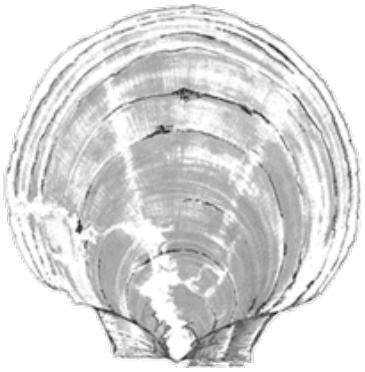
Scallop Fishery Management Plan

Framework Adjustment 34

Including an Environmental Assessment and

Regulatory Flexibility Analysis



DRAFT

December 6, 2021

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
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FRAMEWORK ADJUSTMENT 34 TO THE ATLANTIC SEA SCALLOP FISHERY MANAGEMENT PLAN

Proposed Action: Propose updated fishery specifications for FY 2022 and FY 2023 (default) with corresponding management measures, and manage removals from the NGOM management area.

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Abstract:

The New England Fishery Management Council, in consultation with NOAA's National Marine Fisheries Service, has prepared Framework Adjustment 34 to the Atlantic Sea Scallop Fishery Management Plan, which includes a final environmental assessment that presents the range of alternatives to achieve the goals and objectives of the action. The proposed action focuses on setting scallop fishery specifications for fishing years 2022 and 2023 (default). The document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives on both. It addresses the requirements of the National Environmental Policy Act, the Magnuson Stevens Fishery Conservation and Management Act, the Regulatory Flexibility Act, and other applicable laws.

1.0 EXECUTIVE SUMMARY

Framework 34 (FW34) is intended to set specifications and to adjust management measures for the Atlantic Sea Scallop fishery to achieve the objectives of the fishery management plan (FMP). This action is needed to prevent overfishing and improve yield-per-recruit from the fishery, and to manage total removals from the Northern Gulf of Maine management area. The Council considered a range of alternatives to address the purpose and need of this action.

In Action 1, Overfishing Limit and Acceptable Biological Catch, the Council selected Alternative 2, update the overfishing limit (OFL) and acceptable biological catch (ABC) for FY 2022 and FY 2023 (default) as *preferred*. The ABC value with discards removed for FY2022 is set at 25,724 mt, which is lower compared to the FY2021 value of 30,517 mt.

the Council implemented changes to Northern Gulf of Maine (NGOM) management adopted through Amendment 21 in Action 2.

For Action 3, the Council developed a range of fishery specifications for FY 2022 and default measures for FY 2023 for both limited access and limited access general category vessels.

This action also includes default measures for FY 2023. These default measures were developed to be in place only until a subsequent action implements updated allocations for FY 2023. Default measures for full-time limited access vessels set DAS at 75% of the DAS allocation for 2022.

Action 4 designates the number of LAGC IFQ access area trips that may be taken in open rotational access areas.

In Action 5, the Council considered to sets of measures to reduce fishery impacts, specifically, where RSA compensation fishing may occur.

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2.4 ACRONYMS

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
AIM	An Index Method of Analysis
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ANPR	Advanced Notice of Proposed Rulemaking
AP	Advisory Panel
APA	Administrative Procedures Act

APL	Annual Projected Landings
ASMFC	Atlantic States Marine Fisheries Commission
B_{MSY}	Biomass that would allow for catches equal to Maximum Sustainable Yield when fished at the overfishing threshold (FMSY)
BiOp, BO	Biological Opinion, a result of a review of potential effects of a fishery on Protected Resource species
CAI	Closed Area I
CAII	Closed Area II
CEQ	Council on Environmental Quality
CPUE	Catch per unit of effort
d/K	Discard to kept catch ratio
DAM	Dynamic Area Management
DAS	Day(s)-at-sea
DFO	Department of Fisheries and Oceans (Canada)
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DPWG	Data Poor Working Group
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
F	Fishing mortality rate
FEIS	Final Environmental Impact Statement
FMP	Fishery management plan
FW	Framework
FY	Fishing year
GARFO	Greater Atlantic Regional Fisheries Office
GARM	Groundfish Assessment Review Meeting
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
GRT	Gross registered tons/tonnage
HAPC	Habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
IFM	Industry-funded monitoring
IFQ	Individual fishing quota
INCI	Incidental permit
ITQ	Individual transferable quota
IVR	Interactive voice response reporting system
IWC	International Whaling Commission
LA	Limited access
LAGC	Limited access general category
LOA	Letter of authorization
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act

MPA	Marine protected area
MRI	Moratorium Right Identifier
MRIP	Marine Recreational Information Program
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NEAMAP	Northeast Area Monitoring and Assessment Program
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NGOM	Northern Gulf of Maine
NLS-N	Nantucket Lightship North
NLS-S-deep	Nantucket Lightship South Deep
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OBDBS	Observer database system
OLE	Office for Law Enforcement (NMFS)
OY	Optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SAP	Special Access Program
SARC	Stock Assessment Review Committee
SAS	Stock Assessment Subcommittee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SIA	Social Impact Assessment
SNE	Southern New England
SNE/MA	Southern New England-Mid-Atlantic
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
TAL	Total allowable landings
TED	Turtle excluder device
TEWG	Technical Expert Working Group
TMS	Ten minute square
TRAC	Transboundary Resources Assessment Committee
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	Vessel monitoring system
VEC	Valued ecosystem component
VPA	Virtual population analysis
VTR	Vessel trip report
WGOM	Western Gulf of Maine
YPR	Yield per recruit

3.0 BACKGROUND AND PURPOSE

This EA is being prepared using the 2020 CEQ NEPA Regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020, and reviews begun after this date are required to apply the 2020 regulations unless there is a clear and fundamental conflict with an applicable statute. 85 Fed. Reg. at 43372-73 (§§ 1506.13, 1507.3(a)). This EA began on June 22, 2021 and accordingly proceeds under the 2020 regulations.

3.1 BACKGROUND

This framework adjustment to the Scallop Fishery Management Plan (FMP) sets fishery specifications for fishing year (FY) 2022 and default measures for FY 2023.
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 recommended by the SSC and approved by the Council;
- 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 TAL and NGOM Set-Aside;
- 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, such as measures to mitigate impacts on Georges Bank yellowtail flounder and Northern windowpane flounder.

3.2 PURPOSE AND NEED

The purpose and need for Framework 34 are described in Table 1.

Table 1. Purpose and need for Framework 34.

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 2022 fishing year including adjustments to the Closed Area II seasonal closure, as well as default measures for FY2023 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 in the Northern Gulf of Maine management area based on exploitable biomass.	To manage total removals from the Northern Gulf of Maine management area.

3.3 SUMMARY OF ANNUAL CATCH LIMITS

These specifications include 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 assessments 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).

Overfishing Limit. The OFL is specified as the level of catch 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. The 2020 stock assessment (NEFSC 2020) set the OFL where F = 0.61. 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).

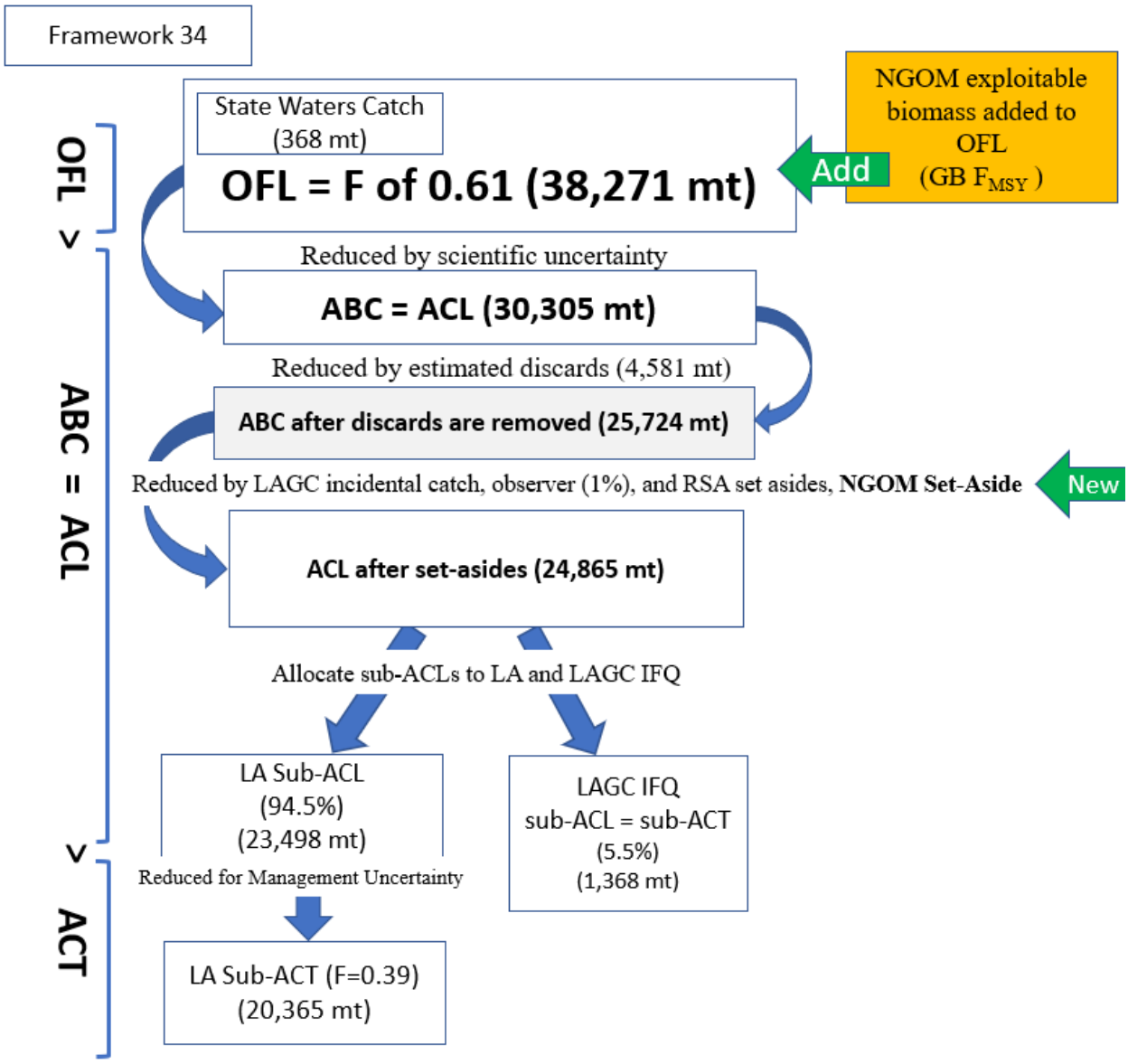
Annual Catch Limit. The ACL is equal to the ABC in the Scallop FMP. The 2020 management track assessment determined that the F associated with the ABC/ACL is F=0.45. As specified in Amendment 21, exploitable biomass from the Northern Gulf of Maine contributes to the overall OFL and ABC. Observer and research set-asides are removed from the ABC (1 percent of the ABC/ACL and 1.275 mil lb. (578 mt), respectively). The NGOM Set-Aside, which is available for directed LAGC fishing, is also removed before calculating the legal limits for LA and LAGC IFQ. The remaining available landings (allocation) 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.

Annual Catch Targets. For each sub-ACL there is an ACT to account for management uncertainty. For the LA fleet, the ACT has an associated 75% probability that the ACT will not exceed the ABC/ACL. The F associated with the LA ACT is F = 0.39. The major sources of management uncertainty in the LA fishery are carryover provisions including the 10 DAS carryover provision and allowing vessels to fish unused access area allocation from the previous fishing year within the first 60 days of the year. For the LAGC fleet, the ACT is equal to the LAGC fleet's sub-ACL, since this component is managed entirely by quotas 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.

Annual Projected Landings. The annual projected landings (APL) were developed using a forward projection model (SAMS) of the scallop resource. The APL combines projected landings of exploitable scallops from open area DAS when fishing at an F determined by the Council and expected landings from

access areas. The APL is allocated between the Limited Access component (94.5%) and the LAGC IFQ component (5.5%).

Figure 1 – Scallop ACL flowchart with proposed 2022 OFL, ABC, and ACL values for FW34.



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 FY2022 OFL and ABC would be the default values adopted in Framework 33 (Table 2) that were calculated using fishery data through 2020. These default values would remain in place until a subsequent action replaced them. The OFL and ABC values were selected based on the scallop control rules of: 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 discards. Therefore, when the fishery specifications are set based on these limits (Table 3), the estimate of discards is removed first and allocations are based on the remaining ABC available (Table 2, column to the far right). There would be no OFL or ABC set for FY 2023.

Table 2 - No Action OFL and ABC for FY 2022 (default) approved through Framework 33 (values in mt).

Fishing Year	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2022	41,926	32,872	4,798	28,074

Table 3 – No Action (default) ACL related values for the scallop fishery based on 2022 OFL and ABC approved through Framework 33.

Catch limits	FY2022
Overfishing Limit	41,926
Acceptable Biological Catch/ACL (discards removed)	28,074
Incidental Catch (Estimated catch by LAGC Cat. C permits)	23
Research Set-Aside (RSA)	567
Observer Set-Aside	281
ACL for fishery	27,203
Limited Access ACL	25,707
LAGC Total ACL	1,496
LAGC IFQ ACL (5% of ACL)	1,360
Limited Access with LAGC IFQ ACL (0.5% of ACL)	136
Limited Access ACT (F=0.46)	22,279
Annual Projected Landings (APL)***	(*)
Limited Access Projected Landings (94.5% of APL)	(*)
Total IFQ Annual Allocation (5.5% of APL)	712
LAGC IFQ Annual Allocation (5% of APL)	648
Limited Access with LAGC IFQ Annual Allocation (0.5% of APL)	65

*The catch limits for the 2022 fishing year are subject to change through a future specifications action or framework adjustment. This includes the setting of an APL for 2022 that will be based on the 2021 annual scallop surveys.

**As a precautionary measure, the 2022 IFQ annual allocations are set at 75% of the 2021 IFQ Annual Allocations.

***The APL value reflects the Council's preferred alternatives for specifications from FW33.

4.1.2 Alternative 2 – Updated OFL and ABC for FY 2022 and FY 2023 (default)

Alternative 2 would specify OFLs and ABCs for FY 2022 and set default values for FY 2023 (Table 4). The fishing mortality rates for OFL and ABC would be based on the results of the 2020 management track assessment for Atlantic sea scallops. The fishing mortality rate associated with the OFL would be F=0.61, while the F associated with the ABC would be F=0.45.

