states or fishing communities. To report landings activity to a specific geographic location, the landings have been attributed to at least three fishing permit numbers and the landings must be sold to three dealer numbers. However, the dealers do not necessarily have to be in the same specific geographic location.

5.6.2 Specifications and Total Landings

OFL and ABC have generally increased since 2011 (Table 25), in part, due to the exceptional year classes in 2012 and 2013. During FY 2011-2018, scallop landings ranged from 32M to 58M pounds. Although total landings exceeded annual projected landings in four years since FY 2011, the fishery has remained below the ABC and ACL.

Table 25. Scallop fishery OFL, ABC & ACL, APL and landings values (lbs).

FY	OFL (lbs)	ABC & ACL (lbs)	Annual Projected Landings (lbs)	Total Landings (lbs)	Landings/APL (%)
2011	71,401,113	60,117,854	52,300,000	58,461,465	112%
2012	75,799,335	63,848,076	57,200,000	57,098,684	100%
2013	69,566,867	46,305,894	38,216,741	39,807,589	104%
2014	67,062,415	45,816,467	38,463,656	32,020,980	83%
2015	83,910,142	55,891,593	47,400,000	36,974,195	78%
2016	150,835,870	83,449,375	46,932,006	42,423,177	90%
2017	166,415,938	103,037,447	45,230,038	51,325,269	113%
2018	158,854,083	101,302,409	57,748,612*	58,100,342	101%
2019	161,865,597	125,670,103	59,985,576		

Source: year-end catch reports, updated July 2019.
**includes APL after set-asides are removed, plus CAI carryover.*

5.6.3 Scallop Permits and Vessels

Scallop FMP was established in 1982. In 1994 (Amendment 4), a limited access program was created. Limited access vessels were assigned different DAS limits according to which permit category they qualified for: full-time, part-time or occasional. Amendment 4 also created the general category scallop permit for vessels that did not qualify for a limited access permit. Although originally created for an incidental catch of scallops in other fisheries, and for small-scale directed fisheries, the general category fishery and fleet has evolved since its creation in 1994.

Also in 1994, the general category scallop fishery was established as an "open access" fishery, any vessel that wanted to apply for a permit could; there were no specific qualifications to receive a general category permit. The main control on mortality for this component of the scallop fishery was a daily possession limit. Amendment 11, implemented in 2008, transitioned the general category component from an open access fishery to limited access. Vessels with at least 1,000 lbs. of landings history during a qualifying year (2000 – 2004) were eligible for an IFQ permit and "contribution factor" (allocation), while general category vessels that did not qualify for an IFQ permit were eligible for a Northern Gulf of Maine (NGOM) scallop permit, or an incidental catch permit.

Since 2008, all federal scallop permits have been limited access. A vessel can hold LA permits only, LAGC permits only, or a combination of LA and LAGC permits. There are multiple permit categories within LA and LAGC (Table 26). For LAGC, there are three types: LAGC Category A permits which are IFQ permits; LAGC Category B permits which are restricted to fishing in the NGOM; and LAGC Category C permits which are incidental catch permits restricted to 40 pounds of scallop catch. Within the LAGC Category A permits there are two types: vessels that can transfer and lease quota and those that cannot (i.e., Limited Access scallop vessels that also qualified for a LAGC IFQ permit). Limited access scallop vessels can also qualify for the two other general category permits (NGOM and incidental catch).

The scallop fishery is primarily full-time, with a small number of part-time (PT) permits. There are no occasional (OC) permits left in the fishery since 2009, as these were converted to part-time small dredge (PT-SMD). IFQ vessels are allocated 0.5% of the total projected annual scallop catch and each permit has an individual contribution factor.

Table 26. Scallop permit categories, qualifying criteria, harvest limits and allocation types.

Permit Type		Year Created	Action	Qualifying Criteria	Permit Category	Harvest Limits	Vessel level allocation?	Form of allocation
Limited Access[a]		1994	Amend. 4	One trip with over 400 pounds in either 1988 or 1989, extended for new vessels under construction	Based on number of days used in 1990, or average of 1985-1990 days	94.5% of APL, after set-asides and incidental catch removed	Yes	DAS and access area trips
LA General Category	**IFQ**	2008	Amend. 11	Possess Open Access GC permit	1,000 pounds landings in a year (FY2000-2004), individual allocation based on best year indexed by # of years active in the fishery	5.5% of APL, after set-asides and incidental catch removed		IFQ pounds; set # AA trips at fleet level
	NGOM				No landings history required	Up to TAC for management area, not linked to annual projected landings estimate	No	Harvest in area until LAGC fleet reaches TAC
	Incidental			Possess Open Access GC permit		Deducted from APL before allocating to LA and LAGC IFQ		Harvest allowed until limit is reached

Note: There are multiple categories of LA permits (full-time/part-time, dredge/trawl, small dredge).
Source: IFQ Review Tables 1 and 2.

5.6.3.1 Limited Access Permits and Vessels

Number of permits. There have been about 345 Limited Access vessels each year since 2009 (Table 25). Of these permits, most (~72%) are full-time vessels, with a small number of full-time small dredge (FT-SMD) and full-time trawl (FT-NET) permit holders. The number of LAGC permits held by LA vessels is in Table 28. The unique vessels with Right-ID Numbers are in Table 29 for 2008-2012. Only 347 out of 356 permits in 2008 belonged to unique vessels. Virtually all the LA vessels have been active since 2009 (Table 30).

Table 27. Number of LA vessels by permit category and gear, 2009-2018.

Permit Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Full-time	245	251	252	252	250	249	250	250	249	249
Full-time small dredge	53	52	52	51	52	53	51	51	51	54
Full-time trawl	11	11	11	11	11	12	11	11	11	10
Part-time	2	2	2	2	2	2	2	2	2	1
Part-time small dredge	30	32	32	31	30	32	31	32	31	31
Source: GARFO APSD data, accessed October 2019.										

Table 28. Number of LAGC permits held by LA vessels by permit category, 2009-2018

Calendar year	LA-LAGC combo vessels		
	LA & IFQ	LA & NGOM	LA & Incidental
2009	40	26	111
2010	40	27	113
2011	40	27	113
2012	41	27	111
2013	38	27	112
2014	40	27	113
2015	40	27	113
2016	40	27	113
2017	40	27	113
2018	39	27	113
Source: NEFSC permit data, accessed June 2019.			

Table 29. Number of LA and LAGC permits by unique right-id (MRIs) and category, 2009-2018.

Permit Category		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
LA	FT	118	119	119	118	119	118	118	119	118	119
	FT-SMD	31	31	31	30	30	31	31	31	30	32
	FT Trawl	5	5	5	5	5	5	5	5	5	5
	PT	2	2	2	2	2	2	2	2	2	1
	PT-SMD	21	23	23	23	21	22	23	23	23	23
LAGC	IFQ	199	161	141	122	119	124	122	134	129	127
	NGOM	21	23	23	23	21	22	23	23	23	23
Total MRIs		**383**	**350**	**328**	**312**	**318**	**327**	**328**	**346**	**340**	**346**
Source: GARFO APSD, accessed September 2019. *Notes:* LAGC incidental not included.											

Table 30. Active LA vessels by fishing year (vessels landing scallops).

FY	FT	FT SMD	FT-NET	PT	PT SMD
2009	245	53	11	2	32
2010	252	52	11	2	32
2011	251	52	11	2	32
2012	252	52	11	2	31
2013	250	52	11	2	31
2014	251	52	11	2	31
2015	249	52	11	2	32
2016	250	52	11	2	32
2017	252	52	11	2	31
2018	248	54	10	0	31

5.6.3.2 LAGC Permits and Vessels

The number of LAGC permits, including permits held by LA vessels, that declined considerably after 2007 as a result of the Amendment 11 provisions (Table 31).

Table 31. Number of LAGC permits including the LA vessels with LAGC permits.

Year	IFQ	NGOM	Incidental
2009	240	34	169
2010	198	36	167
2011	181	34	168
2012	164	39	177
2013	156	49	173
2014	166	52	168
2015	163	53	158
2016	172	60	165
2017	166	59	150

Table 32. Number of active vessels with LAGC permits including LA vessels with LAGC permits.

FY	IFQ	NGOM	INCI
2009	238	33	167
2010	198	36	167
2011	181	34	168
2012	164	39	177
2013	156	49	173
2014	166	52	168
2015	163	53	158
2016	172	60	165
2017	166	60	148
2018	166	68	149
Source: GARFO APSD data, accessed September 2019.			

Table 33. Number of LAGC permits excluding the LA vessels with LAGC permits, 2009-2018.

Year	IFQ	NGOM	INCI
2009	198	7	56
2010	158	9	54
2011	141	7	55
2012	123	12	66
2013	118	22	61
2014	126	25	55
2015	123	26	45
2016	133	33	52
2017	127	33	35
2018	127	41	36
Source: GARFO APSD data, accessed September 2019.			

Table 34. Number of active LAGC permits excluding the LA vessels with LAGC permits, 2009-2018.

Year	IFQ	NGOM	INCI
2009	202	8	59
2010	143	9	51
2011	139	8	55
2012	118	11	65
2013	115	24	58
2014	126	25	53
2015	122	24	44
2016	135	31	51
2017	129	35	35
2018	123	40	36
Source: GARFO APSD data, accessed September 2019.			

Sam Fleet Capacity index write-up

5.6.4 Scallop Fishery Effort

With the implementation of Amendment 10, the LA vessels were allocated DAS for open areas and area specific access area trips with no open area trade-offs. [6] The DAS averaged to about 25,000 during 2009-

[6] 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.

2012; it ranged from 16,000 to 19,000 during 2013-2015; and it increased substantially to around 23,400 during 2016-2017 fishing years.

Total DAS used by the LA vessels was higher in 2010 than 2009 despite lower number of access area trips (4 trips per vessel, Figure 18). Open area DAS allocations were slightly higher in 2010 (38 DAS versus 37 DAS in 2009) and vessels spent more time fishing in the access areas. Total DAS used declined since 2010 due to the decrease in open area DAS allocations. As a result of reduced access area trips to two trips per full-time vessel in 2014, the total DAS used reached its lowest level in that year with a total of 16,289 days.

LPUE for the full-time dredge (FT) vessels has been higher (almost 2,500 lb. in 2018) than the LPUE for full time small dredge (FT-STD) vessels (about 1,700 lb. in 2018, Figure 19). LPUE has increased substantially from their lows during 2014-2016. DAS for LAGC IFQ vessels declined substantially by about one third from its level at 7,507 in 2016 though LPUE has increased (Figure 20).