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: This alternative utilizes the most recent scallop survey data and represents the most up-to-date scientific information available which is important when setting the OFL and ABC. While the scallop resource is considered healthy and has been relatively stable in recent years, some annual variability in exploitable biomass is anticipated.

Table 4 – Alternative 2 OFL and ABC values for FY 2022 and FY 2023 (default).

Fishing Year	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2022	38,271	30,305	4,581	25,724
2023	34,941	27,606	4,406	23,200

Table 5 - Alternative 2 ACL & APL related values for the scallop fishery based on 2022 and 2023 OFL and ABC.

	FY2022	FY2023
	mt	mt
OFL	38,271	34,941
ABC/ACL (discards removed)	25,724	23,200
Incidental Catch	23	23
RSA	578	578
Observer set-aside	257	232
ACL for fishery	24,865	22,367
Limited Access ACL	23,498	21,137
Limited Access ACT	20,365	18,318
LAGC Total ACL	1,368	1,230
LAGC IFQ ACL	1,243	1,118
LA w/ LAGC IFQ ACL (0.5% of ACL)	124	112
APL (after set-asides are removed)***		(*)
Limited Access Projected Landings (94.5% of APL)		(*)
Total IFQ Annual Allocation (5.5% of APL)		
LAGC IFQ Annual Allocation (5% of APL)		
Limited Access with LAGC IFQ Annual Allocation (0.5% of APL)		

*The catch limits for the 2023 fishing year are subject to change through a future specifications action or framework adjustment. This includes the setting of an APL for 2023 that will be based on the 2022 annual scallop surveys.

**As a precautionary measure, the 2023 IFQ annual allocations are set at 75% of the 2022 IFQ Annual Allocations.

***The APL value reflects the Council's preferred alternatives for specifications from FW34.

4.2 Action 2 – Northern Gulf of Maine Management and TAL Setting

Action 2 addresses management in the Northern Gulf of Maine Management Area (Map 1). In Framework 34, the Council recommends TAL setting for the management unit using the approach approved through Amendment 21 to the Scallop FMP.

4.2.1 Alternative 1 – No Action

Alternative 1 would set the total NGOM TAC for FY2022 at 74,000 pounds and would maintain the closure of Stellwagen Bank, as specified in the default measures for the NGOM through Framework 33. This alternative would not implement the changes to the NGOM management area made in Amendment 21, such as the updated allocation sharing arrangement that is described in Alternative 2.

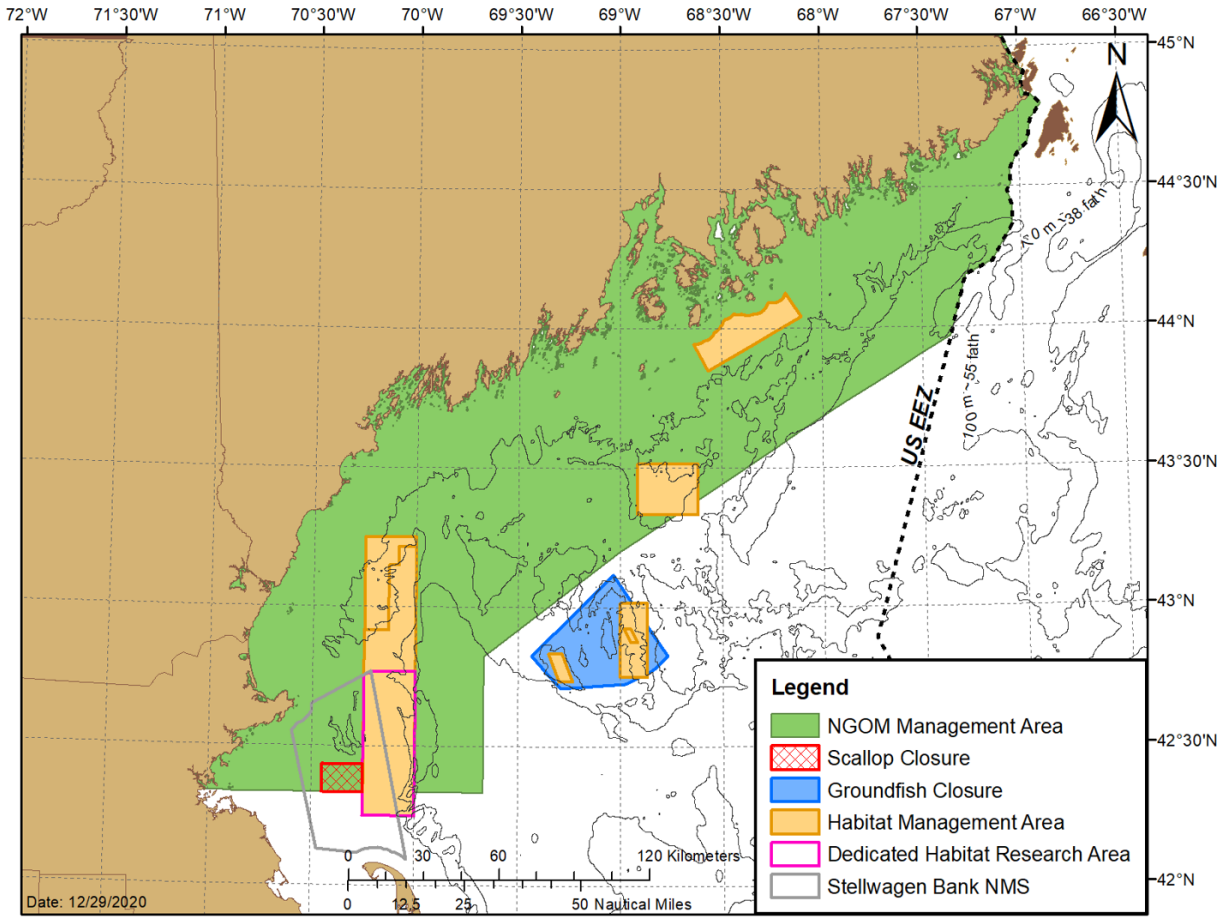
The overall NGOM TAC would be split between the LAGC and LA components, with 72,000 pounds available for directed fishing by the LAGC component at 200 pounds per day and 2,000 pounds available to be fished as research set-aside compensation by the limited access component (Table 6). The Stellwagen Bank closure area defined in Framework 33 would remain in place for the entirety of fishing year 2022. The NGOM management area would remain open for each component of the fishery (i.e., LA and LAGC) until their respective shares of the NGOM TAC have projected to have been caught, even if the other component has caught its share of the 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: Specifying a total NGOM TAC of 74,000 pounds and capping removals is consistent with the Council's problem statement established through Framework 29 and are the default measures set through Framework 33. This approach is intended to be a short term solution until Amendment 21 can be implemented to address NGOM issues more comprehensively.

Table 6 - The FY 2022 NGOM TAC under Alternative 1 - No Action (default measures from FW33).

Fishing Year	2022 TAC (lbs)
Overall TAC*	74,000
LA (RSA) TAC	2,000
LAGC TAC	72,000
*Subject to change after applying pound-for-pound payback of any 2021 fishery overages.	

Map 1 – The Northern Gulf of Maine Management Area relative to scallop closures, groundfish closures, habitat management areas, and the Stellwagen Bank National Marine Sanctuary. The Stellwagen Bank closure would remain in place for FY2022 under Alternative 1.



4.2.2 Alternative 2 – Re-open Stellwagen Bank and set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY2022 and FY2023 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Alternative 2 would also re-open the Stellwagen Bank closure area (see Map 1) to directed scallop fishing.

All options of Alternative 2 would set total allowable landings for all permit categories the management area, which would be reduced by 25,000 pounds to increase the overall scallop RSA (Table 7). The total allowable landings would also be reduced by 1% of the NGOM ABC (15,080 pounds) to support monitoring the directed scallop fishery in the NGOM (Table 7). The pounds deducted from the NGOM TAL would be added to the fishery-wide set-asides for research and monitoring. At or below the 800,000 pound trigger, the NGOM TAL would be allocated as NGOM Set-Aside, which would support directed LAGC fishing at 200 pounds per day. Over this value, the remaining NGOM TAL would be shared

between the NGOM annual projected landings (APL) (i.e., allocated to the limited access and LAGC IFQ components) and additional allocation for the NGOM set-aside. None of the NGOM TAL options of Alternative 2 exceed the 800,000 trigger; therefore, the remaining TAL after pounds are deducted for research and monitoring are allocated as NGOM Set-Aside for directed LAGC fishing (Table 7).

Fishing year 2023 default measures would be set at 75% of the 2022 NGOM Set-Aside value (Table 7).

Rationale: Alternative 2 would implement the changes to the Northern Gulf of Maine Management area made in Amendment 21 to the Scallop FMP. Alternative 2 is expected promote resource conservation by implementing measures adopted by the Council in Amendment 21 to the FMP. This includes setting limits on total removals from the NGOM and implementing accountability measures for all permit categories fishing in the area. The NGOM Set-Aside approach preserves and supports a directed LAGC fishery in federal waters in the NGOM and distributes the NGOM TAL to all permit types as the biomass in the area grows.

4.2.2.1 Option 1 - Set NGOM TAL at F=0.15

The overall NGOM TAL would be set by applying a fishing mortality rate of F=0.15 to the exploitable biomass on Stellwagen Bank. Under Option 1, the TAL for FY2022 would be set at 559,974 pounds, and the NGOM Set-Aside would be set at 519,895 pounds. The 2023 default NGOM Set-Aside would be set at 389,921 pounds.

4.2.2.2 Option 2 – Set NGOM TAL at F=0.18

The overall NGOM TAL would be set by applying a fishing mortality rate of F=0.18 to the exploitable biomass on Stellwagen Bank. Under Option 2, the TAL for FY2022 would be 661,387 pounds, and the NGOM Set-Aside would be set at 621,307 pounds. The 2023 default NGOM Set-Aside would be set at 465,980 pounds.

4.2.2.3 Option 3 – Set the NGOM TAL at F=0.2

The overall NGOM TAL would be set by applying a fishing mortality rate of F=0.20 to the exploitable biomass on Stellwagen Bank. Under Option 3, the TAL for 2022 would be set at 727,525 pounds, and the NGOM Set-Aside would be set at 687,446 pounds. The 2023 default NGOM Set-Aside would be set at 515,584 pounds.

Table 7 – Distribution of the NGOM TAL, set-asides, and default NGOM set-aside (2023) for Alternative 2 Options 1 – 3.

Section	4.2.2.1	4.2.2.2	4.2.2.3
Target F rate	F=0.15	F=0.18	F=0.20
2022 Total Allowable Landings	559,974	661,387	727,525
1% NGOM ABC for Observers	15,080	15,080	15,080
2022 RSA Contribution	25,000	25,000	25,000
2022 NGOM Set-Aside	519,895	621,307	687,446
2023 Default NGOM Set-Aside	389,921	465,980	515,584

4.3 ACTION 3 - FISHERY SPECIFICATIONS AND ROTATIONAL MANAGEMENT

Allocations to the LA (94.5%) and LAGC IFQ (5.5%) components allocations are based on Annual Projected Landings (APL). A summary of APL estimates by the specification alternatives considered in this action are provided in Table 8.

Table 8 - Comparison of allocations and DAS associated with each specification alternative in FW34. Sensitivity options are presented in gray text for 22 DAS and 24 DAS options for each alternative.

Section	Overall F	Open Area F/(DAS)	Annual Projected Landings (APL)	APL w/ set-asides removed	LA share (94.5%)	LAGC IFQ share (5.5%)
4.3.1	0.07	0.28 (18)	19,940,812	17,319,516	16,366,942	952,573
4.3.2.1	0.23	0.34 (20)	31,667,199	29,045,903	27,448,379	1,597,525
4.3.2 22 DAS	0.23	0.39	33,150,910	30,529,615	28,850,486	1,679,129
4.3.2 24 DAS	0.24	0.42	34,605,961	31,984,665	30,225,509	1,759,157
4.3.2.2	0.24	0.47 (26)	36,030,147	33,408,852	31,571,365	1,837,487
4.3.3.1	0.23	0.33 (20)	31,649,562	29,028,267	27,431,712	1,596,555
4.3.3 22 DAS	0.23	0.37	33,142,092	30,520,796	28,842,152	1,678,644
4.3.3 24 DAS	0.24	0.39	34,039,373	31,418,077	29,690,083	1,727,994
4.3.3.2	0.25	0.45 (26)	36,043,375	33,422,079	31,583,865	1,838,214
4.3.4	0.27	0.3	33,686,634	31,065,338	29,356,744	1,708,594

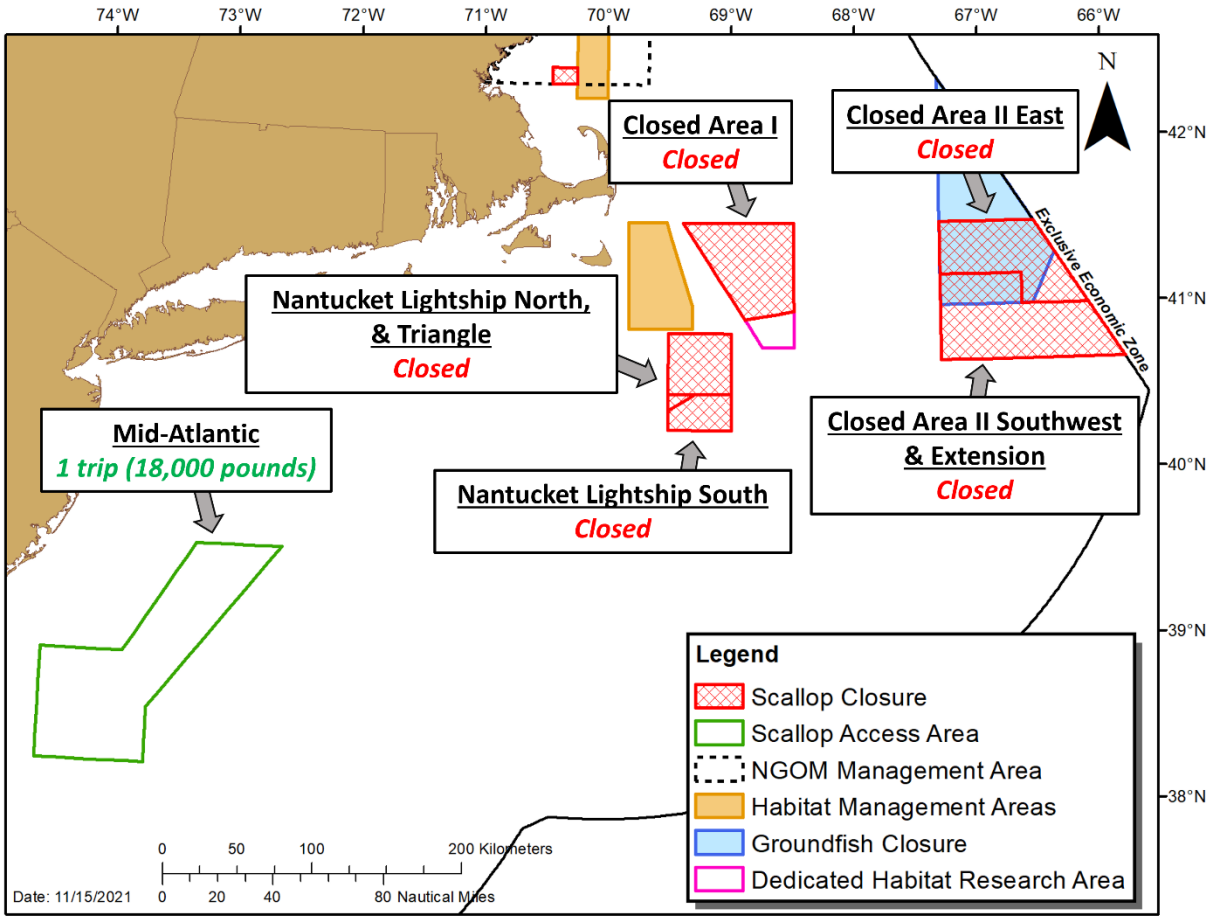
4.3.1 Alternative 1 – No Action (Default Measures)

Under Alternative 1 – No Action, the default specifications approved in Framework 33 would be effective for the 2022 fishing year and there would be no allocations specified for the 2023 fishing year. Default measures approved in Framework 33 include full-time Limited Access DAS set at 18, which are 75% of the DAS allocated for FY2021. Part-time Limited Access vessels would receive 7.2 DAS, and Occasional Limited Access vessels would be allocated 1.5 DAS. The FT LA component would be allocated one 18,000-pound trip in the Mid-Atlantic Access Area (Map 2).

Under the FW33 default measures for FY 2022, the total LAGC IFQ allocation would be 1,570,455 pounds, which is equivalent to 75% of the total LAGC IFQ allocation for FY2021. LAGC IFQ vessels would also have access in the Mid-Atlantic Access Area on April 1, 2022 under default measures, with a fleet wide maximum of 571 trips.

The target TAC for vessels with an LAGC Incidental permit would be 50,000 pounds.

Map 2 – Spatial management under Alternative 1 (No Action).



4.3.2 Alternative 2 – Three Access Area trips, with the Hudson Canyon closed and closures of the New York Bight and Nantucket Lightship West

Alternative 2 would allocate full-time limited access vessels access area trips to Closed Area II and the Nantucket Lightship South (Map 6) with a possession limit of 15,000 pounds. Each full time Limited Access vessel would be allocated a total of 45,000 pounds to the following access areas: Closed Area II (30,000 pounds) and the Nantucket Lightship South (15,000 pounds). There would be no direct allocations to the FT LA component to the Closed Area I Access Area, but the area would be available for RSA compensation fishing and for LAGC access area fishing.

Alternative 2 would maintain the Closed Area II Access Area configuration used in 2021 and would continue the closure of the eastern portion of the area (i.e., CAII-East) for the entire year (Map 6). Coordinates of the proposed Closed Area II Access Area (Southwest and Extension) are provided in Map 4 and coordinates of the proposed Closed Area II East closure are provided in Table 9.

Alternative 2 would maintain the 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 FY2022. The NLS-Triangle has an area of approximately 30 nmi^2 (101 km^2). Coordinates for the proposed NLS-Triangle closure are provided in Table 10.

Under Alternative 2, limited access vessels would be allowed to fish remaining FY2021 allocation in the Mid-Atlantic Access Area (MAAA) as defined in Framework 33 until May 30, 2022 (see Map 5). On May 31, 2022, the Hudson Canyon portion of the Mid-Atlantic Access Area (MAAA) would be closed to the scallop fishery and the Elephant Trunk portion of the MAAA would revert to open bottom, available to limited access vessels fishing days-at-sea and LAGC IFQ vessels on open trips (Map 3). Alternative 2 would establish the combined New York Bight (NYB)/Hudson Canyon (HC) closure as well as the Nantucket Lightship West (NLS-West) closure (Map 3). Vessels that are fishing FY2021 allocation in the MAAA may fish inside the part of the MAAA that overlaps with the NYB/HC for the first 60 days of the 2022 fishing year. Coordinates of the New York Bight/Hudson Canyon closure and NLS-West closure are provided in Table 11 and Table 12, respectively.

In a scenario where FW34 implementation is delayed after the start of the 2022 fishing year (April 1, 2022), if a vessels fishes any of its MAAA access area trip allocated as a default measure through FW33, that vessel would lose both of their Closed Area II AA trips allocated through FW34. This does not prohibit vessels from fishing the remainder of their FY2021 MAAA allocation (i.e. 1 trip at 18,000 pounds) during the first 60 days of FY2022.

The specific allocations associated with Alternative 2:

- The FY2022 Annual Projected Landings (APL) for this alternative are 29.1 million pounds (open area F=0.34, 20 DAS), or 33.4 million pounds (open area F=0.47, 26 DAS) before set-asides are accounted for (i.e., RSA, observer, NGOM). The Research Set-Aside, Observer Set-Aside, and incidental catch total for 2022 is 859 mt or 1.89 million pounds. The NGOM Set-Aside would be additive to these APL values based on the Council preferred option in Action 2 (Section 4.2).
- Each full-time limited access vessel would be allocated a total of 45,000 access area pounds. The FT LA trip limit would be set at 15,000 pounds in all available access areas: Closed Area II (Closed Area II Southwest and Closed Area II Extension combined) and the Nantucket Lightship South.
- FT LA vessels would be allowed to exchange access area allocations in all areas at increments of 7,500 pounds. All access area allocations could be exchanged at an increment of 7,500 pounds regardless of the initial allocation; for example, 7,500 pounds from the NLS-South could be exchanged for 7,500 pounds from CAII. There would be no change to how part-time vessels can exchange trips – those exchanges would still be done as 1:1 at the possession limit for this alternative (i.e., 9,000 pounds).
- For access area trips in the NLS-S, crew limits for LA vessels will be increased by 2 from the maximum crew limit in regulation. Full-time vessels will be allowed to have a maximum of 10 crew and part-time vessels will be allowed to have a maximum of 8 crew when fishing in the NLS-South.
- Access area allocations would be set at 18,000 pounds for part-time LA vessels, and 3,750 pounds for occasional LA vessels. The LA PT trip limit would be set at 9,000 pounds and PT vessels would receive one (1) CAII trip and one (1) Nantucket Lightship South trip. The LA Occasional trip limit would be set at 3,750 pounds, and Occasional vessels would be able to fish in their allocation in either the NLS-S or CAII.
- The LAGC incidental target TAC would be set at 50,000 lbs.
- Allocated LA access area trips would be available in the same access areas defined by Framework 34 for FY2022 and the first 60 days of FY2023, even if the area is scheduled to close

in FY 2023 (Map 4). Vessels planning to fish FY2022 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, 2023. For example, trips allocated to the NLS-S Access Area could only be fished in the access area boundary defined by FW34 during FY2022 or in the first 60 days of FY2023.

- FY2023 default measures under Alternative 2 would allocate FT LA vessels one (1) 15,000-pound access area trip to CAII. PT LA vessels would be allocated one (1) 9,000-pound access area trip to Closed Area II. For both full-time and part-time vessels, the default trip would be available on April 1, 2023. The LAGC IFQ component would also receive default access area trips to the Closed Area I, proportional to 5.5% of the default access area allocation to the FT LA component (i.e., 357 LAGC IFQ access area trips to CAI). The LAGC IFQ and LA DAS allocations would be set at 75% of the FY2022 allocations. The FY2023 default trips may be fished within the access areas as defined by FW34 (Map 4).

Rationale: Focusing the majority of access area effort in Closed Area II is in response to this rotational area containing the highest level of exploitable biomass in 2021. The continued closure of CAII-East is to optimize yield for the large year class of juvenile scallops that have been monitored by annual surveys in 2020 and 2021. Closing CAII-East for FY2022 will allow the juvenile scallops to grow in the absence of fishing and continue to be monitored through annual surveys. The majority of scallops in Closed Area II Access Area (Southwest and Extension) are considered exploitable and are supporting access area fishing in the current fishing year (i.e., FY2021). Maintaining the combined CAII-Southwest with CAII-Extension boundary is expected to allow for additional spatial flexibility given the dense aggregation of exploitable biomass that straddles the shared boundary.

The strongest signal of recruitment observed in the 2021 surveys was in the New York Bight area. Closing the New York Bight is expected to optimize growth of the several year classes contained within the closure area, ultimately to support scallop fishing in years following the 2022 fishing year. The Hudson Canyon has been an important and productive region for the scallop fishery; closing the Hudson Canyon area is intended to increase the chances of scallop settlement in this part of the resource.

A large set of young of the year scallops were observed in the 2021 surveys of the NLS-West. While these scallops were too small to be included in survey biomass estimates for 2021 (i.e., less than 40 mm), the growth potential for these juveniles is high should they survive over the next several years. Closing the NLS-West to scallop fishing is intended to support the growth of this year class of scallops in the absence of fishing pressure.

The 2021 surveys of the Mid-Atlantic Bight region observed a substantial drop in exploitable biomass in the Mid-Atlantic Access Area. While projections based on 2020 survey data suggested this area could support access area fishing in FY2022, observations from the 2021 surveys show minimal biomass remaining in this rotational area. Given the minimal biomass and absence of juvenile scallops observed in the 2021 surveys, the MAAA is candidate for re-opening. Maintaining the MAAA boundary through May 31, 2022 would allow for limited access vessels to harvest any remaining FY2021 MAAA allocation in the first 60 days of FY2022. Reverting the Elephant Trunk portion of the MAAA to open bottom on May 31, 2022 would provide more open area for vessels to fish under days-at-sea management or when fishing IFQ on open trips, should they choose to do so. Allowing open bottom fishing in the Elephant Trunk is also expected to offset the open area lost by establishing the New York Bight/Hudson Canyon closure area.

While the NLS-South scallops are sub-optimal operationally due to the slow growth and smaller size at age of scallops in this area, the NLS-South holds one of the largest exploitable biomass aggregations in the resource. Considering the high level of biomass in the area and acknowledging that the scallops will be 9 years old in FY2022, harvesting these scallops is necessary given the risk of foregoing exploitable biomass due to old age. The NLS-Triangle closure comprises a small area with low scallop densities that

could be used for research purposes in the absence of fishing. Continuation of the NLS-Triangle rotational area closure does not bind the Council to facilitating or supporting research in this area in any way.

There is not enough exploitable biomass in CAI to support a full or partial trip for the full-time limited access fleet in FY2022. Maintaining the CAI boundary and making it eligible for only LAGC IFQ AA trips and RSA compensation fishing will give both the LA and LAGC components an opportunity to fish there at a limited level if vessels elect to do so. This also creates a foundation for several alternatives in Section 4.3.3, which consider redistributing some or all CAII LAGC AA trips to Closed Area I.

Allowing FT LA access area allocations to be exchanged in increments of 7,500 pounds is consistent with how trip exchanges have been administered in recent years and is expected to increase flexibility for full-time limited access vessels. Allowing trip exchanges at 7,500-pound increments does not change the level of harvest expected from each access area but does allow additional flexibility to vessels that may wish to exchange access area allocations at a lower increment than the access area possession limit. Part time and occasional vessels are allowed to trade trips in full-trip increments but were not included in partial trip trading because they would receive equal trip allocations to the NLS-South and Closed Area II.

Map 3 – Spatial management under Alternative 2.

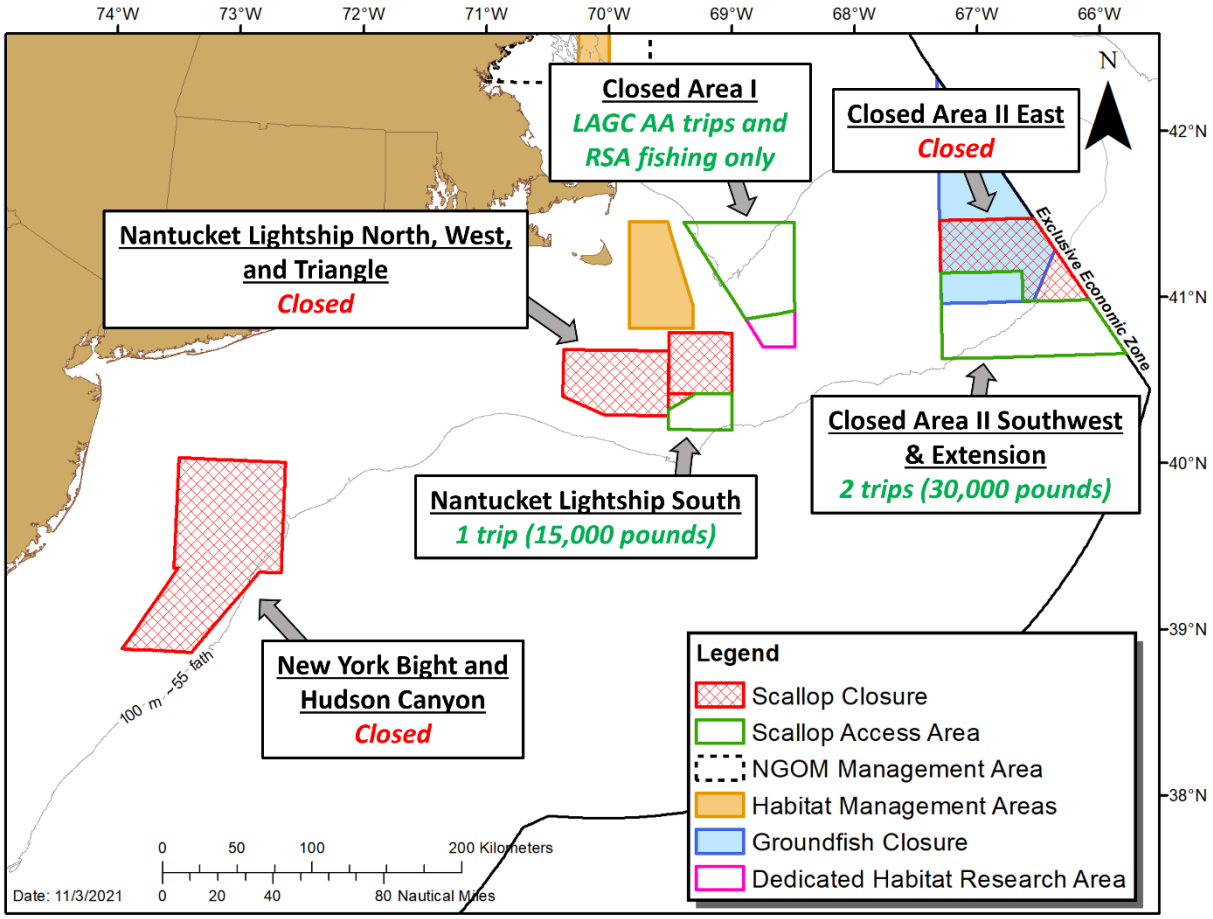


Table 9 – Coordinates of the Closed Area II East closure proposed under Alternative 2 and Alternative 3.