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

Year	Action	DAS	AA trips	CA1	CAII	NLS	VB	HC	ETA	DMV	Poss. Limit
2008	FW19	35	5	Closed	Closed	1 trip		Closed	4 trips	Closed	18,000
2009	FW19	42	5	Closed	1 trip	Closed		Closed	3 trips	1 trip	18,000
2010	FW21	38	4	Closed	Closed	1 trip		Closed	2 trips	1 trip	18,000
2011	FW22 and EA	32	4	1.5 trips	0.5 trips	Closed by emergenc y		1 trip	converted to open area	1 trip	18,000
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 converte	18,000
2013	FW24	33	2	118 trips***	182 trips	116 trips		210 trips	Closed	Closed	13,000
2014	FW25	31	2	Closed	197 trips	116 trips		Closed	Closed	313 trips****	1,2000
2015	FW26	30.86	3 *****	Closed	Closed	Closed		Merged into one Mid-Atlantic AA, but inshore part of ETA closed			17,000
2016	FW27	34.55	3	Closed	Closed	Closed ~		Merged into one Mid-Atlantic AA, but inshore part of ETA closed			17,000
2017	FW28	30	4	1	1			1, plus another trip to ETA rotational area			18,000
2018	FW29	21	6	1	Closed	3		1			18,000

** 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*

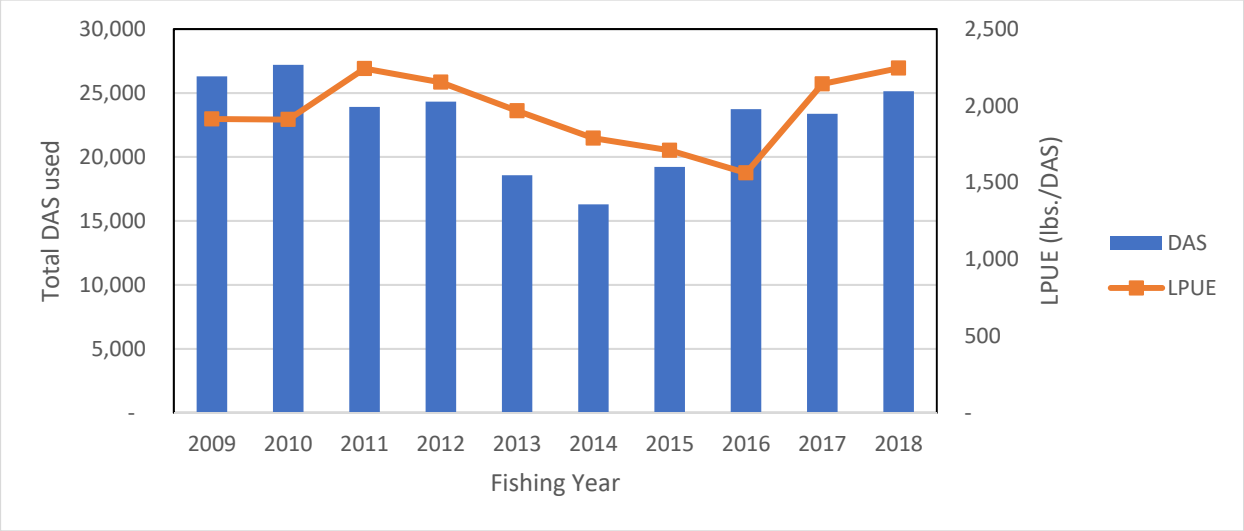
~ NL North open to LAGC only.

Table 36. Average gross tonnage, horsepower and length for active LA vessels.

FY	Active LA vessels			Active LAGC vessels		
	GRT	HP	Length (ft)	GRT	HP	Length (ft)
2010	155	808	83	64	435	58
2011	155	808	82	62	437	56
2012	155	812	82	59	445	55
2013	156	835	82	57	437	55
2014	156	853	82	57	441	54
2015	156	852	82	54	436	53

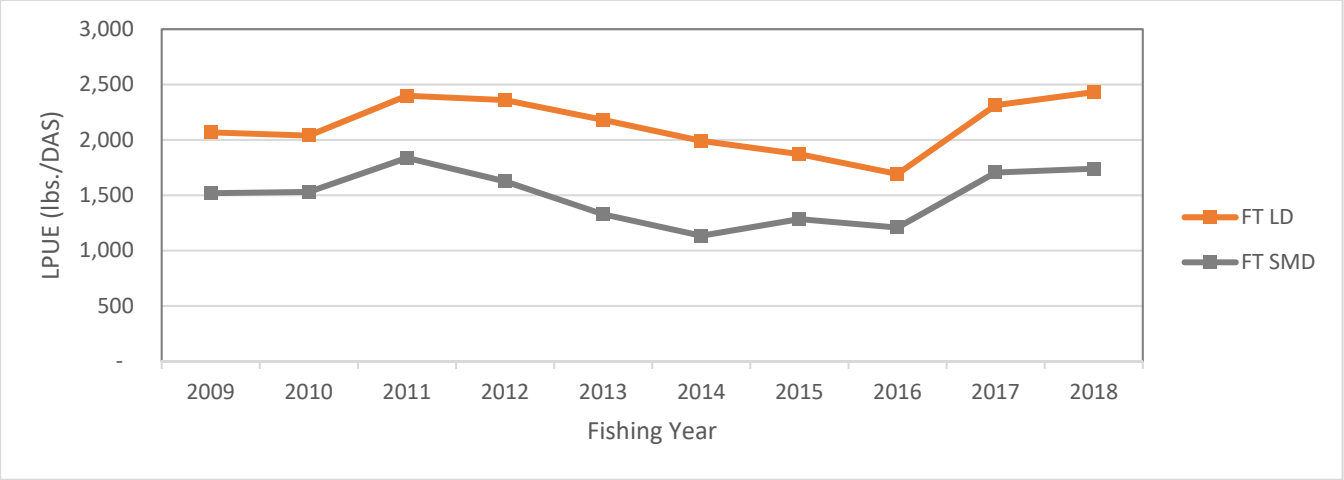
Source: NEFMC (2017, Section 4.2.4).

Figure 18. Total DAS used and LPUE by all LA vessels, FY2009-2018.



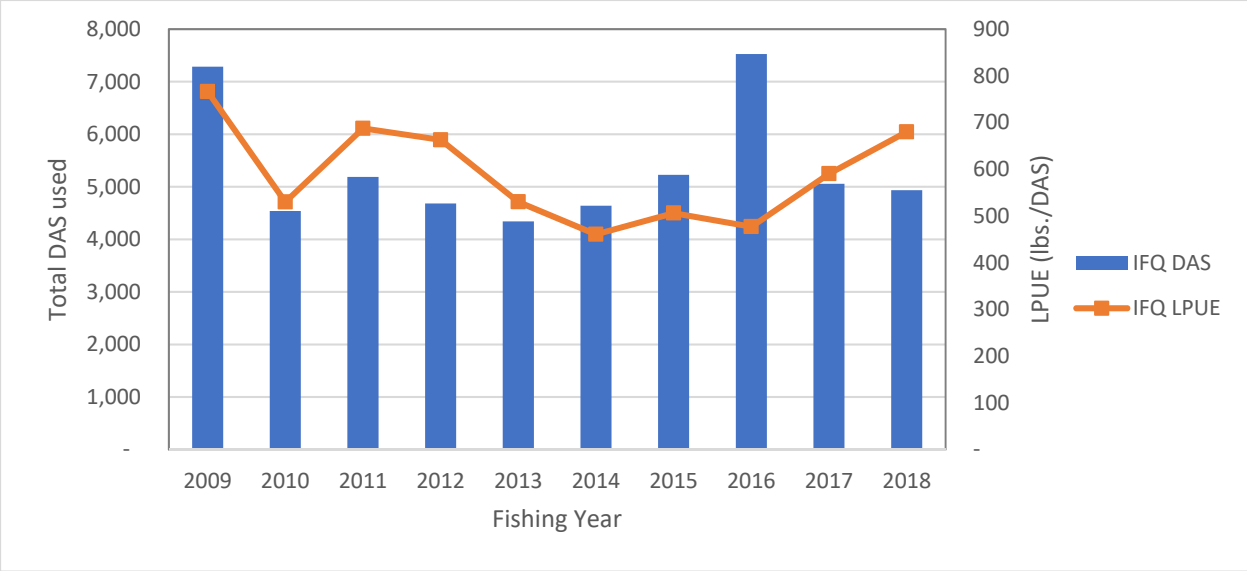
Source: VTR data, accessed October 2019.
Note: DAS used is date landed minus date sailed; LPUE is landings per DAS.

Figure 19. LPUE for full time and small dredge LA vessels, FY2009-2018.



Source: VTR data, accessed October 2019.
Note: DAS used is date landed minus date sailed; LPUE is landings per DAS.

Figure 20. LPUE and DAS used for LAGC IFQ only vessels, FY2009-2018.



Source: VTR data, accessed October 2019.
Note: DAS used is date landed minus date sailed; LPUE is landings per DAS.

5.6.5 Scallop Landings

Total scallop landings are described in Section 5.6.2.

5.6.5.1 Landings by Market Category

The share of larger scallops (U10) which was about 15% during 2009-2011 increased to about 20% in 2012-2013 and to 26% in 2014 (Table 38). It declined to about 17% in 2015 and has remained in the 11-19% range since. Similarly, the share of 11-20 count scallops declined from 77% in 2011 to 69% in FY 2018. On the other hand, the share of 21-30 scallop counts increased from 6% in 2012 to 35% in 2016, decreasing to 12% in 2018. Larger scallops generally fetch a higher price than the smaller scallops which attributed to an increase in overall average scallop prices from 2011-16 (Table 39).

Table 37. Scallop landings (lbs.) by market category, FY2009-2018.

FY	U10	U11 to 20	U21 to 30	U31+	Unknown	Total
2009	8,426,450	35,799,075	12,193,737	172,283	1,327,049	**57,918,594**
2010	8,770,955	36,052,201	10,831,759	63,244	939,048	**56,657,207**
2011	8,543,436	45,260,311	3,256,836	306,256	1,339,491	**58,706,330**
2012	10,485,521	41,587,639	3,486,843	63,484	1,234,715	**56,858,202**
2013	8,666,779	24,780,078	5,564,030	125,631	1,076,312	**40,212,830**
2014	8,046,766	19,084,369	4,079,070	286,378	873,788	**32,370,371**
2015	6,115,533	21,138,141	7,719,681	170,252	772,211	**35,915,818**
2016	4,720,193	18,774,077	14,691,792	2,202,112	1,141,890	**41,530,064**
2017	10,186,798	29,399,041	12,655,069	388,708	979,780	**53,609,396**
2018	10,857,391	41,363,933	6,929,958	65,768	875,675	**60,092,725**
Source: GARFO APSD, accessed September 2019.						

Table 38. Size composition of scallops, FY2009-2018.

FY	U10	U11 to 20	U21 to 30	U31+	Unknown
2009	15%	62%	21%	0.3%	2%
2010	15%	64%	19%	0.1%	2%
2011	15%	77%	6%	1%	2%
2012	18%	73%	6%	0.1%	2%
2013	22%	62%	14%	0.3%	3%
2014	25%	59%	13%	1%	3%
2015	17%	59%	21%	0.5%	2%
2016	11%	45%	35%	5%	3%
2017	19%	55%	24%	1%	2%
2018	18%	69%	12%	0.1%	1%
Source: GARFO APSD, accessed September 2019.					

Table 39. Average price per pound of scallops by market category (in 2017$), FY2009-2018.

FY	U10	U11 to 20	U21 to 30	U31+	UNK	All
2009	$9.37	$7.23	$7.18	$6.84	$7.17	**$7.53**
2010	$12.03	$8.47	$9.46	$9.75	$9.66	**$9.23**
2011	$11.29	$10.91	$11.59	$10.92	$10.69	**$11.00**
2012	$11.14	$10.54	$10.69	$10.68	$10.00	**$10.64**
2013	$13.26	$12.10	$12.35	$12.01	$10.38	**$12.34**
2014	$14.82	$12.66	$12.70	$11.43	$13.47	**$13.21**
2015	$15.96	$12.44	$11.99	$11.16	$11.65	**$12.92**
2016	$18.08	$12.50	$10.96	$9.67	$12.37	**$12.44**
2017	$13.16	$9.09	$9.20	$9.14	$11.26	**$9.93**
2018	$10.58	$8.73	$9.63	$8.93	$9.94	**$9.19**
Source: GARFO APSD, accessed September 2019.						

5.6.5.2 LA Vessel Landings

Scallops are primarily landed by Limited Access vessels, or 89-95% between 2011-2017 (Table 40). LA landings have been below the ACT since 2014. In 2017, LA vessel landings were 49M pounds, a 24% increase from 2016 (37M).

Table 40. Limited Access landings relative to ACT and fishery-wide landings, FY 2011-2017

FY	LA - only			Total Landings (lbs)	% Total Landings
	LA ACT (lbs)	LA Landings (lbs)	Landings/ACT (%)		
2011	47,247,267	53,929,369	114%	58,461,465	92%
2012	51,910,044	52,274,515	101%	57,098,684	92%
2013	33,783,637	35,743,247	106%	39,807,589	90%
2014	34,319,360	28,544,694	83%	32,020,980	89%
2015	42,617,560	32,818,998	77%	36,974,195	89%
2016	40,322,555	36,821,068	91%	42,423,177	87%
2017	85,149,139	48,879,324	57%	51,325,269	95%

Table 41 and Table 42 describe scallop landings by LA vessels by gear type and permit category. Most LA vessel effort is from vessels using scallop dredges, including small dredges. The number of full-time trawl permits (FT-NET) has decreased continuously and has been at 11 full-time trawl permitted vessels (Table 41).[7] Table 42 shows that the percentage of landings by FT trawl permits has remained around 3% of total limited access scallop landings in recent years.[8] About 79% of the scallop pounds were landed by vessels with full-time dredge (FT) permits and 14% landed by vessels with full-time small dredge (FT-STD) permits in 2017. Including the FT-NET vessels that use dredge gear, the percentage of scallop pounds landed by dredge gear amounted to over 99% of the total scallop landings during 2009-2017.