Point	Latitude	Longitude
1	41° 30' 0" N	67° 20' 0" W
2	41° 30' 0" N	(1)
3	41° 0' 0" N	(2)
4	41° 0' 0" N	66° 41' 0" W
5	41° 11' 0" N	66° 41' 0" W
6	41° 11' 0" N	67° 20' 0" W
7	41° 30' 0" N	67° 20' 0" W
(1) intersection of 41° 30' N and US-Canada Maritime Boundary (2) intersection of 41° 0' N and US-Canada Maritime Boundary		

Table 10 – Coordinates of the Nantucket Lightship Triangle closure proposed under Alternative 2 and Alternative 3.

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

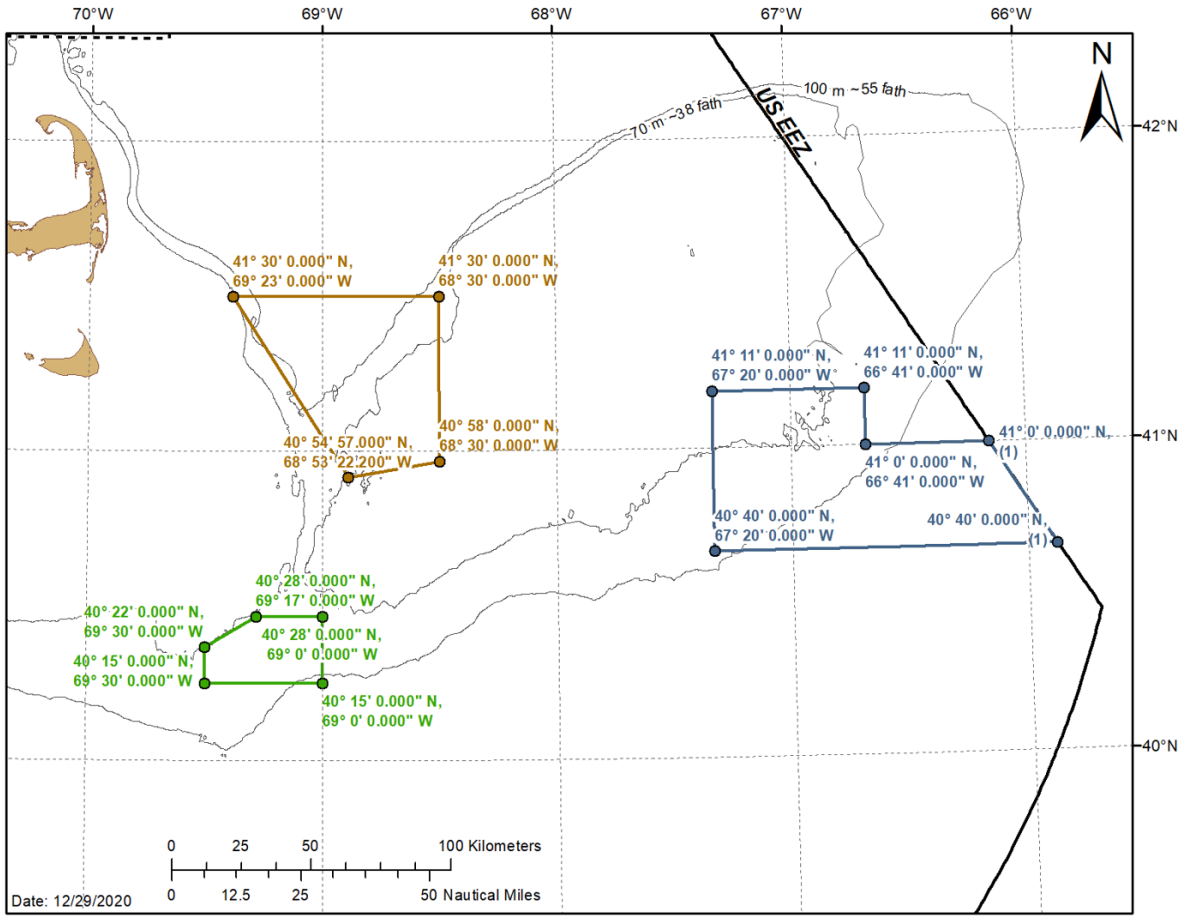
Table 11 – Coordinates of the New York Bight and Hudson Canyon closure proposed under Alternative 2.

Point	Latitude	Longitude
1	39° 20' 0" N	72° 40' 0" W
2	38° 50' 0" N	73° 10' 5.5128" W
3	38° 50' 0" N	73° 42' 0" W
4	39° 20' 0" N	73° 18' 1.7964" W
5	39° 20' 0" N	73° 20' 0" W
6	40° 00' 0" N	73° 20' 0" W
7	40° 00' 0" N	72° 30' 0" W
8	39° 20' 0" N	72° 30' 0" W

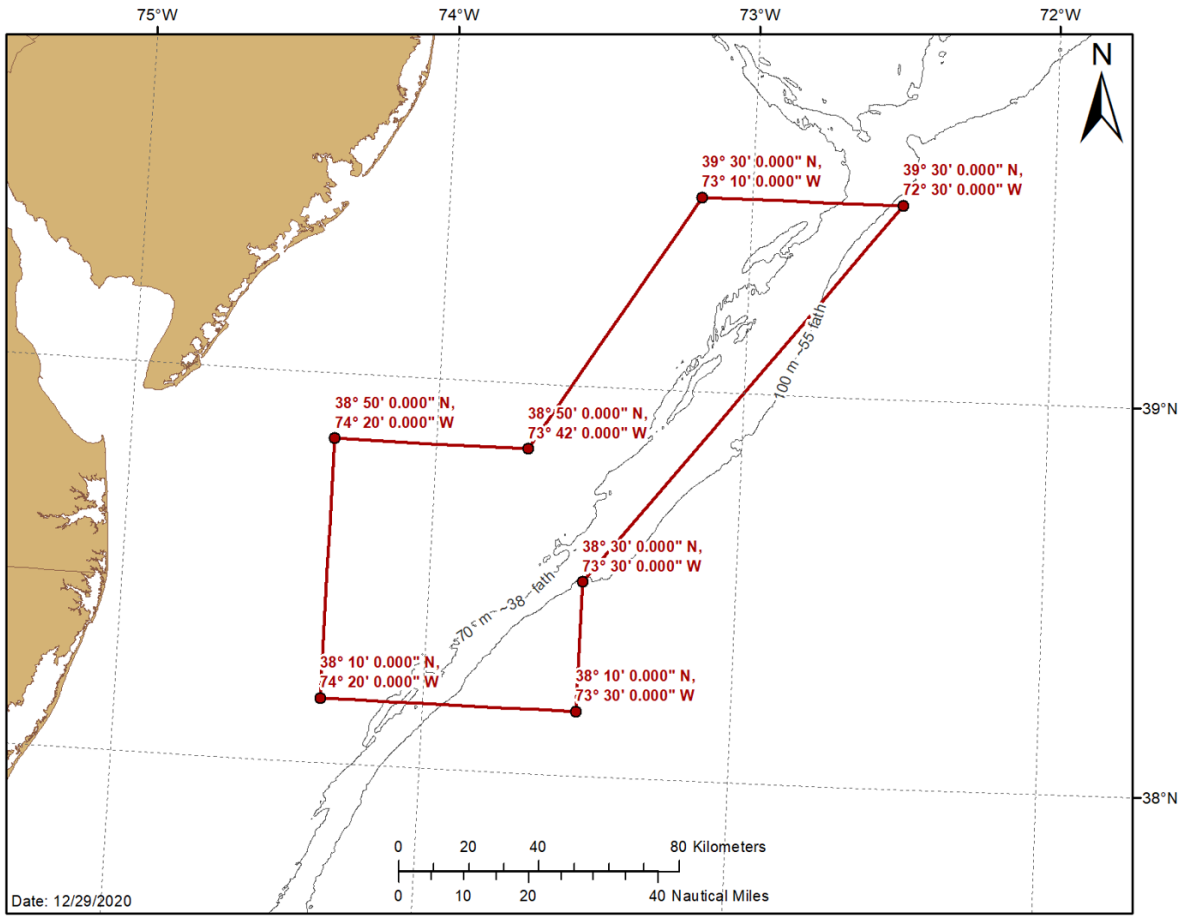
Table 12 – Coordinates of the Nantucket Lightship West closure proposed under Alternative 2 and Alternative 3.

Point	Latitude	Longitude
1	40° 43' 26.4" N	70° 20' 0" W
2	40° 43' 26.4" N	70° 00' 0" W
3	40° 43' 26.4" N	69° 30' 0" W
4	40° 20' 0" N	69° 30' 0" W
5	40° 20' 0" N	70° 00' 0" W
6	40° 26' 37.67"	70° 20' 0" W

Map 4 – Proposed rotational management configuration for areas on Georges Bank in Framework 34. Access area trips may be fished within the defined boundaries of FW34 for FY2022 and the first 60 days of FY2023. Note that Closed Area I is only available for LAGC IFQ access area fishing and RSA compensation fishing.



Map 5 – Boundary of the Mid-Atlantic Access Area as defined by Framework 33. Remaining FY2021 Mid-Atlantic Access Area allocation may be fished within these defined boundaries in the first 60 days of FY2022 (i.e., through May 30, 2022).



4.3.2.1 Option 1 – Open Areas Fished at F=0.34 (20 DAS)

Option 1 would set the full-time Limited Access DAS at 20, which is expected to result in an average open area fishing mortality rate of F=0.34 in open areas. The specific allocations associated with Alternative 2 Option 1 are described below:

- The APL after set-asides are removed would be 29,045,903 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,597,525 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,452,295 pounds. The FY 2023 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2022 value, which would be 1,198,144 pounds.
- DAS allocations for full-time, part-time, and occasional permits are shown in Table 13.

Table 13 – Summary of LA DAS allocations for each permit type at 20 DAS for FT LA vessels.

	FY 2022	FY 2023
FT LA	20	15
PT LA	8	6
Occasional	1.67	1.25

4.3.2.2 Option 2 – Open Areas Fished at F=0.47 (26 DAS)

Option 2 would set the full-time Limited Access DAS at 26, which is expected to result in an average open area fishing mortality rate of F=0.47 in open areas. The specific allocations associated with Alternative 2 Option 2 are described below:

- The APL after set-asides are removed would be 33,408,852 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,837,487 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,670,443 pounds. The FY 2023 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2022 value, which would be 1,378,115 pounds.
- DAS allocations for full-time, part-time, and occasional permits are shown in Table 14.

Table 14 - Summary of LA DAS allocation for each permit type at 26 DAS for FT LA vessels.

	FY 2022	FY 2023
FT LA	26	19.5
PT LA	10.4	7.8
Occasional	2.2	1.6

4.3.3 Alternative 3 – Three Access Area Trips, with the Hudson Canyon and Elephant Trunk reverted to open bottom and closures of the New York Bight and Nantucket Lightship West

Alternative 3 would allocate full-time limited access vessels access area trips to Closed Area II and the Nantucket Lightship South (Map 6) with a possession limit of 15,000 pounds. Each full time Limited Access vessel would be allocated a total of 45,000 pounds to the following access areas: Closed Area II

(30,000 pounds) and the Nantucket Lightship South (15,000 pounds). There would be no direct allocations to the FT LA component to the Closed Area I Access Area, but the area would be available for RSA compensation fishing and for LAGC access area fishing.

Alternative 2 would maintain the Closed Area II Access Area configuration used in 2021 and would continue the closure of the eastern portion of the area (i.e., CAII-East) for the entire year (Map 6). Coordinates of the proposed Closed Area II Access Area (Southwest and Extension) are provided in Map 4 and coordinates of the proposed Closed Area II East closure are provided in Table 9.

Alternative 3 would maintain the 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 FY2022. The NLS-Triangle has an area of approximately 30 nmi^2 (101 km^2). Coordinates for the proposed NLS-Triangle closure are provided in Table 10.

Under Alternative 3, limited access vessels would be allowed to fish their remaining FY2021 allocation in the Mid-Atlantic Access Area (MAAA) as defined in Framework 33 until May 30, 2022 (see Map 5). On May 31, 2022, the Mid-Atlantic Access Area (MAAA) would revert to open bottom and would be available to limited access vessels fishing days-at-sea and LAGC IFQ vessels on open trips (Map 6). Alternative 3 would establish the New York Bight (NYB) and Nantucket Lightship West (NLS-West) closure areas (Map 6). Vessels that are fishing FY2021 allocation in the MAAA may fish inside the part of the MAAA that overlaps with the NYB Closure for the first 60 days of the 2022 fishing year. Coordinates of the NYB closure and NLS-West closure are provided in Table 15 and Table 12, respectively.

In a scenario where FW34 implementation is delayed beyond the start of the 2022 fishing year (i.e., April 1, 2022), if a vessels fishes any of its MAAA access area trip allocated as a default measure through FW33, that vessel would lose both of their Closed Area II AA trips allocated through FW34. This does not prohibit vessels from fishing the remainder of their FY2021 MAAA allocation (i.e. 1 trips at 18,000 pounds) during the first 60 days of FY2022.

The specific allocations associated with Alternative 3:

- The FY2022 Annual Projected Landings (APL) for this alternative are 29.0 million pounds (open area F=0.33, 20 DAS), or 33.4 million pounds (open area F=0.45, 26 DAS) before set-asides are accounted for (i.e., RSA, observer, NGOM). The Research Set-Aside, Observer Set-Aside, and incidental catch total for 2022 is 859 mt or 1.89 million pounds. The NGOM Set-Aside would be additive to these APL values based on the Council preferred option in Action 2 (Section 4.2).
- Each full-time limited access vessel would be allocated a total of 45,000 access area pounds. The FT LA trip limit would be set at 15,000 pounds in all available access areas: Closed Area II (Closed Area II Southwest and Closed Area II Extension combined) and the Nantucket Lightship South.
- FT LA vessels would be allowed to exchange access area allocations in all areas at increments of 7,500 pounds. All access area allocations could be exchanged at an increment of 7,500 pounds regardless of the initial allocation; for example, 7,500 pounds from the NLS-South could be exchanged for 7,500 pounds from CAII. There would be no change to how part-time vessels can exchange trips – those exchanges would still be done as 1:1 at the possession limit for this alternative (i.e., 9,000 pounds).
- For access area trips in the NLS-S, crew limits for LA vessels will be increased by 2 from the maximum crew limit in regulation. Full-time vessels will be allowed to have a maximum of 10 crew and part-time vessels will be allowed to have a maximum of 8 crew when fishing in the NLS-South.

- Access area allocations would be set at 18,000 pounds for part-time LA vessels, and 3,750 pounds for occasional LA vessels. The LA PT trip limit would be set at 9,000 pounds and PT vessels would receive one (1) CAII trip and one (1) Nantucket Lightship South trip. The LA Occ trip limit would be set at 3,750 pounds, and Occ vessels would be able to fish in their allocation in either the NLS-S or CAII.
- The LAGC incidental target TAC would be set at 50,000 lbs.
- Allocated LA access area trips would be available in the same access areas defined by Framework 34 for FY2022 and the first 60 days of FY2023, even if the area is scheduled to close in FY 2023 (Map 4). Vessels planning to fish FY2022 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, 2023. For example, trips allocated to the NLS-S Access Area could only be fished in the access area boundary defined by FW34 during FY2022 or in the first 60 days of FY2023.
- FY2023 default measures under Alternative 2 would allocate FT LA vessels one (1) 15,000-pound access area trip to CAII. PT LA vessels would be allocated one (1) 9,000-pound access area trip to Closed Area II. For both full-time and part-time vessels, the default trip would be available on April 1, 2023. The LAGC IFQ component would also receive default access area trips to the Closed Area I, proportional to 5.5% of the default access area allocation to the FT LA component (i.e., 357 LAGC IFQ access area trips to CAI). The LAGC IFQ and LA DAS allocations would be set at 75% of the FY2022 allocations. The FY2023 default trips may be fished within the access areas as defined by FW34 (Map 4)

Rationale: Focusing the majority of access area effort in Closed Area II is in response to this rotational area containing the highest level of exploitable biomass in 2021. The continued closure of CAII-East is to optimize yield for the large year class of juvenile scallops that have been monitored by annual surveys in 2020 and 2021. Closing CAII-East for FY2022 will allow the juvenile scallops to grow in the absence of fishing and continue to be monitored through annual surveys. The majority of scallops in Closed Area II Access Area (Southwest and Extension) are considered exploitable and are supporting access area fishing in the current fishing year (i.e., FY2021). Maintaining the combined CAII-Southwest with CAII-Extension boundary is expected to allow for additional spatial flexibility given the dense aggregation of exploitable biomass that straddles the shared boundary.

The strongest signal of recruitment observed in the 2021 surveys was in the New York Bight area. Closing the New York Bight is intended to optimize growth of the several year classes contained within the closure area, ultimately to support scallop fishing in years following the 2022 fishing year.

A large set of young of the year scallops were observed in the 2021 surveys of the NLS-West. While these scallops were too small to be included in survey biomass estimates for 2021 (i.e., less than 40 mm), the growth potential for these juveniles is high should they survive over the next several years. Closing the NLS-West to scallop fishing is intended to support the growth of this year class of scallops in the absence of fishing pressure.

The 2021 surveys of the Mid-Atlantic Bight region observed a substantial drop in exploitable biomass in the Mid-Atlantic Access Area. While projections based on 2020 survey data suggested this area could support access area fishing in FY2022, observations from the 2021 surveys show minimal biomass remaining in this rotational area. Given the minimal biomass and absence of juvenile scallops observed in the 2021 surveys, the MAAA is candidate for re-opening. Reverting the MAAA to open bottom on May 31, 2022 would allow for remaining FY2021 MAAA allocation to be harvested in the first 60 days of FY2022; reverting the MAAA to open bottom would provide more open area for vessels to fish under days-at-sea management or when fishing IFQ on open trips, should they choose to do so. Allowing open bottom fishing in the MAAA is also expected to offset the open area lost by establishing the New York Bight closure area.

While the NLS-South scallops are sub-optimal operationally due to the slow growth and smaller size at age of scallops in this area, the NLS-South holds one of the largest exploitable biomass aggregations in the resource. Considering the high level of biomass in the area and acknowledging that the scallops will be 9 years old in FY2022, harvesting these scallops is necessary given the risk of foregoing exploitable biomass due to old age. The NLS-Triangle closure comprises a small area with low scallop densities that could be used for research purposes in the absence of fishing. Continuation of the NLS-Triangle rotational area closure does not bind the Council to facilitating or supporting research in this area in any way.

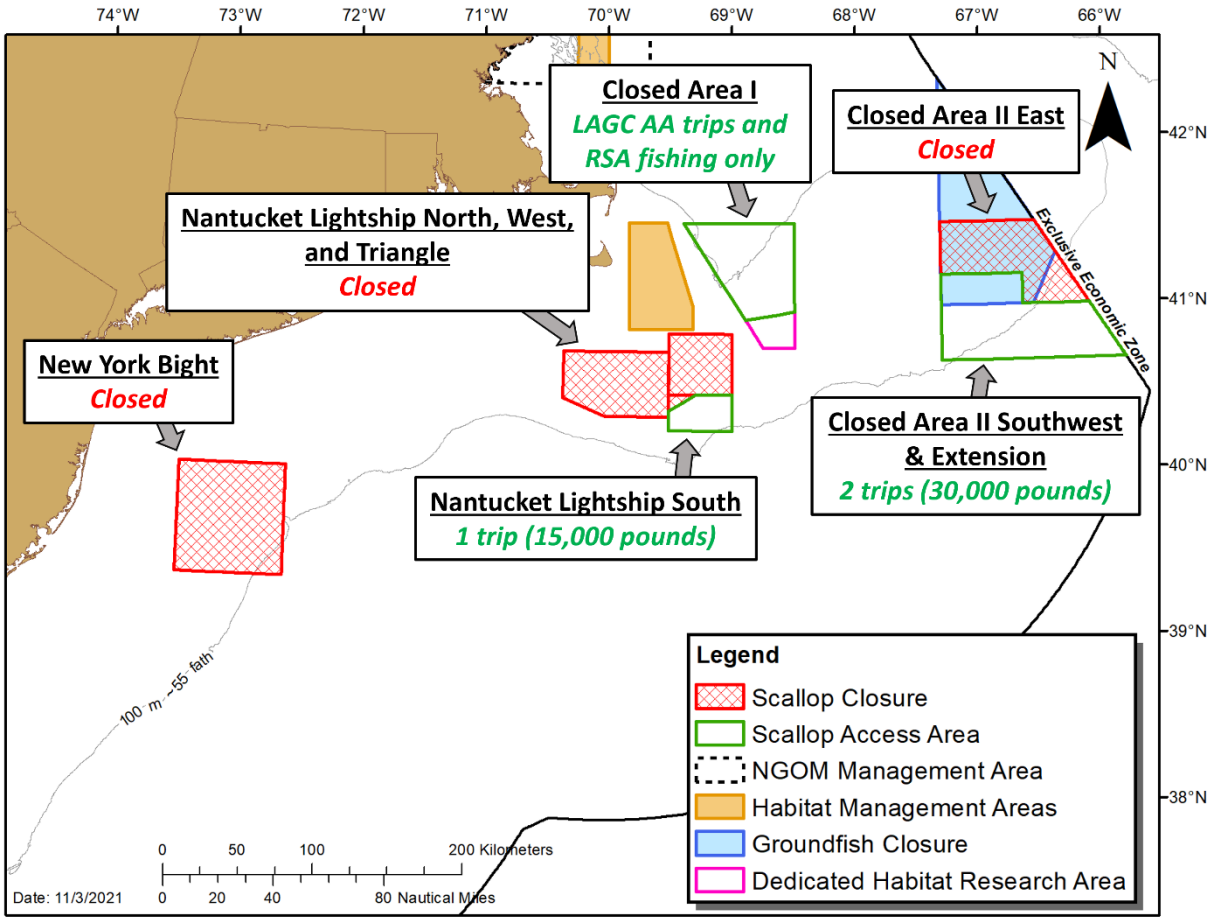
There is not enough exploitable biomass in CAI to support a full or partial trip for the full-time limited access fleet in FY2022. Maintaining the CAI boundary and making it eligible for only LAGC IFQ AA trips and RSA compensation fishing will give both the LA and LAGC components an opportunity to fish there at a limited level if vessels elect to do so. This also creates a foundation for several alternatives in Section 4.3.3, which consider redistributing some or all CAII LAGC AA trips to Closed Area I.

Allowing FT LA access area allocations to be exchanged in increments of 7,500 pounds is consistent with how trip exchanges have been administered in recent years and is expected to increase flexibility for full-time limited access vessels. Allowing trip exchanges at 7,500-pound increments does not change the level of harvest expected from each access area but does allow additional flexibility to vessels that may wish to exchange access area allocations at a lower increment than the access area possession limit. Part time and occasional vessels are allowed to trade trips in full-trip increments, but were not included in partial trip trading because they would receive equal trip allocations to the NLS-South and Closed Area II.

Table 15 – Coordinates of the New York Bight closure proposed under Alternative 3.

Point	Latitude	Longitude
1	40° 00' 0" N	73° 20' 0" W
2	40° 00' 0" N	72° 30' 0" W
3	39° 20' 0" N	72° 30' 0" W
4	39° 20' 0" N	73° 20' 0" W

Map 6 – Spatial management under Alternative 3.



4.3.3.1 Option 1 – Open Areas Fished at F=0.33 (20 DAS)

Option 1 would set the full-time Limited Access DAS at 20, which is expected to result in an average open area fishing mortality rate of F=0.33 in open areas. The specific allocations associated with Alternative 3 Option 1 are described below:

- The APL after set-asides are removed would be 29,028,267 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,596,555 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,451,413 pounds. The FY 2023 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2022 value, which would be 1,197,416 pounds.
- DAS allocations for full-time, part-time, and occasional permits are shown in Table 13.

4.3.3.2 Option 2 – Open Areas Fished at F=0.45 (26 DAS)

Option 2 would set the full-time Limited Access DAS at 26, which is expected to result in an average open area fishing mortality rate of F=0.45 in open areas. The specific allocations associated with Alternative 3 Option 2 are described below:

- The APL after set-asides are removed would be 33,422,079 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,838,214 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,671,104 pounds. The FY 2023 default LAGC IFQ quota (5.5%) would be set at 75% of the FY 2022 value, which would be 1,378,661 pounds.
- DAS allocations for full-time, part-time, and occasional permits are shown in Table 14.

4.3.4 Alternative 4 – Status Quo

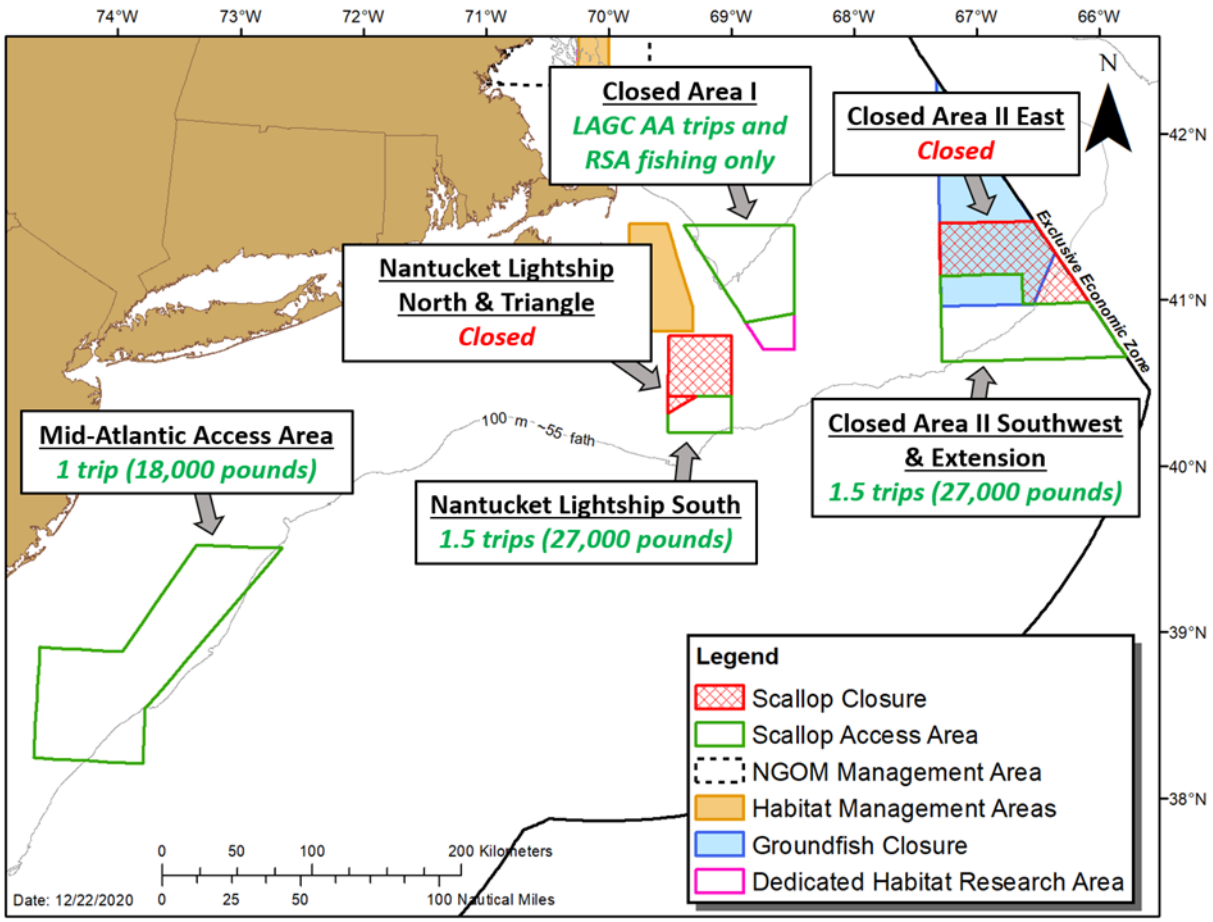
A description of the Framework 33 preferred specification measure is provided in the alternatives section of Framework 34 to provide continuity and context for the reader but is not an option proposed for Council decision. The allocations and spatial management measures that were approved for FY 2021 though Framework 33 are presented for a "status quo" comparison with updated spatial management alternatives. The impact analyses in this action (Section 6.0) 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 FW33 (i.e., partial allocations).