[7] Majority of these vessels (10 out of 11 in 2010) landed scallops using dredge even though they had a trawl permit.

[8] There were only 11 FT trawl permits in 2015. VTR data during 2009-2013 showed that over 90% of the scallop pounds by the FT trawl permitted vessels were landed using dredge gear (10 vessels) since these vessels can use dredge gear even though they have a trawl permit. All the part-time trawl and occasional trawl permits were converted to small dredge vessels.

Table 41. Scallop landings (lbs.) by Limited Access vessels by permit category, FY2009-2018.

FY	FT	FT SMD	FT-NET	PT	PT SMD	Total
2009	41,411,655	7,298,416	1,847,312	226,968	1,516,859	**52,301,210**
2010	42,779,955	6,792,986	1,788,545	238,648	1,902,279	**53,502,413**
2011	44,097,327	7,309,724	1,937,170	211,192	1,722,153	**55,277,566**
2012	42,749,294	7,063,239	1,756,899	210,977	1,442,388	**53,222,797**
2013	30,791,957	4,094,184	1,226,997	154,673	954,055	**37,221,866**
2014	24,836,675	3,179,401	880,098	107,759	709,398	**29,713,331**
2015	27,036,665	4,079,589	933,717	140,919	865,263	**33,056,153**
2016	29,781,474	4,821,326	1,279,350	199,145	1,276,757	**37,358,052**
2017	39,668,120	7,173,447	1,740,087	218,980	1,566,268	**50,366,902**
2018	45,463,989	7,861,387	1,619,563		1,820,059	**56,764,998**
Source: GARFO APSD data, accessed September 2019.						

Table 42. Percent of LA scallop landings (lb.) by permit category, FY 2009-2018

FY	FT	FT SMD	FT-NET	PT	PT SMD
2009	79%	14%	4%	0.4%	3%
2010	80%	13%	3%	0.5%	4%
2011	80%	13%	4%	0.4%	3%
2012	80%	13%	3%	0.4%	3%
2013	83%	11%	3%	0.4%	3%
2014	84%	11%	3%	0.4%	2%
2015	82%	12%	3%	0.4%	3%
2016	80%	13%	3%	0.5%	3%
2017	79%	14%	3%	0.4%	3%
2018	80%	14%	3%	0%	3%
Source: GARFO APSD data, accessed September 2019.					

5.6.5.3 LAGC Vessel Landings

LAGC IFQ. Since the LAGC IFQ allocation is 5.5% of the fishery wide APL, landings by LAGC IFQ vessels are small relative to the total fishery, 5-8% in FY 2011-2017 (Table 43). LAGC IFQ landings have been below the ACL since 2011. In 2017, LACG IFQ landings were 2.8M pounds, a 19% decrease from 2016 (3.5M lbs.).

Table 43. LAGC IFQ landings relative to IFQ ACL and fishery-wide landings, FY 2011-2017.

FY	IFQ ACL (lbs)	IFQ Landings (lbs)	Landings/ACL (%)	Total Landings (lbs)	% Total Landings
2011	3,201,880	3,046,245	95%	58,461,465	5%
2012	3,405,000	3,331,284	98%	57,098,684	6%
2013	2,449,856	2,414,256	99%	39,807,589	6%
2014	2,423,145	2,089,589	86%	32,020,980	7%
2015	2,971,831	2,353,787	79%	36,974,195	6%
2016	4,473,180	3,483,689	78%	42,423,177	8%
2017	5,538,012	2,821,411	51%	51,325,269	5%

Beginning FY 2010, LAGC-IFQ vessels were allocated 5% of the estimated scallop catch resulting a decline in landings by the general category vessels. The NEFMC IFQ program review report details the trends of the IFQ fishery during 2010-2015 (NEFMC 2017). Table 44 presents the number of IFQ only permits and their scallop landings during 2009-2017. Compared to 2016, the landings by IFQ vessels decreased in 2017 from about 3.5M pounds to 2.6M pounds.

Table 44. LAGC IFQ active vessels and landings (excluding LA vessels with IFQ permits), FY2009-2018.

Fish Year	Permit (IFQ only)	Landings lbs.
2009	202	3,758,125
2010	143	2,170,666
2011	139	2,870,826
2012	118	2,869,312
2013	115	2,302,402
2014	126	2,103,751
2015	122	2,413,760
2016	135	3,493,383
2017	129	2,584,087
2018	123	2,828,544
Source: GARFO APSD data, accessed September 2019.		

LAGC Incidental. Landings by the LAGC incidental vessels has been minor relative to the total fishery, 0.07-0.18% in FY 2011-2017 (Table 45). Incidental landings were above the landings target twice in FY 2011-2017. In 2017, LAGC incidental vessel landings were 18K pounds, a 76% decrease from 2016 (74K).

Table 45. LAGC Incidental Landings relative to target and fishery-wide landings, FY 2011-2017.

FY	Incidental Landings Target (lbs)	Actual Landings (lbs)	Landings/Target (%)	Total Landings (lbs)	% Total Landings
2011	50,000	38,700	77%	58,461,465	0.07%
2012	50,000	61,869	124%	57,098,684	0.11%
2013	50,000	47,337	95%	39,807,589	0.12%
2014	50,000	42,107	84%	32,020,980	0.13%
2015	50,000	29,395	59%	36,974,195	0.08%
2016	50,000	74,341	149%	42,423,177	0.18%
2017	50,000	18,383	37%	51,325,269	0.04%

5.6.6 Fishery Revenue

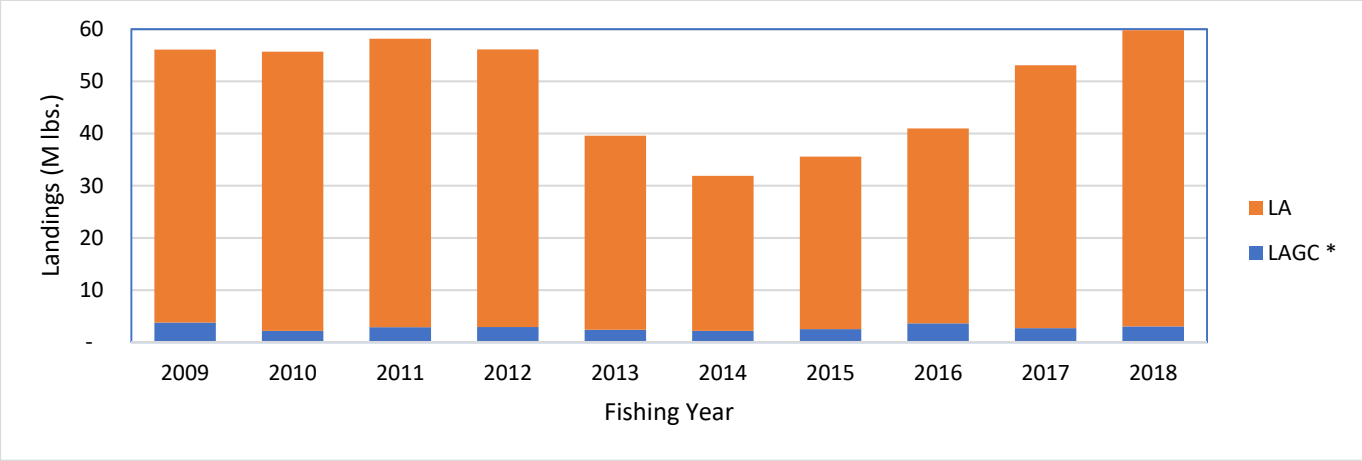
Since 2009, scallop revenue[9] peaked in FY 2011 at $646M. It declined during FY 2013-2015 but increased to $552M in FY 2018 (Figure 22). The ex-vessel prices of scallops increased significantly in FY 2011 from FY 2009, to over $9/pound. The declines in the value of the dollar led to an increase in exports of large scallops to the European countries resulting in record revenues from scallops for the first time in scallop fishing industry history. Average scallop ex-vessel price peaked to about $12/pound in FY 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 landings from $533M in 2011 to $387M in 2014. Average scallop price remained around $12/pound during 2014-2016, but it fell slightly below $10/pound in 2017. However, scallop revenue increased to about $520M in 2017 compared to $484M in 2016 despite a scallop price fall (Figure 22).

The average annual scallop revenue per vessel for both full-time dredge (FT) and full-time small dredge (FT-SMD) fluctuated with the annual landings during 2009-2017. The average scallop revenue per FT vessel reached $1.6M in 2011 as a result of higher landings combined with an increase in ex-vessel prices, but it declined to $1.2M in 2014. For FT-SMD vessels, average revenue per vessel increased to over $1.28M in 2011, but it declined to $0.7M in 2014 due to the decline in landings for the fishing year (Figure 23, Figure 24). In 2017, average revenue per vessel for FT and FT-SMD vessels increased to $1.5M and $1.3M, respectively, due to an increase in landings for both permit categories (Figure 24).

Although LAGC IFQ landings declined after 2009, as the overall TAC for this fishery declined from 10% in 2009 to 9% in 2010, scallop landings per active LAGC vessel exceeded the levels in 2009 after 2010 as the quota was consolidated. The revenue by IFQs vessel has increased over time during 2009-2017. The revenue peaked to about $308,000 in 2016 but declined to around $226,000 in 2017 (Figure 25).

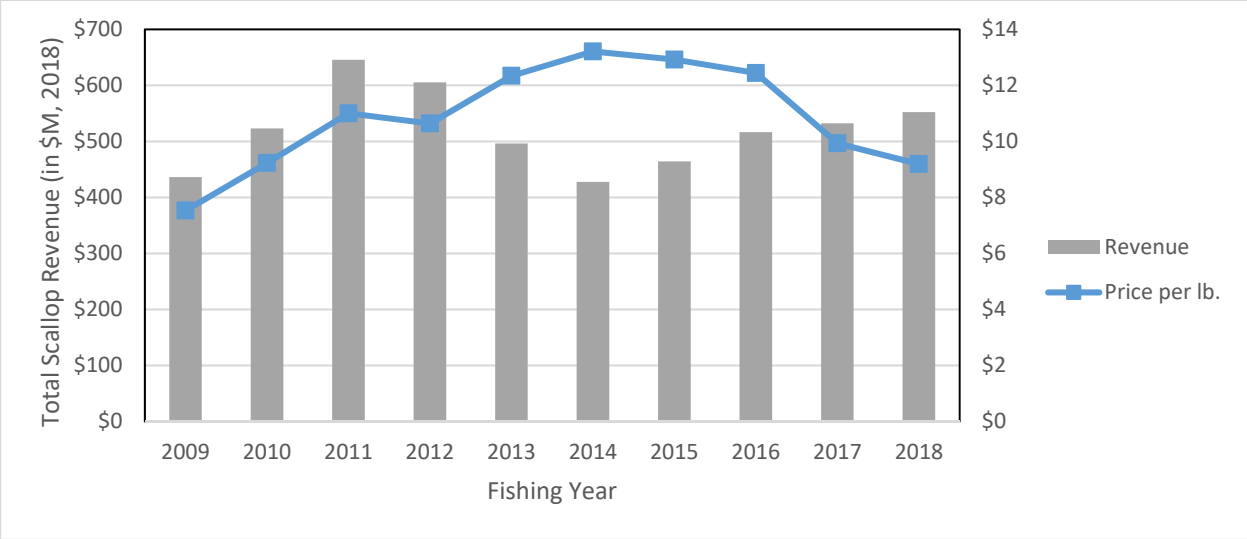
[9] All revenue data in this document is in terms of 2017 dollars.

Figure 21. Scallop landings (excluding incidental) by fishery component (LAGC and LA), FY2009–2018.