In Framework 34, the Status Quo run that is presented deviates from the modeling assumptions made in FW33 due to changes in scallop biomass and observations of incoming year classes. Therefore, Status Quo should not be considered an exact comparison to the FY2021 approach to spatial management.

Framework 33 allocated full-time limited access vessels a total access area allocation of 72,000 pounds per vessel and set the access area possession limit at 18,000 pounds per trip. The Council allocated trips to: the Mid-Atlantic Access Area (1 FT LA trips), Closed Area II Access Area (1.5 FT LA trip), and the Nantucket Lightship South access Area (1.5 FT LA trip) (Map 7). All FT LA access area allocations were allowed to be exchanged in 9,000-pound increments.

Fishing the open bottom at an F=0.30 would result in an allocation of 17.14 DAS in FY2022 (vs. 24 DAS in FY2021). Applying status quo spatial management in FY 2022 would be expected to result in an APL of 31 million pounds after set asides are removed, which is roughly 18% less than the 38 million pound APL associated with the same spatial management and open area F applied for FY2021.

Map 7 – Status Quo spatial management (FW33 allocations for FY2021).



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

4.4.1 Alternative 1 – No Action (Default measures from FW33)

Alternative 1 would set LAGC IFQ access area trips at 571 trips to the MAAA with a possession limit of 600-pounds per trip, which is the number of trips specified through default measures in Framework 33. 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 33 specified a set number of LAGC IFQ access area trips in default measures to provide LAGC IFQ vessels fishing opportunities should updated specifications for FY2022 be delayed. Default access area trip allocations for the LAGC IFQ component reflects the trip equivalent of 5.5% of the default access area allocation to the FT LA fleet.

4.4.2 Alternative 2 – Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation to Closed Area I Only

Under Alternative 2, the number of total access area trips allocated to the LAGC IFQ component would be the 800-pound trip equivalent of 5.5% of the access area allocation to the FT LA component specified in Section 4.3. When 5.5% is applied to the FT LA access area allocations for FY2022 (i.e., three (3) 15,000-pound allocations), the LAGC IFQ component would receive 1,071 trips with an 800-pound trip limit. This method has been used in previous actions and reflects the increased LAGC IFQ access area possession limit expected through implementation of Amendment 21 at the start of FY2022. Since there is only one access area configuration in Action 3, selecting an option in either 4.3.2 or 4.3.3 will result in the same number of LAGC IFQ access area trips.

Alternative 2 would allocate LAGC IFQ access area trips proportional to the LA allocations in each access area and would distribute the LAGC IFQ Closed Area II trip allocation exclusively to Closed Area I. As shown in Table 16, this would result in 714 LAGC IFQ access areas trips to Closed Area I and 357 LAGC IFQ access area trips to the NLS-South.

Rationale: The Closed Area II LAGC IFQ trip allocation would be distributed to the Closed Area I access area. This option would keep LAGC IFQ trips on Georges Bank proportional to the total FT LA access area allocation for Georges Bank. This approach leads to more opportunity for the LAGC IFQ to harvest scallops from access areas that can be fished by the day-boat fleet.

Table 16 – The distribution of LAGC IFQ access area trips under Alternatives in Action 4.

	Alt. 1	Alt. 2	Alt. 3
MAAA	571	0	0
NLS-S	0	357	714
CAI	0	714	357

4.4.3 Alternative 3 – Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation evenly across the Nantucket Lightship-South and Closed Area I

Under Alternative 3, the number of total access area trips allocated to the LAGC IFQ component would be the 800-pound trip equivalent of 5.5% of the access area allocation to the FT LA component specified in Section 4.3. When 5.5% is applied to the FT LA access area allocations for FY2022 (i.e., three (3) 15,000-pound allocations per FT LA vessel), the LAGC IFQ component would receive 1,071 trips with an 800-pound trip limit. This method has been used in previous actions and reflects the increased LAGC IFQ access area possession limit expected through implementation of Amendment 21 at the start of FY2022.

Alternative 3 would allocate LAGC IFQ access area trips proportional to the LA allocations in each access area and would distribute the LAGC IFQ Closed Area II trip allocation equally between Closed Area I and the NLS-South (Table 16). As shown in Table 16, this would result in 357 LAGC access areas trips to Closed Area I and 714 LAGC IFQ access area trips to the NLS-South.

Rationale: The Closed Area II LAGC IFQ trip allocation would be distributed to the Closed Area I access area. This option would keep LAGC IFQ trips on Georges Bank proportional to the total FT LA access area allocation for Georges Bank. This approach leads to more opportunity for the LAGC IFQ to harvest scallops from access areas that can be fished by the day-boat fleet.

4.5 Action 5 - Additional Measures to Reduce Fishery Impacts

4.5.1 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. This is the default measure.

4.5.2 Alternative 2 – Allow RSA compensation fishing in the NLS-South, Closed Area II, and Closed Area I, with limited RSA compensation fishing in the NGOM Management Area

Under Alternative 2, RSA compensation fishing would be permitted in the following areas in FY2022 (Map 8):

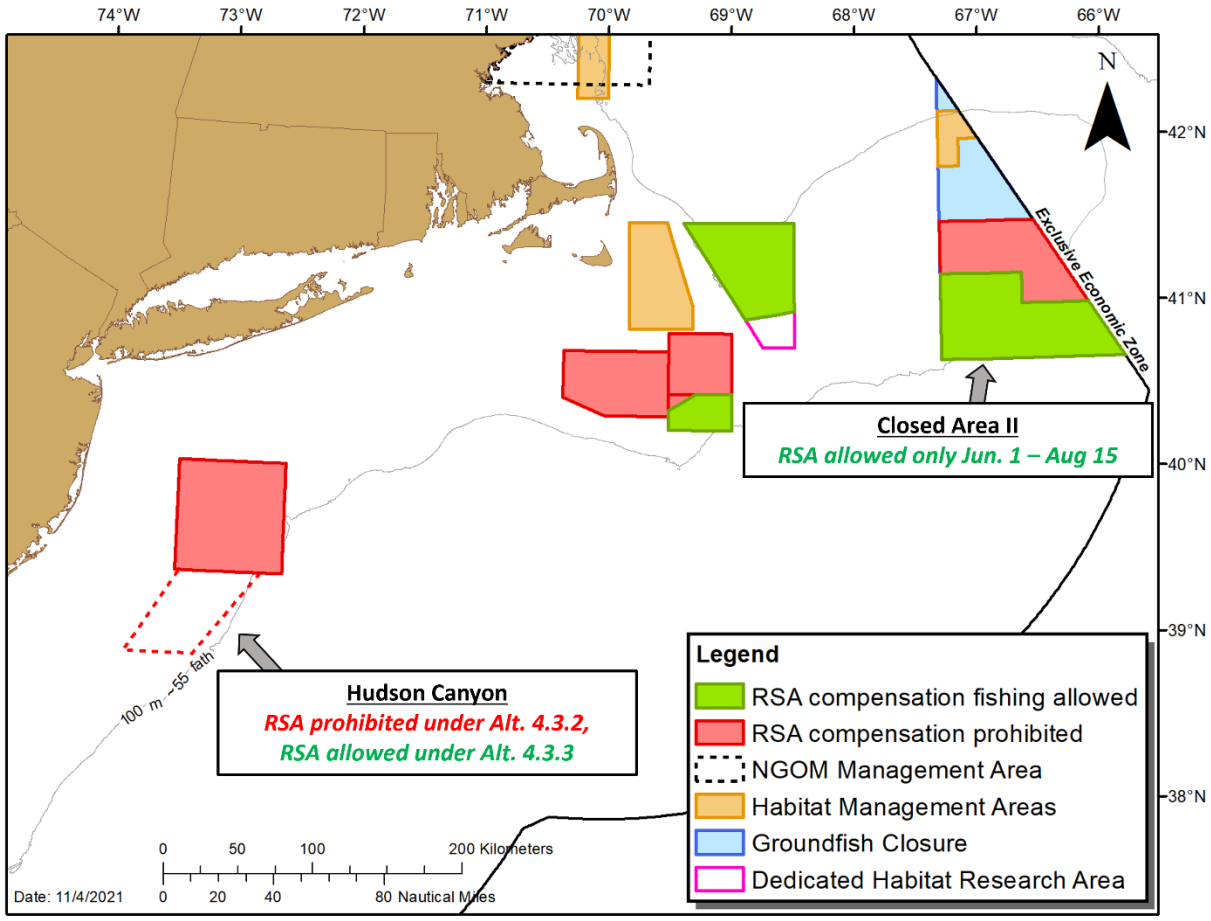
- Areas open to Limited Access DAS fishing (i.e., open bottom)
- Closed Area II, as defined in Section 4.3.2, from June 1, 2022 – August 15, 2022
- Closed Area I
- Nantucket Lightship-South
- NGOM Management area (up to 25,000 pounds in this area)

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

Vessels fishing RSA compensation seasonally in Closed Area II would not be permitted to fish in the area after 11:59 pm on August 14, 2021.

Rationale: This provision is intended to 1) Accurately account for scallop removals in the NGOM by restricting RSA compensation fishing to vessels that are eligible to harvest the 25,000 pound RSA contribution from the NGOM Set-Aside (i.e., set contribution to RSA per Amendment 21); 2) Facilitate access to high densities of scallops in access areas; 3) allow seasonal fishing in Closed Area II to reduce impacts on northern windowpane flounder and Georges Bank yellowtail flounder; 4) Allowing vessels to conduct compensation fishing in several areas is expected to distribute impacts of fishing more broadly, and provide vessels with flexibility.

Map 8 – Rotational access areas where RSA compensation fishing can and cannot occur in FY2022 under Alternative 2.



4.6 CONSIDERED BUT REJECTED ALTERNATIVES

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 was assessed through a management track assessment in 2020 (NEFSC 2020). The summary of the management track assessment can be found at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/population-assessments/2020-management-track-assessments

Overfishing is occurring if F is above F_{MSY}, and the stock is considered overfished if biomass is less than ½ B_{MSY}. The 2020 Management Track updated reference points and increased F_{MSY} to 0.61 and increased B_{MSY} to 102,675 mt (½ B_{MSY} = 51,329 mt). The 2020 management track assessment concluded that the scallop stock is neither overfished nor did it experience overfishing in 2019 (i.e., the terminal year of the assessment).

Figure 2 - Fully recruited annual fishing mortality rate for scallop from 1975 - 2019

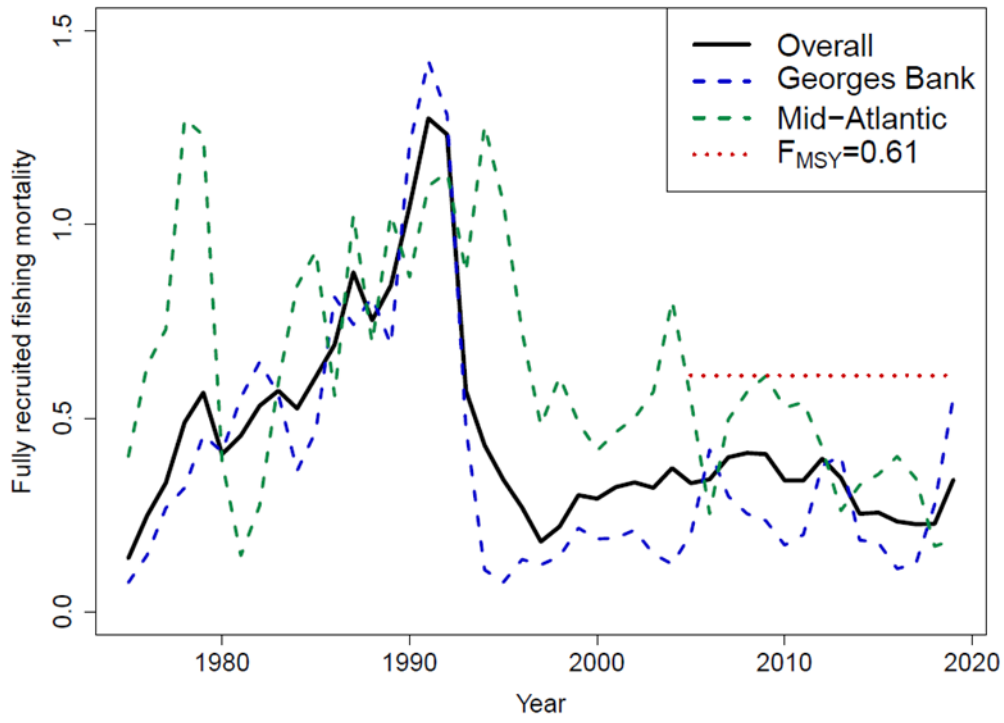


Table 17 - Atlantic sea scallop stock status from recent assessments.