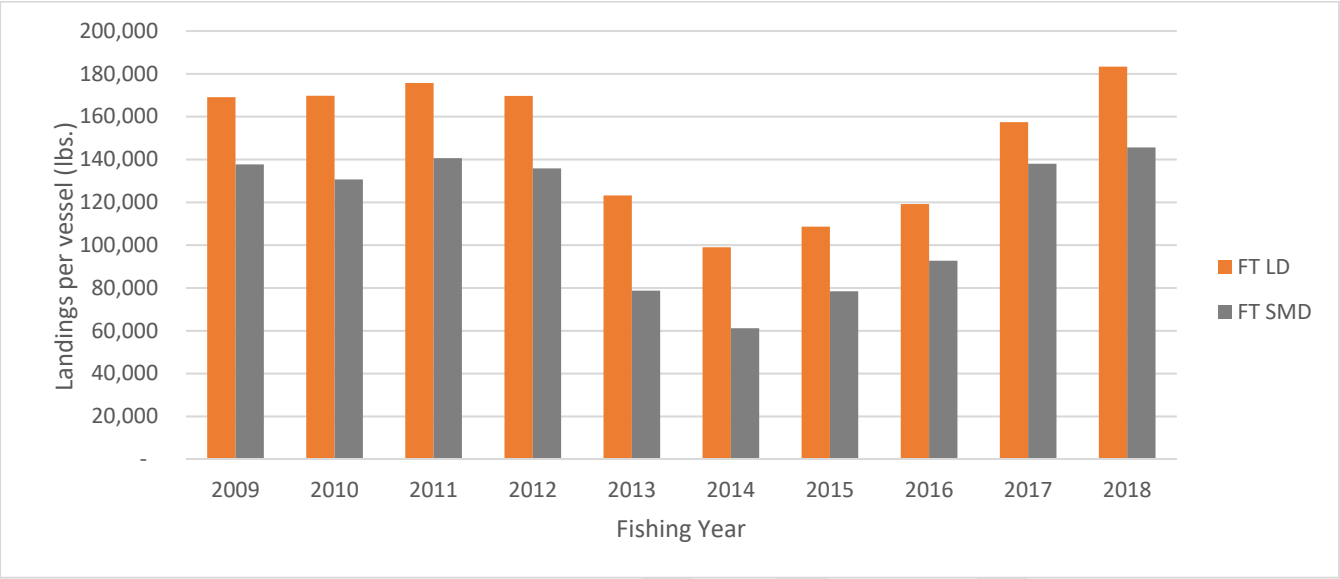
Source: GARFO APSD data, accessed September 2019.
* Excludes landings by incidental permits.

Figure 22. Total scallop revenue (all vessels) and ex-vessel price (in 2018 $), FY2009-2018.



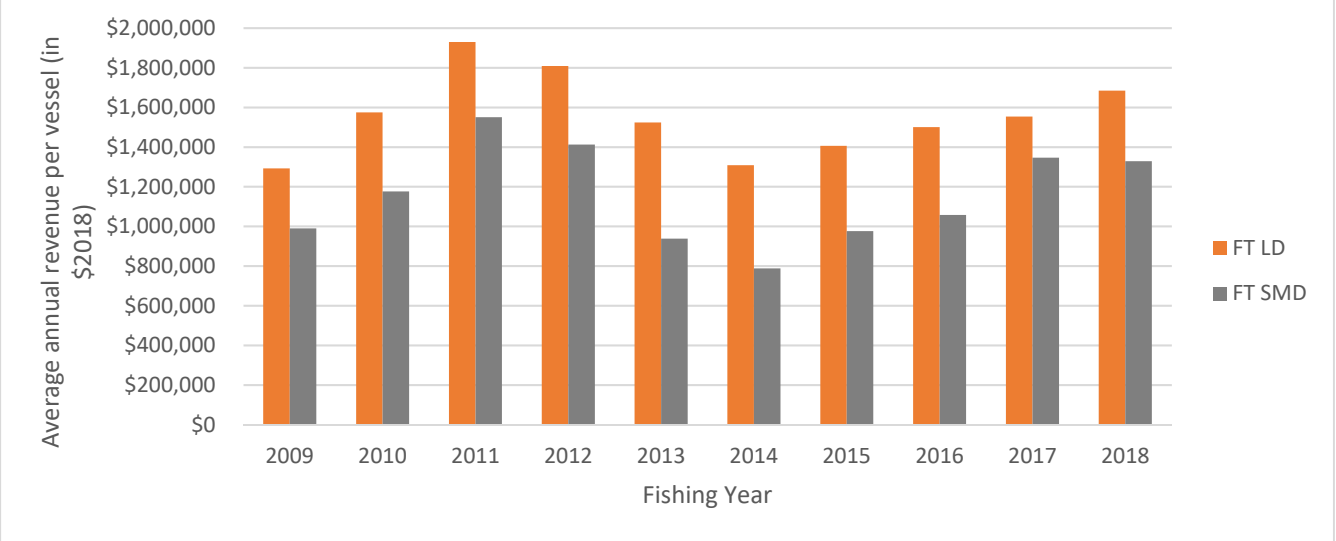
Source: GARFO APSD data, accessed September 2019.

Figure 23. Average annual scallop landings for full time and full time small dredge LA vessels, FY2009-2018.



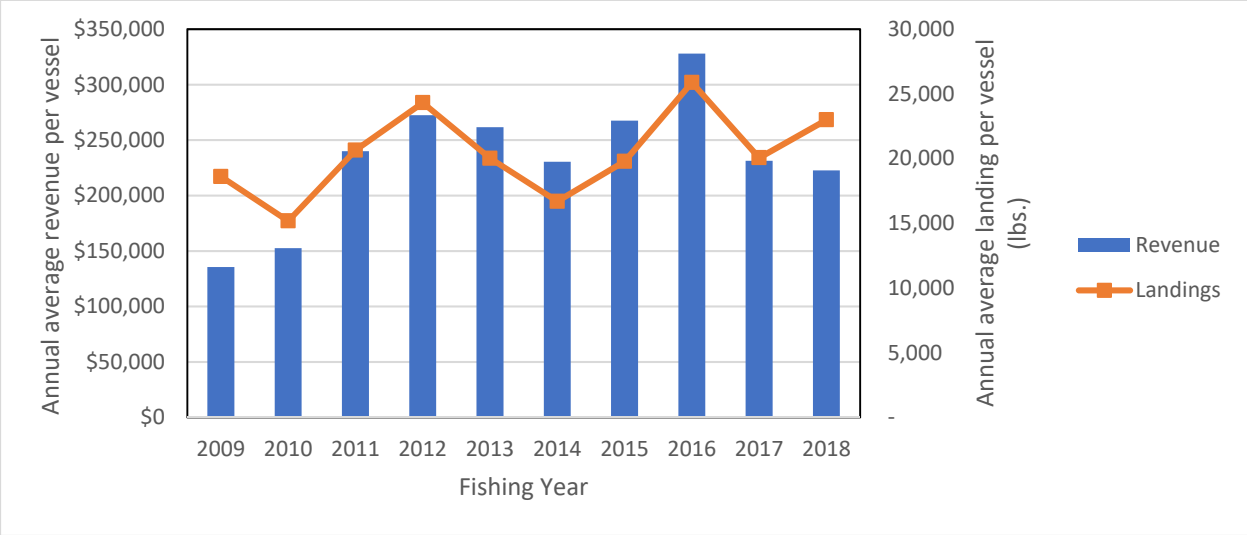
Source: GARFO APSD data, accessed September 2019.

Figure 24. Average annual scallop revenue for full time and full time small dredge LA vessels, FY2009-2018.



Source: GARFO APSD data, accessed September 2019.

Figure 25. Average annual scallop landings and revenue for LAGC IFQ only vessels, FY2009-2018.



Source: GARFO APSD data, accessed September 2019.

5.6.7 Fishing Communities

5.6.7.1 Introduction

There are over 200 communities that have been a homeport or landing port to one or more active sea scallop vessels since 2010. These ports occur throughout the coastal northeast and Mid-Atlantic, primarily from Massachusetts to Virginia. The level of activity in the sea scallop fishery has varied across time. This section identifies the communities for which sea scallops are particularly important. While the involvement of communities in the sea scallop fishery is described, individual vessel participation may vary.

Consideration of the socioeconomic impacts on these communities from proposed fishery regulations is required under NEPA and the MSFCMA. In particular, National Standard 8 of the MSFCMA stipulates that "conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851(a)(8)). A "fishing community" is defined in the MSFCMA, as "substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. § 1802(17)). Determining which fishing communities are "substantially" dependent on or engaged in a fishery can be difficult.

Although it is useful to narrow the focus to individual communities in the analysis of fishing dependence, there are several potential issues with data confidentiality. There are privacy concerns with presenting the data in such a way that proprietary information (landings, revenue, etc.) can be attributed to an individual vessel or a small group of vessels. This is particularly difficult when presenting information on small ports and communities that may only have a small number of vessels and data can easily be attributed to a vessel, dealer, or individual. The fishery data in this action are thus aggregated to at least three reporting units, to preserve confidentiality. To report landings activity to a specific geographic location (e.g., port,

state), the landings must be attributed to at least three fishing permit numbers and the landings must be sold to at least three dealer numbers. However, the dealers do not necessarily have to be in the same specific geographic location.

5.6.7.2 Communities Identified

Communities dependent on the sea scallop resource are categorized into primary and secondary port groups. Because geographical shifts in the distribution of sea scallop fishing activity have occurred, the characterization of some ports as "primary" or "secondary" may not reflect their historical participation in and dependence on the fishery.

Primary Port Criteria. The sea scallop fishery primary ports are those that are substantially dependent on or engaged in the fishery, and which are likely to be the most impacted by the alternatives under consideration. The primary ports meet at least one of the following criteria:

- At least $5M average annual revenue of sea scallops, 2010-2017 (Table 46);
- At least 50% of average annual fishing revenue was from sea scallops, 2010-2017 (with $500K as a minimum scallop revenue); or
- A top 10 port by percent of landings each year for either the limited access or the limited access general category scallop permit categories, fishing years 2013-2017.

Secondary Port Criteria. The sea scallop fishery secondary ports are those that may not be as engaged in or dependent on the fishery as the primary ports but are involved to a lesser extent. The secondary ports meet the following criterion:

- At least $500K average annual revenue of sea scallops during 2010-2017.

Atlantic Sea Scallop Primary Ports. Based on these criteria, there are 11 primary ports and 12 secondary ports in the sea scallop fishery (Table 47); confidential ports have been combined with adjacent non-confidential ports). The primary and secondary ports comprise about 92% and 4% of total fishery revenue, respectively, during 2010-2017. Most of the fishery revenue is from landings in New Bedford, and arguably New Bedford and Fairhaven, Massachusetts, could be considered one fishing community, separated only by the Acushnet River. As Hampton/Seaford and Newport News, Virginia are all located in the Hampton Roads metropolitan area, they could also be considered one fishing community. In both cases, the communities are distinguished because reporting their fishing activity is permissible within data confidentiality standards. Scallop fishing activity occurs along a spectrum across ports, rather than in the neat categories of "primary, secondary and other." For example, while Chatham, Massachusetts is considered secondary here, its contribution to the fishery closely matches Provincetown, its neighbor to the north and primary scallop port. While Gloucester is a secondary port, it is the main landing port for vessels with Northern Gulf of Maine permits, a focus of this action.

Because of the size and diversity of the sea scallop fishery, it is unpractical to examine each secondary port individually. However, they are listed here to provide a broader scope of potential communities impacted by scallop management measures. There are about 175 other ports that have had more minor participation (4%) in the fishery recently. Descriptions of the communities involved in the sea scallop fishery and all Northeast fishing communities are on the NEFSC website: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/. The Northeast Ocean Data Portal has interactive maps to help understand where dredge fisheries based in these ports have been active at sea over time: https://www.northeastoceandata.org/.

Table 46. Fishing revenue in primary and secondary sea scallop ports, calendar years 2010-2017.