	Definition in Scallop FMP	SARC 50 (2010)	SARC 59 (2014)	SARC 65 (2018)	2020 Management Track
OFL	F_{MSY}	F=0.38	F=0.48	F=0.64	F=0.61
ABC=ACL	25% probability of exceeding the OFL	F=0.32	F=0.38	F=0.51	F=0.45
B_{MSY}	B_{TARGET}	125,358 mt	96,480 mt	116,766 mt	102,657 mt
1/2 B_{MSY}	$B_{THRESHOLD}$	62,679 mt	48,240 mt	58,383 mt	51,329 mt
MSY		24,975 mt	23,798 mt	46,531 mt	32,079 mt
Overfished?	$B < B_{THRESHOLD}$	No	No	No	No
Overfishing?	$F < F_{THRESHOLD}=F_{MSY}$	No	No	No	No

5.2.2 Northern Gulf of Maine

In 2021, SMAST completed drop camera surveys of Ipswich Bay, Jeffreys Ledge, Platts Bank, and Stellwagen Bank. Maine Department of Marine Resources and University of Maine completed a dredge survey of Stellwagen Bank in 2021. Results of the 2021 drop camera survey and Maine DMR/UMaine dredge survey were used to project exploitable biomass and landings associated with a range of fishing mortality rates in FY2022 (see Table 18). See https://s3.amazonaws.com/nefmc.org/1.3-211007-Memo-PDT-to-SSC-RE-ABC-OFL-2022-2023.pdf

Table 18 –Projections of biomass, exploitable biomass, and landings associated with the range of F rates considered for 2021.

5.2.3 Summary of 2021 Scallop Surveys

See https://s3.amazonaws.com/nefmc.org/1.3-211007-Memo-PDT-to-SSC-RE-ABC-OFL-2022-2023.pdf

Figure 3 – The 2021 Georges Bank SAMS areas used for projections in FW34.

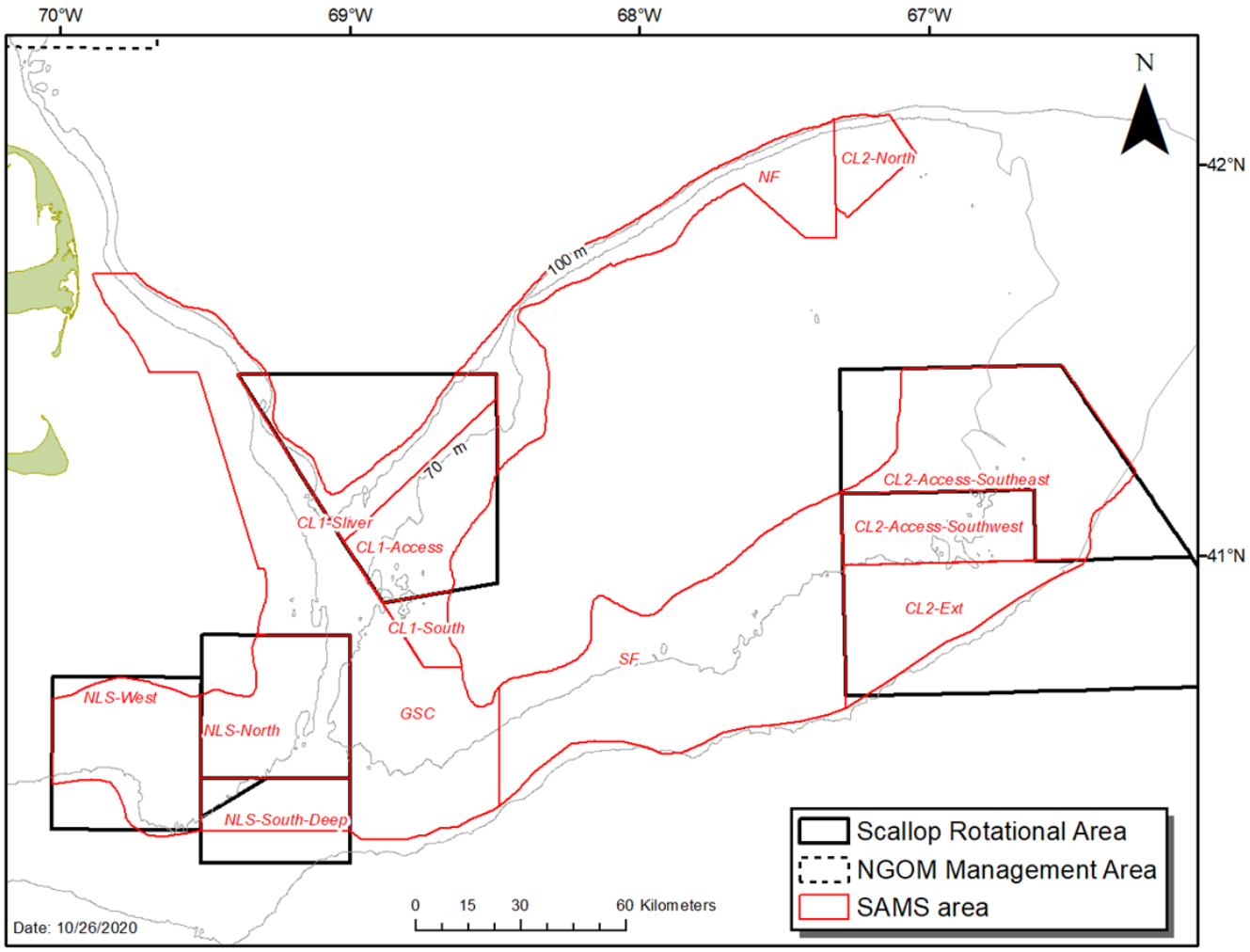
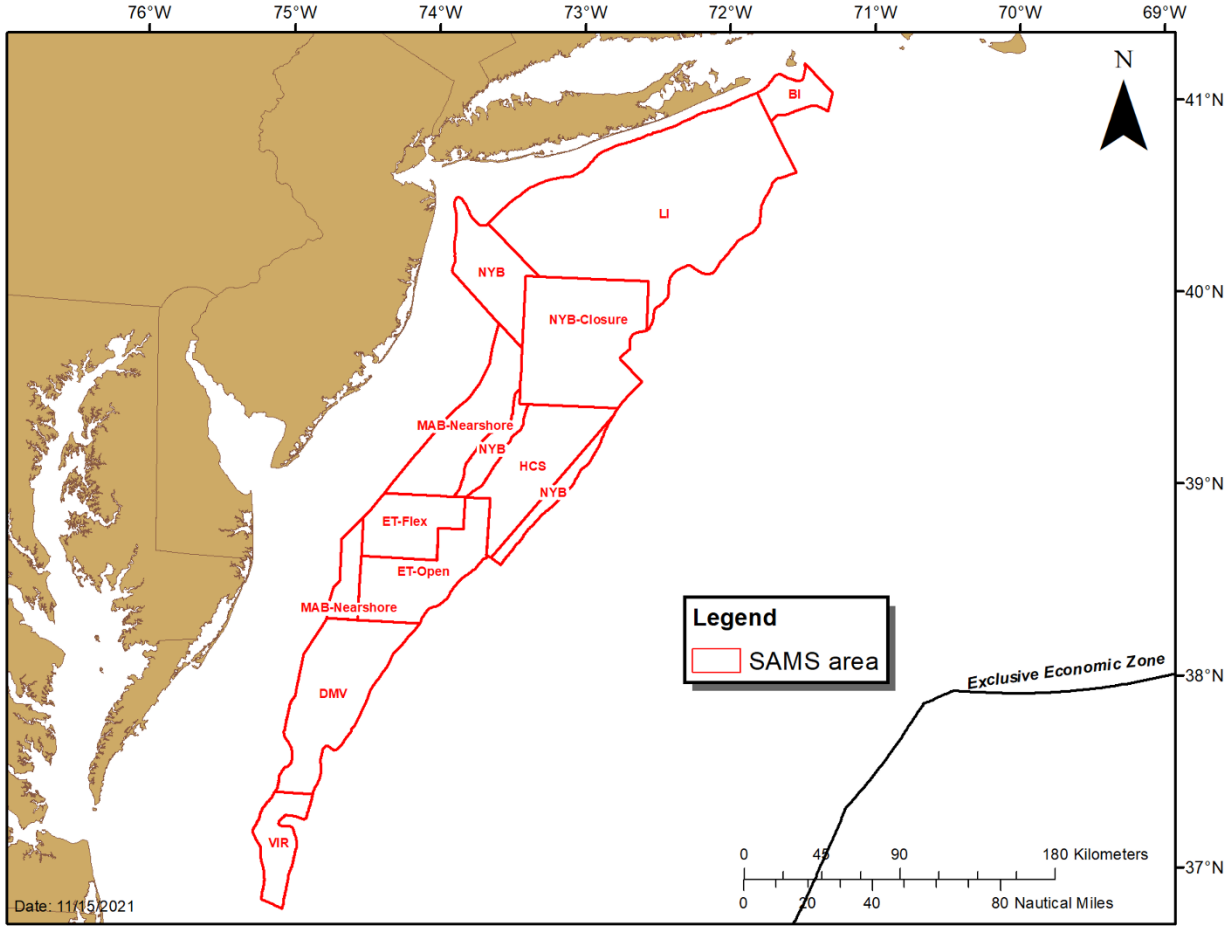


Figure 4 – The 2021 Mid-Atlantic SAMS Areas used for projections in FW34.



5.2.4 2021 Biomass Projections

See https://s3.amazonaws.com/nefmc.org/1.3-211007-Memo-PDT-to-SSC-RE-ABC-OFL-2022-2023.pdf

5.3 NON-TARGET SPECIES

Non-target species (sometimes referred to as incidental catch or bycatch) include species caught by scallop gear that are both landed and not landed, including small scallops. There are several measures in place that were designed to reduce bycatch including gear modifications, limits on effort, seasonal restrictions etc. In general, rotational area management is designed to improve and maintain high scallop yield, while minimizing impacts on groundfish mortality and other finfish catches. Access programs may even reduce fishing mortality for some finfish species because the total amount of fishing time in access areas is low compared with fishing time in open areas due to differences in LPUE. Incidental catch is sometimes higher in access areas compared to open areas, but in general total scallop landings are also usually higher in access areas.

Potential non-target species caught incidentally in the scallop fishery were identified in Amendment 15 and previous scallop framework actions based primarily on discard information from the 2009 SBRM report (NEFSC 2009) and various assessments such as GARM III and the Skates Data-poor Workshop. See Table 19 for the current status of these species, which has been updated based on Northeast Fisheries Science Center (NEFSC) assessment results through 2020[1], Skate FW3 (see Section 6.1.2), and Monkfish FW9 (see Section 6.1.2).

[1] NEFSC stock assessment results and supporting documentation can be accessed through the Stock Assessment Support Information (SASINF) portal at: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php

Table 19 – Status of non-target species known to be caught in scallop fishing gear, updated with assessment results through 2021.

Species or FMP	*Stock*	*Overfished?*	*Overfishing?*
Summer flounder (fluke)	Mid-Atlantic Coast	No	No
Monkfish	GOM/Northern GB	No	No
Monkfish	Southern GB/MA	No	No
Northeast Skate Complex	Barndoor skate	No	No
Northeast Skate Complex	Clearnose skate	No	No
Northeast Skate Complex	Little skate	No	No
Northeast Skate Complex	Rosette skate	No	No
Northeast Skate Complex	Smooth skate	No	No
Northeast Skate Complex	Thorny skate	Yes	No
Northeast Skate Complex	Winter skate	No	No
Multispecies	*Windowpane - GOM/GB	Unknown	No
Multispecies	*Windowpane - SNE/MA	No	No
Multispecies	Winter flounder - GB	Yes	No
Multispecies	Winter flounder - GOM	Unknown	No
Multispecies	Winter flounder - SNE/MA	Yes	No
Multispecies	Yellowtail flounder - CC/GOM	No	No
Multispecies	*Yellowtail flounder - GB	Unknown	Unknown
Multispecies	*Yellowtail flounder - SNE/MA	Yes	No
Atlantic Surfclam	Mid-Atlantic Coast	No	No
Ocean Quahog	Atlantic Coast	No	No

* stock has scallop fishery sub-ACL.

Updates available through NMFS's Stock Assessment Support Information (SASINF) portal: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php

5.3.1 Bycatch Species with sub-ACL Allocations

The only bycatch species with sub-ACLs for the scallop fishery are in the Northeast Multispecies plan: Georges Bank yellowtail flounder (GB yellowtail), Southern New England/Mid-Atlantic yellowtail flounder (SNE/MA yellowtail), southern windowpane flounder, and northern windowpane flounder. Table 20 summarizes anticipated catch limits of these four flatfish stocks for FY2022 as well as projected scallop fishery bycatch for FY2022. Table 21 describes a summary of sub-ACLs, projected bycatch, and realized bycatch from the scallop fishery from FY2013 – FY2020, as well as projected bycatch and sub-ACL allocations for FY2022. Out year bycatch projections can be uncertain because they are based on anticipated fishing behavior provided by SAMS model outputs; considering this, projections should be reviewed cautiously as past estimates have been both overestimated and underestimated relative to actual catch. A complete summary of all catch in the multispecies fishery can be found at:
https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/h/nemultispecies.html

Table 20 - Comparison of 2021 Scallop Fishery flatfish sub-ACLs (mt) with bycatch projections.

	OFL	US ABC	Scallop sub-ACL	2021 Bycatch Projections
Stock	**2022**	**2022**		
GB Yellowtail Flounder	unknown	122	18	15-19 mt
SNE/MA Yellowtail Flounder	71	22	2	2-3 mt
Northern Windowpane Flounder	unknown	160	33	86-115 mt
Southern Windowpane Flounder	513	384	129	73-82 mt

Table 21 – Comparison of recent flatfish sub-ACLs, scallop bycatch projections, and realized catch, FY2013-FY2021. Values are shown in mt.

FY		GBYT	SNE/MA YT	SWP	NWP
2013	sub-ACL	41.5	43.6	183	
	Projected	85.3	66	N/A	
	Actual	37.5	48.6	129.1	
2014	sub-ACL	50.9	66	183	
	Projected	62.4 - 103.7	61.1 - 67.7	74.4	
	Actual	59	63	136	
2015	sub-ACL	38	66	183	n/a
	Projected	27.9 - 48.6	54	134	45 - 94
	Actual	29.8	34.6	210.6	114.6
2016	sub-ACL	42	32	209	n/a
	Projected	26.3	40.4	179.2	88.1
	Actual	2	10.8	84.4	n/a
2017	sub-ACL	32	34	209	36
	Projected	62.8 - 63.2	10.66 - 11.9	77.85 - 85.08	102.1 - 103.33
	Actual	52.6	4.3	143.9	44.1
2018	sub-ACL	33	5	158	18
	Projected	11.7	4.2	261.7	50.7
	Actual	12.7	2.6	157.1	22.3
2019	sub-ACL	17	15	158	18
	Projected	11.48	2.9	64.03	8.02
	Actual	1.7	2.1	57.7	25.4
2020	sub-ACL	19	2	143	12
	Projected	23	2	143	33
	Actual	1.5	1	86	35
2021	sub-ACL	12	2	129	31
	Projected	16	3	72	29
	Actual	n/a	n/a	n/a	n/a

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 22 to facilitate consideration of the species most likely to interact with the scallop fishery relative to the preferred alternative.