Port	Average revenue, 2010-2017		
	All fisheries	Sea scallops only	% sea scallops
Primary Ports			
New Bedford, MA	$333.9M	$265.6M	80%
Cape May, NJ	$66.4M	$53.8M	81%
Hampton/Seaford, VA	$27.7M	$23.5M	85%
Newport News, VA	$26.2M	$23.3M	89%
Barnegat Light/Long Beach, NJ	$25.2M	$19.4M	77%
Fairhaven, MA	$17.3M	$12.5M	73%
Pt. Pleasant/Pt. Pleasant Beach, NJ	$25.4M	$11.6M	46%
Narragansett/Pt. Judith, RI	$42.1M	$7.2M	17%
Stonington, CT	$6.9M	$4.8M	69%
Provincetown, MA	$4.7M	$2.2M	47%
Wildwood, NJ	$4.6M	$4.4M	96%
Secondary Ports			
New London, CT	$4.9M	$2.2M	45%
Chatham, MA	$10.8M	$2.1M	19%
Atlantic City, NJ	$19.2M	$1.9M	10%
Gloucester, MA	$45.2M	$1.7M	4%
Harwichport/Barnstable, MA	$3.3M	$1.5M	45%
Montauk, NY	$16.4M	$1.3M	8%
Ocean City, MD	$5.9M	$0.9M	16%
Hampton Bays/Shinnecock, NY	$6.4M	$0.9M	14%
Sandwich, MA	$4.0M	$0.5M	14%
Total (n=approx. 200)	**$1,046.3M**	**$460.4M**	**44%**

Note: Inflation adjusted to 2017 dollars.
Source: NMFS dealer data, accessed October 2018.

Table 47. Primary and secondary ports in the sea scallop fishery.

State	Community	Average revenue, 2010-2017[a]			Top 10 landing port, 2013-2017[b]		Primary/ Secondary
		>$500K	>$5M	% scallops	LA	LAGC	
MA	Gloucester	√					Secondary
	Sandwich	√					Secondary
	Provincetown	√				√	Primary
	Chatham	√					Secondary
	Harwich/Harwichport/ Barnstable	√					Secondary
	Fairhaven	√	√	√			Primary
	New Bedford	√	√	√	√	√	Primary
RI	Narragansett/Pt. Judith	√	√		√		Primary
CT	Stonington	√	√	√	√		Primary
	New London	√					Secondary
NY	Montauk	√					Secondary
	Hampton Bays/Shinnecock	√					Secondary
NJ	Pt. Pleasant/pt. Pleasant Beach	√	√		√	√	Primary
	Barnegat Light/Long Beach	√	√	√	√	√	Primary
	Atlantic City	√					Secondary
	Wildwood	√	√	√			Primary
	Cape May	√	√	√	√	√	Primary
MD	Ocean City	√					Secondary
VA	Hampton/Seaford	√	√	√	√		Primary
	Newport News	√	√	√			Primary

Notes:
[a] Inflation adjusted to 2017 dollars.
[b] A top 10 port by percent of landings each year for either the LA or LAGC permits, 2013-2017.

5.6.7.3 States

Limited Access. The majority of the LA-only vessels have a home state and primary landing state of in MA followed by NJ, VA and NC (Table 48, Table 49). The distrubution of vessels in homeport state and port of landing have remained about same across the years and geographies during 2009-2018.[10]

Table 48. Number of limited access permits (LA only) by state of homeport, 2009-2018.

State	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ME	4	3	3	3	3	3	3	3	3	2
MA	145	147	148	149	149	150	145	145	145	147
RI	2	3	2	2	2	2	2	2	2	2
CT	10	10	10	10	9	9	9	10	10	9
NY	3	4	3	2	2	1	0	0	1	1
NJ	84	90	92	91	92	94	91	92	96	94
PA	5	5	4	3	3	3	3	3	3	3
VA	43	45	45	46	42	44	52	46	45	44
NC	41	40	39	38	40	39	41	41	38	38
FL	4	4	4	4	3	3	3	3	3	3
Total	**341**	**351**	**350**	**348**	**345**	**348**	**349**	**345**	**346**	**343**

Source: GARFO APSD data, accessed September 2019.

[10] The Scallop PDT generally describes changes in the scallop fishery at the community level based on both port of landing, and homeport state. A port of landing is the actual port where fish and shellfish have been landed. A homeport is the port identified by a vessel owner on a vessel permit application and is where supplies are purchased or crews are 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 gives an indication of the benefits received by vessel owners and crew from that port. However, during this analysis the PDT in the past have observed that many vessels declare a primary port for the year, and it may not always match up with the actual port that a vessel landed most scallop catches for the year. Therefore, these results should take that into consideration.

Table 49. Number of limited access permits (LA only) by state of primary landing port, 2009-2018.

State	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ME	4	3	3	3	3	3	3	3	3	2
MA	146	148	149	150	150	153	148	148	147	149
RI	2	3	2	2	2	2	2	2	2	2
CT	10	10	10	10	9	9	9	10	10	9
NY	2	3	3	2	2	1	0	0	1	1
NJ	88	93	94	94	94	95	93	95	100	98
PA	1	1	1	1	1	1	1	1	0	0
VA	62	64	64	63	59	60	64	58	56	56
NC	26	25	24	23	25	25	29	29	27	26
Total	**341**	**350**	**350**	**348**	**345**	**349**	**349**	**346**	**346**	**343**

Source: GARFO APSD data, accessed September 2019.

Limited Access General Category Although the majority of active LAGC IFQ vessels have had a homeport state MA or NJ since 2009 (Table 50), the percent of vessels homeported therein has increased, from 58% in 2009 to 68% in 2018. The percent of vessels based in NC has dropped from 15% to 8% over that time period. Primary landing port states have similar trends (Table 51).

Table 50. Number of active LAGC-IFQ permits by state of homeport (including LA vessels), 2009-2018.

State	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ME	9	6	3	4	3	3	5	3	6	9
NH	4	2	3	3	2	2	1	1	1	1
MA	64	48	47	41	40	45	45	48	49	52
RI	5	5	6	6	6	4	4	4	4	4
CT	4	3	2	3	4	5	4	4	4	4
NY	18	16	15	13	12	13	12	12	11	11
NJ	77	73	69	67	64	68	65	68	65	62
PA	3	3	3	3	3	3	2	2	2	2
DE	1	2	2	2	2	2	2	2	3	0
MD	8	5	4	3	2	2	2	4	3	3
VA	8	7	5	5	3	5	5	6	5	5
NC	36	28	22	14	15	14	15	17	13	13
GA	1	1	0	0	0	0	0	0	0	0
FL	1	1	0	0	0	0	0	0	0	0
TX	0	0	0	1	1	1	1	1	1	1
Total	**239**	**200**	**181**	**165**	**157**	**167**	**163**	**172**	**167**	**167**

Source: GARFO APSD data, accessed September 2019.
Note: Here LAGC IFQ = IFQ only + (LA+IFQ).

Table 51. Number of LAGC-IFQ permits (IFQ only) by state of primary landing port (excludes LA vessels), 2009-2018.

State	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ME	8	5	3	4	3	3	5	3	6	9
NH	4	1	2	2	1	1	0	0	0	0
MA	64	49	48	42	41	46	46	49	50	53
RI	6	6	6	6	6	4	4	4	4	4
CT	4	3	2	3	4	5	4	5	5	5
NY	17	15	15	13	12	13	12	11	10	10
NJ	82	76	73	71	68	72	68	71	68	63
PA	0	0	0	0	0	0	0	0	0	2
DE	0	0	0	0	0	0	0	1	1	0
MD	10	8	7	6	5	5	5	6	6	4
VA	8	7	5	5	3	5	5	6	5	6
NC	32	26	20	13	14	13	14	16	12	11
FL	2	2	0	0	0	0	0	0	0	0
GA	1	1	0	0	0	0	0	0	0	0
Total	**156**	**138**	**122**	**111**	**106**	**113**	**108**	**116**	**107**	**101**

Source: GARFO APSD data, accessed September 2019.
Note: Here LAGC IFQ = IFQ only + (LA+IFQ).

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The impacts of the alternatives under consideration are evaluated herein relative to the valued ecosystem components (VECs) described in the Affected Environment (Section 0) and to each other.

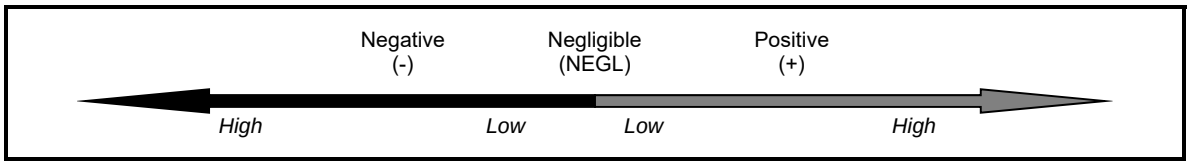
6.1 INTRODUCTION

6.1.1 Evaluation Criteria

This action evaluates the potential impacts using the criteria in Table 52.

Table 52. Terms used to summarize impacts on VECs

VEC	Direction		
	Positive (+)	**Negative (-)**	**Negligible/Neutral**
Allocated target species, other landed species, and protected species	Actions that increase stock/population size for stocks in rebuilding. For stocks that are rebuilt, actions that maintain stock population sizes at rebuilt levels. For protected species, actions that increase the population size, or decrease gear interactions.	Actions that decrease stock/population sizes for overfished stocks. Actions that would cause a rebuilt stock to become overfished. For protected species, actions that decrease the population size, or increase or maintain gear interactions.	Actions that have little or no positive or negative impacts to stocks or populations.
Physical Environment/ Habitat/EFH	Actions that improve the quality or reduce disturbance of habitat	Actions that degrade the quality or increase disturbance of habitat	Actions that have no positive or negative impact on habitat quality
Human Communities	Actions that increase revenue and social well-being of fishermen and/or associated businesses	Actions that decrease revenue and social well-being of fishermen and/or associated businesses	Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses
	Impact Qualifiers:		
	All VECs: Mixed	**both positive and negative**	
Low (L, as in low positive or low negative)	To a lesser degree		
High (H; as in high positive or high negative)	To a substantial degree (not significant)		
Likely	Some degree of uncertainty associated with the impact		



6.1.2 Approach to Impacts Analysis

6.2 Impacts on Atlantic Sea Scallops (Biological Impacts)

The Atlantic sea scallop resource is considered healthy; the stock is not overfished and overfishing was not occurring as of 2017. Additionally, after a period of very high fishing mortality during the mid-1980's and early-1990's, management measures curbed F and the stock responded positively. The overall impact of management on this resource has been positive from a biological perspective, with biomass increasing dramatically between 1994-2004, where it has remained fairly stable or increased. As noted in Table 53, the updated OFL for 2020 is nearly 24% greater than ABC/ACL for the fishery, while the actual allocations to fishery are around half of the total ABC (~100 million lb ABC vs. 50-60 million lb. APL). The impact analysis should be considered in the context of a successful management regime, and a large buffer between the OFL and allocations, with a low risk of exceeding the OFL.

6.2.1 Action 1 - Overfishing Limit and Acceptable Biological Catch

The Magnuson-Stevens Act requires that annual catch limits (ACLs) and accountability measures (AMs) be set in all fishery management plans to prevent overfishing. 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.

Table 53 - Comparison of the No Action OFL/ABC (default 2020 from FW30) and updated OFL and ABC estimates for 2020 and 2021 (Alternative 2).

	FY	OFL	ABC including discards	Discards	ABC with discards removed
Alt. 1 – No Action	2020	59,447	50,943	4,915	46,028
Alt. 2 – Updated OFL and ABC	2020	59,186	50,460	5,046	45,414
	2021	47,503	40,430	3,995	36,435

6.2.1.1 Alternative 1 – No Action for OFL and ABC

Under "No Action", the overall OFL and ABC would be set at the default values for FY 2020, which were adopted by the Council through FW30. The No Action ABC including discards is 50,943 mt or about 112 million pounds. The OFL and ABC values for No Action and Alternative 2 are very similar (~400 mt difference). The proposed ABC for FY2020 including discards is 50,460 mt or 111.2 million

pounds. This is a slight decrease (1 million pounds) from 2019 default measures. The growth of large year classes in the Nantucket Lightship area and the Mid-Atlantic Access Area, which have been tracked over several years, are beginning to level off and animals from these year classes have recruited into the fishery.

6.2.1.2 Alternative 2 – Updated OFL and ABC for FY 2020 and FY 2021 (Default)

The FY 2020 and FY 2021 OFL and ABC values that were approved by the SSC and recommended to the Council are summarized in Table 53. The updated ABC estimate including discards is 50,460 mt or 111.2 million pounds for FY2020. This is about 483 mt, or about 1 million pounds, lower than the No Action ABC (default). The current OFL and ABC values are driven by the growth of large year classes the Nantucket Lightship area and the Mid-Atlantic Access Area, which were considered exceptional when they were first observed.

While the FY 2020 OFL and ABC estimates are nearly the same as No Action, the 2020 default values decline, reflecting anticipated *F* and *M* in high density areas of the Nantucket Lightship South Deep and in the Mid-Atlantic Access Areas. After several years of below-average recruitment, the fishery is mining two exceptional year classes in the Mid-Atlantic and Nantucket Lightship regions. Some recruitment was detected on eastern Georges Bank in the 2019 surveys.

Overall, the values in Alternative 2 are based on the most updated survey information and model configurations; therefore, there should be positive impacts on the scallop resource from setting fishery limits with updated data for two years. Since fishing targets for the majority of the fishery are set lower than these limits, the plan reduces the risk of overfishing and optimizes overall yield from the fishery over the long term.

6.2.2 Action 2 – Northern Gulf of Maine Management Area

6.2.2.1 Partial Closure of Stellwagen Bank to Protect Small Scallops

6.2.2.1.1 Alternative 1 – No Action

Add text.

Relative to Alternative 2, No Action would be expected to have a low negative biological impact on scallops in the Northern Gulf of Maine management area.

6.2.2.1.2 Alternative 2 – Partial Closure of Stellwagen Bank to directed scallop fishing, within the Northern Gulf of Maine Management Area

Alternative 2 would close part of Stellwagen Bank north of 42°20'N to directed scallop fishing in the NGOM Management Area for two years to protect small scallops that were observed in 2019 dredge surveys of this area. The closure would cover roughly XXX square miles on Stellwagen Bank and would protect a substantial number of small scallops that have not recruited into the fishery. The closure area is shown in Map 2, and closure coordinates are provided in Table 6.

Stellwagen Bank has supported directed scallop fishing in the Northern Gulf of Maine Management Area for the last four fishing years (FY 2016 – FY 2019). While the 2019 surveys detected high densities of scallop small scallops, the survey also detected larger animals that were targeted by the fishery in 2019. The directed scallop fishing could be expected to north and west of the closure boundaries.

Relative to Alternative 1, a partial closure of Stellwagen Bank would be expected to have a low positive biological impact on scallops in the Northern Gulf of Maine management area.

6.2.2.2 Northern Gulf of Maine TAC Setting

Management: Both Alternative 1 and Alternative 2 would continue to implement measures developed through Framework 29 to fully account for removals from the NGOM management area by closing the NGOM management area to DAS fishing, and restricting harvest by LA vessels to NGOM RSA compensation awards. Both Alternative 1 and Alternative 2 could be expected to result in a complete accounting of removals from the NGOM management area.

Under both alternatives, separate NGOM TACs would be established for the LA and LAGC components, and the area would close to a component once its respective TAC was projected to be achieved. For example, if the LA TAC was attained but the LAGC TAC was not, LA vessels would no longer be allowed to fish in the NGOM, whereas the LAGC component would be allowed to continue fishing until the LAGC TAC was reached. To manage LA removals from the area, the LA share of the TAC would be awarded as NGOM RSA compensation fishing, and count as part of the 1.25 million lb scallop research set-aside (not in addition to). LA vessels would declare into the area and be limited to fishing within the area to harvest any NGOM RSA pounds they may be awarded. There would be no change in how LAGC vessels operate in the NGOM management area.

Assessment/TAC Setting: The NGOM is data-poor relative to the rest of the scallop resource (ex: no annual survey) and is not included within the CASA assessment model. There are no established biological reference points for this area. Areas of the NGOM from Machias/Seal Island to Stellwagen Bank were surveyed by UMaine/ME DMR in 2016. Additional survey work was completed in 2017 on Jeffreys Ledge and Stellwagen Bank using optical surveys (SMAST drop camera and CFF HabCam), after the area was closed to fishing. In 2018, the SMAST drop camera survey covered Stellwagen Bank, Jeffreys Ledge, Ipswich Bay, and Platts Bank. ME DMR and UMaine conducted a dredge survey of the NGOM ranging from Machias/Seal Island to Stellwagen Bank in 2019.

The 2020 and 2021 TACs considered in Alternative 2 (F=0.25, F=0.20, F=0.18) were developed using 2019 survey data and projecting exploitable biomass for the coming years on Jeffreys Ledge and in Ipswich Bay.

All NGOM TAC options under consideration could be considered conservative given the projections of biomass and exploitable biomass in the management area. Harvest associated these low fishing mortality rates could be expected to result in low positive to neutral impacts on the scallop resource in the management area.

6.2.2.2.1 Alternative 1 – No Action

TBC.

6.2.2.2.2 Alternative 2 - Set 2020 and 2021 NGOM TAC, with first 70,000 lbs to LAGC, then 50/50 split between LA and LAGC

Add text.

6.2.3 Summary of Relevant Biological Information

The following section describes the short-term (ST) and long-term (LT) impacts of fishery removals for each specification scenario. It should also be noted that the Council has been updating specifications on an annual basis with adjustments to the rotational management program and access areas. All estimates beyond FY 2020 are expected to be revisited again through a future action.

6.2.3.1 Overall Fishing Mortality

- All the alternatives under consideration have a total estimate of short term fishing mortality that is considerably lower than the limit used for setting fishery allocations for the fishery overall. The ACT, or annual catch target, includes an overall fishing mortality limit of 0.46 for the total fishery. The range of total fishing mortality under consideration is between 0.06 (Alternative 1 - No Action) and a high of 0.19 for options that would allocate 6 total access area trips and fish open areas at F=0.3 with the Closed Area II extension open.
- The total fishing mortality is constrained by the fishing target principle that does not enable average fishing mortality to increase above F_{MSY} in open areas (0.64). For the purposes of this analysis, average total fishing mortality over the long term was simulated at F=0.48. There are no Alternatives under consideration in Framework 32 that would set open area F at the upper bound of F=0.64. Alternatives in Section **Error! Reference source not found.** consider open area F rates under three separate open bottom configurations, and include DAS options of 20 DAS, 22 DAS, and 24 DAS. Setting open area F lower than the maximum target reduces overall fishing mortality.
- When compared to estimates of the overall F from the preferred alternatives in recent actions (FW25 – 30), the estimates of overall (total) F rates for all alternatives under consideration are similar (Table 54).
- The risk of overfishing is relatively low for all of the alternatives under consideration since the projected F rates are well below 0.64. However, the projection model tends to underestimate fishing mortality. In recent years when the projected F rate compared has been compared with the actual F rate the following year, total F has been underestimated by 20-30% in some years.

Figure 26 - Comparison of overall fishing mortality for each specification scenario.

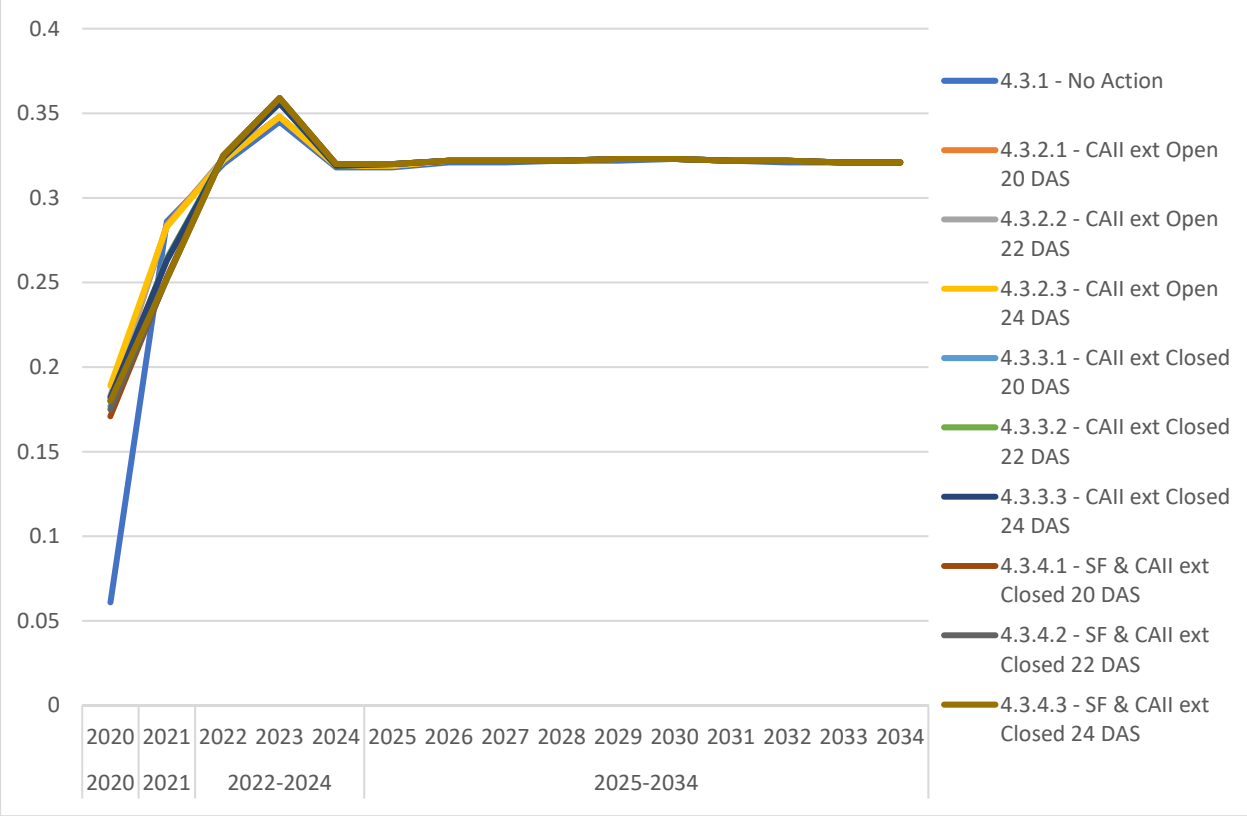
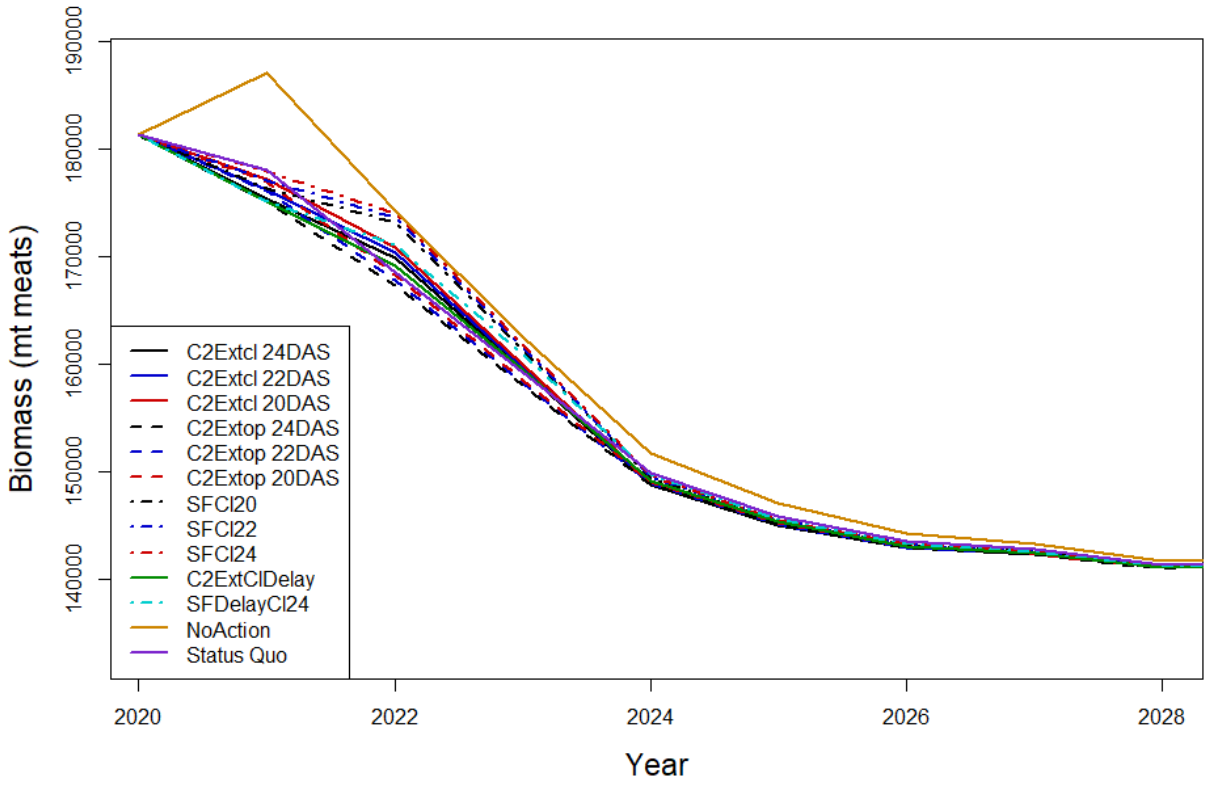
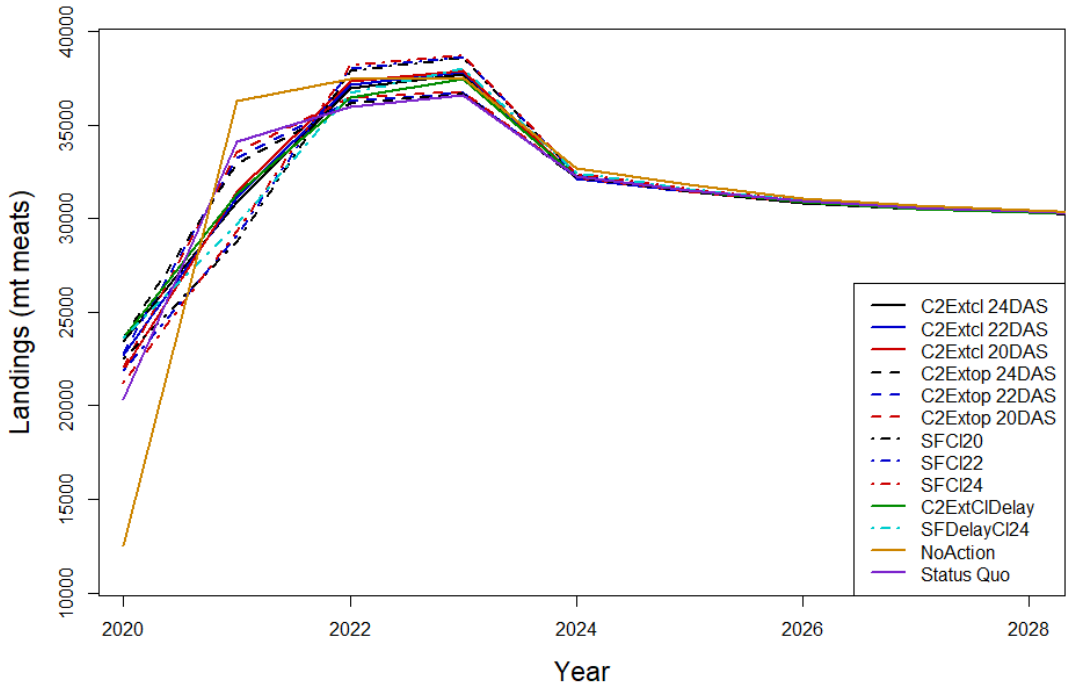


Table 54 - Comparison of estimates overall F and open area F between alternatives in FW32 and Council preferred alternatives form past actions.

Section	Description	Run	FW	FY Year	Overall F rate	Open Area F
	FW 25 Preferred	Pref	25	2014	0.21	0.52
	FW 26 Preferred	Pref	26	2015	0.224	0.48
	FW 27 Preferred	Pref	27	2016	0.1	0.48
	FW28 Preferred	Pref	28	2017	0.11	0.44
	FW 29 Preferred	Pref	29	2018	0.175	0.295
	FW 30 Preferred	Pref	30	2019	0.139	0.23
4.3.1	No Action	NA	32	2020	0.061	0.24
4.3.2.1	CAII ext Open 20 DAS	xop20	32	2020	0.18	0.24
4.3.2.2	CAII ext Open 22 DAS	xop22	32	2020	0.183	0.27
4.3.2.3	CAII ext Open 24 DAS	xop24	32	2020	0.189	0.3
4.3.3.1	CAII ext Closed 20 DAS	xc20	32	2020	0.177	0.27
4.3.3.2	CAII ext Closed 22 DAS	xc22	32	2020	0.18	0.3
4.3.3.3	CAII ext Closed 24 DAS	xc24	32	2020	0.182	0.33
4.3.4.1	SF & CAII ext Closed 20 DAS	sfc20	32	2020	0.171	0.3
4.3.4.2	SF & CAII ext Closed 22 DAS	sfc22	32	2020	0.175	0.34
4.3.4.3	SF & CAII ext Closed 24 DAS	sfc24	32	2020	0.18	0.38


Biomass (mt meats)
190000
180000
170000
160000
150000
140000
2020
2022
2024
2026
2028
Year
C2Extcl 24DAS
C2Extcl 22DAS
C2Extcl 20DAS
C2Extop 24DAS
C2Extop 22DAS
C2Extop 20DAS
SFCl20
SFCl22
SFCl24
C2ExtClDelay
SFDelayCl24
NoAction
Status Quo


Landings (mt meats)
40000
35000
30000
25000
20000
15000
10000
2020
2022
2024
2026
2028
Year
C2Extcl 24DAS
C2Extcl 22DAS
C2Extcl 20DAS
C2Extop 24DAS
C2Extop 22DAS
C2Extop 20DAS
SFCl20
SFCl22
SFCl24
C2ExtClDelay
SFDelayCl24
NoAction
Status Quo

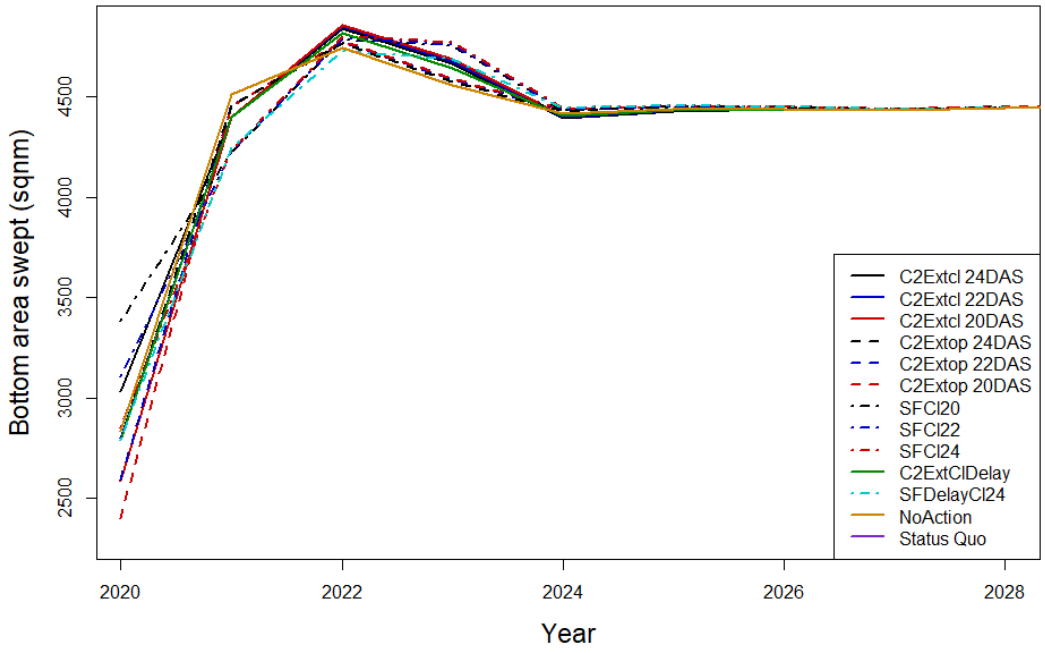


Figure 27 - HabCam tracks and scallop counts in the Nantucket Lightship region from 2018 surveys. No scallops between 35-75mm were detected in the NLS-Hatchet Area in the CFF survey.

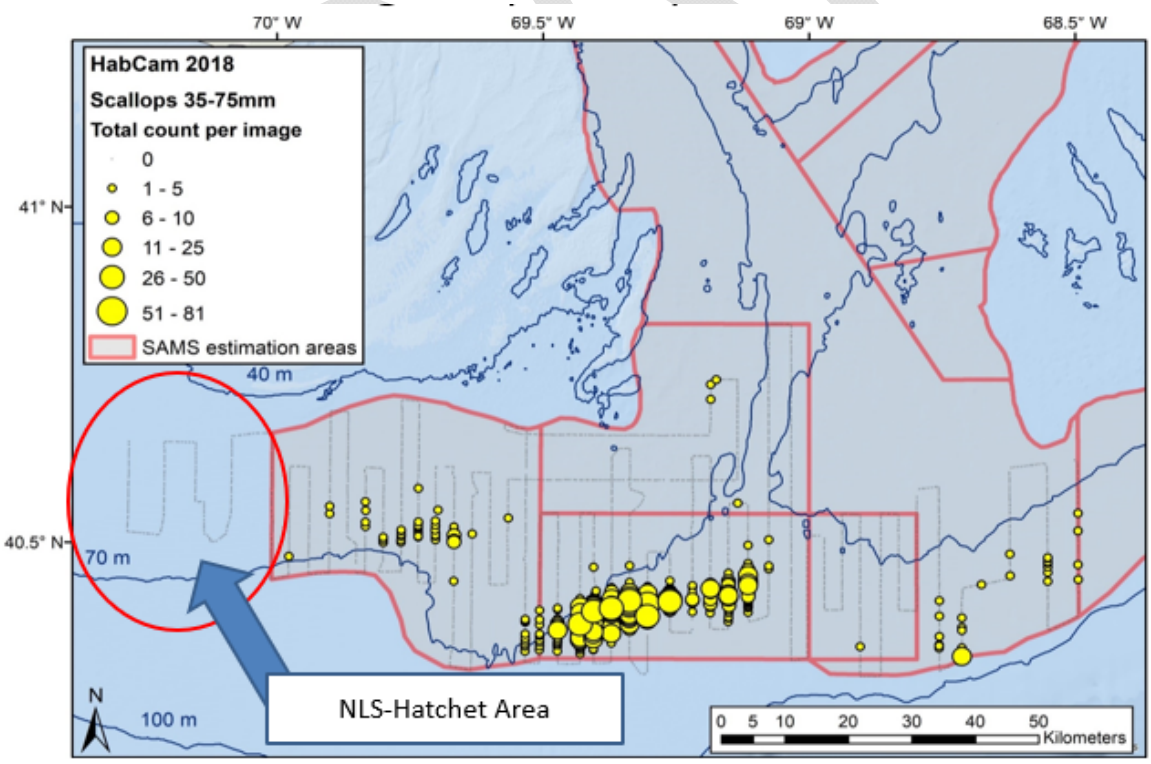
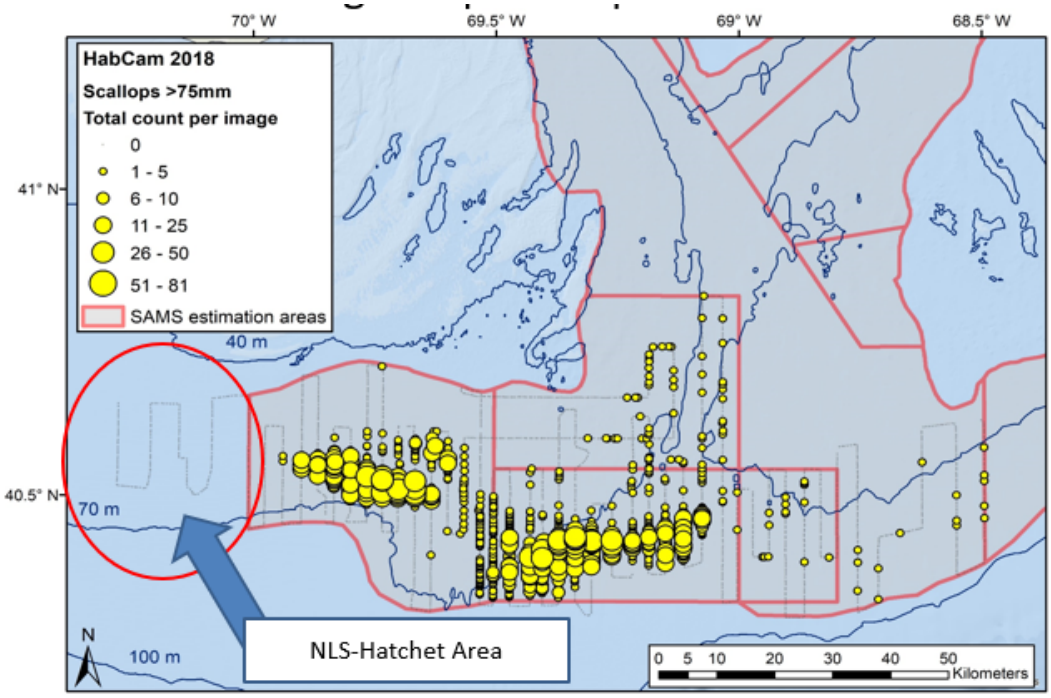


Figure 28 - HabCam tracks and scallop counts in the Nantucket Lightship region from 2018 surveys. No scallops with a SH > 75mm were detected in the NLS-Hatchet Area in the CFF survey.



6.3 Impacts on Physical Environment and Essential Fish Habitat

6.3.1 Action 1 – Overfishing Limit and Acceptable Biological Catch

Annual Biological Catch (ABC) and overfishing limits (OFL) are recommended by the Council's Scientific and Statistical Committee and approved by the Council. The growth of large year classes in the Nantucket Lightship area and the Mid-Atlantic Access Area, which have been tracked over several years, are beginning to level off and animals from these year classes have recruited into the fishery. Regardless of this influx of biomass to the fishery, the OFL, ABC, and ACL values set by the Council are often much higher than the projected landings by the fishery (in this action, both alternatives are nearly double). Therefore, realized impacts on EFH for this framework will largely reflect measures discussed in Section 6.3, and are only indirectly related to the ABC and OFL values.

The FY 2020 and FY 2021 OFL and ABC values that were approved by the SSC and recommended to the Council are summarized in Table 53. The updated ABC estimate including discards is 50,460 mt or 111.2 million pounds for FY2020. This is about 483 mt, or about 1 million pounds, lower than the No Action ABC (default). The current OFL and ABC values are driven by the growth of large year classes the Nantucket Lightship area and the Mid-Atlantic Access Area, which were considered exceptional when they were first observed.

6.3.1.1 Alternative 1 – No Action for OFL and ABC

The OFL and ABC values for No Action and Alternative 2 are very similar (~400 mt difference). Because the No Action ABC is nearly two times higher than the fishery allocations (annual projected landings), it is not anticipated to have a direct impact on EFH.

6.3.1.2 Alternative 2 – Updated OFL and ABC for FY 2020 and FY 2021 (Default)

The current OFL and ABC values are driven by the growth of large year classes the Nantucket Lightship area and the Mid-Atlantic Access Area, which were considered exceptional when they were first observed. Because the Alternative 2 ABC is nearly two times higher than the fishery allocations (annual projected landings), selecting this option is not anticipated to have a direct impact on EFH.

6.4 IMPACTS ON HUMAN COMMUNITIES

When examining potential economic and social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); dealers and processors; final users of scallops; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. While some management measures may have a short-term negative impact on some communities, this should be weighed against potential long-term benefits to all communities which can be derived from a sustainable scallop fishery. When regulations increase revenues (e.g., by increasing landings), the social and economic impacts become positive.

Economic impacts. In general, the economic effects of regulations can be categorized into regulations that change costs (including transactions costs such as search, information, bargaining, and enforcement costs) or revenues (by changing market prices or by changing the quantities supplied). These economic effects may be felt by the directly regulated entities and purchasers of scallops.

Social impacts. The social impact factors outlined below help describe the scallop fishery, its sociocultural and community context and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007) and other texts (e.g., Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms are limited. While this analysis does not quantify the impacts of the management alternatives relative to the social impact factors, qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts. The factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.

2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.

3. The effects of the proposed action on *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities.

4. The *Non-Economic Social Aspects* of the proposed action; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.

5. The *Historical Dependence on and Participation* in the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007).

General impacts of scallop fishery specifications on human communities

Reauthorization of the MSA requires the SSC to set an acceptable biological catch (ABC), or maximum catch level that can be removed from the resource taking into account all sources of biological uncertainty. The Council is prohibited from setting catch limits above that level. This requirement is expected to have long-term economic benefits on the fishery by helping to ensure that catch limits and fishing mortality targets are set at or below ABC. This should help prevent overfishing and optimize yield on a continuous basis. Increasing the scallop ABC (and associated catch limits, as contemplated in this action) would likely have positive short-term impacts on fishing communities. Likewise, lowering allowable harvests could result in short-term revenue reductions, which may, in turn, have negative impacts on employment and the size of the scallop fishery within fishing communities. Additionally, declines in fishing earnings may decrease job satisfaction among fishermen (e.g., Pollnac & Poggie 2008; Pollnac *et al.* 2015), which may reduce the well-being of fishermen, their families, and their communities (e.g., Pollnac *et al.* 2015; Smith & Clay 2010). In the long term, ensuring continued, sustainable harvest of the resource benefits all fisheries.

The specific communities that may be impacted by this action are identified in Section 5.6.7. This includes 11 primary ports (e.g., New Bedford, Cape May, Hampton/Seaford) and 12 secondary ports for the scallop fishery (Table 47). The communities more involved in the scallop fishery are likely to experience more direct impacts of this action, though indirect impacts may be experienced across all the key communities. As these specifications largely affect stock-wide harvest levels, impacts would likely occur across the communities that participate in the scallop fishery, proportional to their degree of participation.

6.4.1 Action 1 – Overfishing Limit and Acceptable Biological Catch

6.4.1.1 Alternative 1 – No Action for OFL and ABC

Under No Action, the ABC for FY 2020 (after discards are removed, 46,028 mt.) would remain unchanged from the default set through Framework 30 and be about 1% higher than the ABC under Alternative 2 (45,414 mt.). There would be no ABC set for FY2021.

The economic impacts of Alternative 1 are likely neutral to low negative. Since the ABC under No Action and Alternative 2 are very similar and are not expected to constrain the fishery, the impacts of the No Action ABC on economic benefits for FY2020 is likely to be neutral compared to Alternative 2. However, since Alternative 1 would not set a default OFL or ABC for FY 2021, the start of FY 2021 could be delayed (from April 1, 2021) if there is a delay in setting specifications next year. Therefore, the overall short-term impacts of Alternative 1 are likely to be negative compared to Alternative 2. In the long term, Alternative 1 is likely to have low negative stock benefits (Section 6.2.1.1). If this leads to more restrictive regulations, there may be negative long-term economic impacts.

The social impacts of No Action are expected to be neutral to low negative. In FY2020, a positive scenario for the fishery could continue. With no change in the FY 2020 ABC, there would be a degree of constancy and predictability for fishing industry operations and a steady supply to the market. The size of the fishery-related workforce would likely be unchanged, as would the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights). However,

fishermen could perceive the use of default specifications for sea scallops as a fishery management failure. The SSC determined (in October 2019) that the ABC should be lower to sustain the resource, so selecting No Action might cause distrust in management among the industry, and a feeling that managers are not making use of the best available science in a timely manner. This may lead to negative impacts on the attitudes of stakeholders towards management. The social impacts could be negative in the long term, because the default ABC for FY 2021 = 0 mt (i.e., there would be no fishery), unless the Council takes a future action to set the ABC that is implemented on-time.

6.4.1.2 Alternative 2 – Updated OFL and ABC for FY 2020 and FY 2021 (Default)

Alternative 2 would specify OFL and ABC for FY 2020 and FY 2021 and set default values for FY 2021 based onSSC recommendations (in October 2019, Table 53). The ABC (45,414 mt after discards are removed) for FY2020 would beabout 1% lower than the default ABC under No Action. The OFL and ABC values in recent years are driven by the growth of large year classes the Nantucket Lightship area and the Mid-Atlantic Access Area, which were considered exceptional when they were first observed.

The economic impacts of Alternative 2 are likely neutral to low positive. Since the ABC under No Action and Alternative 2 are very similar and are not expected to constrain the fishery, the impacts of the Alternative 2 ABC on economic benefits for FY2020 is likely to be neutral relative to No Action. Since Alternative 2 would set a default OFL or ABC for FY 2021, the start of FY2021 would not be delayed (from April 1, 2021) if there is a delay in setting specifications next year. Therefore, the overall short-term impacts of Alternative 2 are likely to be positive compared to No Action. In the long term, Alternative 2 is likely to have low positive stock benefits (Section 6.2.1.2) because the ABC values were determined based on recent surveys and best available science to prevent overfishing of the scallop resource. If this leads to less restrictive regulations, there may be positive long-term economic impacts.

The social impacts of Alternative 2 are expected to be neutral to low positive. In the short term, a positive scenario for the fishery could continue. There would likely be similar employment opportunities and the size of the fishery-related workforce could be maintained. The historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) could be sustained. Relative to Alternative 1, Alternative 2 provides essentially the same fishing opportunities for participants in the scallop fishery for FY 2020. Using the SSC recommendation would likely cause more trust in management among the industry relative to No Action, and a feeling that managers are making use of the best available science in a timely manner. This may lead to positive impacts on the attitudes of stakeholders towards management. The industry could realize the benefits of yield that is supported by the best available science. With a default ABC for 2021, there is more assurance under Alternative 2 that the fishery will continue, providing a degree of predictability for fishing industry operations into the future, leading to long-term positive social impacts.

6.4.2 Action 4 - Access Area Trip Allocations to the LAGC IFQ Component

6.4.2.1 Alternative 1 – No Action

Under No Action, LAGC IFQ vessels would be allocated 571 trips to the MAAA access area and 571 trips to the NLS-West access area starting on April 1. This is equivalent to default number of trips from FW30. Under No Action a small percentage of the LAGC IFQ catch could come from access areas, with the rest coming from open areas. However, the cost of fishing could be higher in the open areas compared to fishing in access areas which are expected to have a higher abundance of exploitable scallops. Usually

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

6.4.2.2 Alternative 2 - LAGC IFQ Access Area Trips

Update after Committee meeting.

6.4.3 Action 5 – Additional Measures to Reduce Fishery Impacts

6.4.3.1 RSA Compensation Fishing

6.4.3.1.1 Alternative 1 – No Action

Under Alternative 1 (No Action), 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. This alternative is expected to have negligible biological and economic impacts on the scallop fishery as a whole.

6.4.3.1.2 Alternative 2 – No Action

Under Alternative 2, RSA compensation fishing would be permitted only in the Mid-Atlantic Access Area, the NGOM Management Area, and in open areas. RSA compensation fishing would not be permitted in Closed Area I, Closed Area II, Nantucket Lightship-North, and Nantucket Lightship-South-deep. RSA compensation fishing would be permitted in the NGOM management area by vessels that are awarded NGOM RSA compensation pounds as described in Section 4.2.2, not to exceed the LA share of the NGOM TAC.

This provision will help accurately account for scallop removals in the NGOM by restricting RSA compensation fishing to vessels that receive a portion of the LA TAC, will facilitate access to high densities of scallops in available access areas, and reduce impacts on small scallops and overall mortality in Closed Area II. Therefore, this alternative could have low positive impacts on the scallop yield and negligible to low positive economic benefits over the long-term for the scallop fishery.

6.5 CUMULATIVE EFFECTS

6.5.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ; 40 CFR part 1508.7) and NOAA's policy and procedures for NEPA, found in NOAA Administrative Order 216-6A (Companion Manual, January 13, 2017). The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in this action together with past, present, and reasonably foreseeable future actions that affect the human environment. The predictions of potential synergistic effects from multiple actions, past, present and/or future are generally qualitative.