Table 22. Protected species that may occur in the affected environment of the sea scallop fishery.

Species	Status	Potentially impacted 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
Oceanic whitetip shark (*Carcharhinus longimanus*)	Endangered	No
Giant Manta Ray (*Manta birostris)*	Threatened	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 22, 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 Impacted by the Alternatives Under Consideration

Based on available information, it has been determined that this action is not likely to impact any ESA listed or non-listed species of marine mammals (large whales, small cetaceans, or pinnipeds), or ESA-listed species of shortnose sturgeon, giant manta rays, oceanic white-tip sharks, Atlantic salmon, or hawksbill turtles. Further, this action is not likely to adversely modify or destroy designated critical habitats for the Northwest Atlantic Ocean DPS of loggerhead sea turtles or North Atlantic right whales. 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 (Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; MMPA List of Fisheries (LOF): https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries; NMFS Observer Program, unpublished data; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html). In the case of critical habitat, this determination has been made because the scallop fishery will not impact 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).

5.4.2 Species Potentially Impacted by the Alternatives Under Consideration

As noted in Table 22, ESA listed species of sea turtles and Atlantic sturgeon are the only protected species in the affected environment of the scallop fishery that have the potential to be adversely impacted by this fishery and the proposed Alternatives. To assist in making this determination, the June 17, 2021 Biological Opinion issued by NMFS on the operation of the scallop fishery was referenced (NMFS 2021). The 2021 Opinion, which considered the best available information on ESA listed species and observed or documented ESA listed species interactions with gear types used to prosecute the scallop fishery (e.g., scallop dredge and bottom trawl), concluded that the

scallop fishery, as authorized under the scallop FMP, may adversely affect, but is not likely to jeopardize the continued existence of the Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead, leatherback, Kemp's ridley, and the North Atlantic DPS of green sea turtles, as well as the five listed DPSs of Atlantic sturgeon. The Opinion included an incidental take statement authorizing the take of specific numbers of ESA listed species of sea turtles and Atlantic sturgeon over a five-year period. Reasonable and prudent measures and terms and conditions were also issued with the incidental take statement to minimize impacts of any incidental take.

To understand the potential risks that the 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, are provided.

5.4.2.1 Sea Turtles

5.4.2.1.1 Status and Trends

Four sea turtle species have the potential to be impacted by the proposed action: Northwest Atlantic Ocean DPS of loggerhead, Kemp's ridley, North Atlantic DPS of green, and leatherback sea turtles (Table 16). Although stock assessments and similar reviews have been completed for sea turtles none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species.

For the Northwest Atlantic Ocean DPS of loggerhead sea turtles, there are five unique recovery units that comprise the DPS. Nesting trends for each of these recovery units are variable; however, Florida index nesting beaches comprise most of the nesting in the DPS (https://myfwc.com/research/wildlife/sea-turtles/nesting/beach-survey-totals/). Overall, short-term trends for loggerhead sea turtles (Northwest Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (NMFS 2021).

For Kemp's ridley sea turtles, from 1980 through 2003, the number of nests at three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) increased 15 percent annually (Heppell et al. 2005); however, due to recent declines in nest counts, decreased survival of immature and adult sea turtles, and updated population modeling, this rate is not expected to continue and therefore, the overall trend is unclear (NMFS and USFWS 2015; Caillouett et al. 2018). In 2019, there were 11,090 nests, a 37.61% decrease from 2018 and a 54.89% decrease from 2017, which had the highest number (24,587) of nests; the reason for this recent decline is uncertain (see NMFS 2021). Given this and continued anthropogenic threats to the species, according to NMFS (2021), the species resilience to future perturbation is low.

The North Atlantic DPS of green sea turtle, overall, is showing a positive trend in nesting; however, increases in nester abundance for the North Atlantic DPS in recent years must be viewed cautiously as the datasets represent a fraction of a green sea turtle generation which is between 30 and 40 years (Seminoff et al. 2015). While anthropogenic threats to this species continue, taking into consideration the best available information on the species, NMFS (2021), concluded that the North Atlantic DPS appears to be somewhat resilient to future perturbations.

Leatherback turtle nesting in the Northwest Atlantic is showing an overall negative trend, with the most notable decrease occurring during the most recent time frame of 2008 to 2017 (NW Atlantic Leatherback Working Group 2018). The leatherback status review in 2020 concluded that leatherbacks are exhibiting an overall decreasing trend in annual nesting activity (NMFS & USFWS 2020). Given continued anthropogenic

threats to the species, according to NMFS (2021), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

5.4.2.1.2 Occurrence and Distribution

During the development of Framework 26 to the Scallop FMP in 2015, 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 is a summary of the information in FW26 with any updates since the issuance of the framework provided. For additional details on the sources of information used to develop this section, refer to Section 4.3.2.1 of Framework 26. Further 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; 2020), 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). In the portion of the scallop fishery operating in the NGOM, hard-shelled sea turtles are most likely to be present, and overlap with the scallop fishery from June through September; however, their presence, albeit lower, is still possible from October through December.

- **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).

5.4.2.1.3 Gear Interactions

As in Section 5.4.2.1.2, 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). Thus, sea turtles often occupy many of the same ocean areas used 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; c).

- **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 (FMRD 2016; 2017; 2018; Murray 2015a; 2021). There is insufficient data available to conduct a robust model-based analysis to estimate sea turtle interactions with scallop dredge gear outside the Mid-Atlantic. As a result, the bycatch estimates and the discussion below are based on observed sea turtle interactions in scallop dredge gear in the Mid-Atlantic. 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. Note, 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.

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 the chain-mat requirements, the average annual observable interactions of hard-shelled sea turtles and scallop dredge gear dropped to 20 turtles (95% CI=3-42; 3 adult equivalents; Table 23). Further, as stated by Murray (2011), "if the rate of observable interactions from dredges without chain mats had been applied to trips with chain mats, the estimated number of observable and inferred interactions of hard-shelled species after chain mats were

implemented would have been 125 turtles per year (95% CI: 88–163; 22 adult equivalents[2]; Table 23)." Most recently, Murray (2015a) estimated loggerhead interactions in the Mid-Atlantic scallop dredge fishery from 2009-2014. The average annual estimate of observable turtle interactions in scallop dredge gear was 11 loggerhead sea turtles per year (95% CI: 3-22; Murray 2015a). When the observable interaction rate from dredges without chain mats, was applied to trips that used chain mats and TDDs, the estimated number of loggerhead interactions (observable and unobservable but quantifiable) was 22 loggerheads per year (95% CI: 4-67; Murray 2015a). These 22 loggerheads equate to 2 adult equivalents per year, and 1-2 adult equivalent mortalities (Murray 2020a; Murray 2015a; 2021).

Most recently, Murray (2021) estimated loggerhead interactions in the Mid-Atlantic scallop dredge fishery from 2015-2019. The average annual estimate of loggerhead sea turtle interactions (observable and inferred) in scallop dredge gear was 155 loggerhead sea turtles per year (95% CI: 3-22; Murray 2015a), with 53 of these interactions being lethal. These 155 loggerheads equate to 31 adult equivalents per year, and 11 adult equivalent mortalities (Murray 2021). The estimated number of interactions from 2015-2019 is higher than in 2009-2014; however, Murray (2021) notes that there could be a number of reasons for this higher estimate. This includes, a higher number of dredge hours in the Mid-Atlantic (greater effort) between 2015-2019 compared to 2009-2014, as well as the analyses using a different method to estimate interactions compared to previous years estimates (i.e., used a stratified ratio estimator instead of a generalized additive model; Murray 2021).

Table 23. 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).

	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

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).

- **Sea Scallop Trawl Gear**

Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso and Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of our earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the Gulf of Maine, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the Gulf of Maine (Murray 2008; Murray 2015b; Murray 2020; NMFS Observer Program, unpublished data; Warden 2011 a, b). As few sea turtle interactions have been observed in the Gulf of Maine, there is insufficient data available to conduct a robust

[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).

model-based analysis and bycatch estimate of sea turtle interactions with trawl gear in this region .As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic and Georges Bank.

Murray (2020) provided information on sea turtle interaction rates from 2014-2018 (the most recent five-year period that has been statistically analyzed for trawls). Interaction rates were stratified by region, latitude zone, season, and depth. The highest loggerhead interaction rate (0.43 turtles/day fished) was in waters south of 37º N during November to June in waters greater than 50 meters deep. The greatest number of estimated interactions occurred in the Mid-Atlantic region north of 39º N, during July to October in waters less than 50 meters deep. Within each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

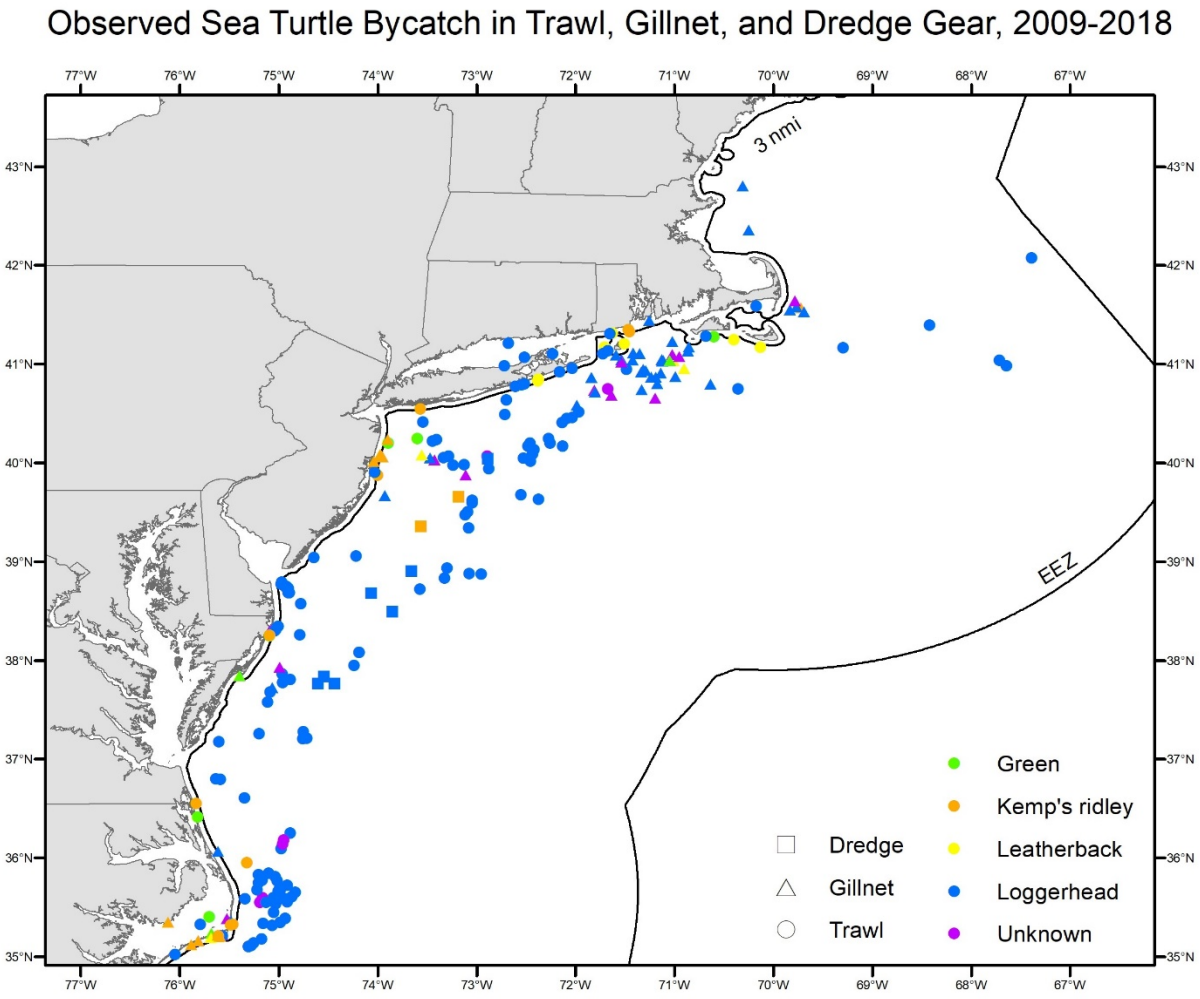
Based on Murray (2020)[3], from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI = 0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. On Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020b). _ENREF_100_ENREF_60_ENREF_55_ENREF_102_ENREF_60

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

Map 9 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 2009-2018. For additional information on observed sea turtle bycatch in years preceding 2009, see Section 4.3 of Framework 26 of the Scallop FMP.

[3] (Murray 2018; 2020b) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2015b; Murray & Orphanides 2013b; Warden 2011b), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be similar to those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007; Murray & Orphanides 2013b; Orphanides 2010).

Map 9. Observed location of turtle interactions in bottom tending gears in the Northeast Region (2009-2018).



5.4.2.2 Atlantic Sturgeon

5.4.2.2.1 Status and Trends

Atlantic sturgeon, from any DPS, are identified as having the potential to be impacted by the proposed action (Table 30). The ASMFC released a new benchmark stock assessment for Atlantic sturgeon in October 2017 (ASMFC 2017). Based on historic removals and estimated effective population size, the 2017 stock assessment concluded that all five Atlantic sturgeon DPSs are depleted relative to historical levels. However, the 2017 stock assessment does provide some evidence of population recovery at the coastwide scale, and mixed population recovery at the DPS scale (ASMFC 2017). The 2017 stock assessment also concluded that a variety of factors (i.e., bycatch, habitat loss, and ship strikes) continue to impede the recovery rate of Atlantic sturgeon (ASMFC 2017).

5.4.2.2.2 Atlantic Sturgeon 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 Atlantic sturgeon DPSs in the affected environment of the scallop

fishery. Below, is a summary of the information provided in FW 26, with any updates (i.e., literature) since the issuance of the framework provided. 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.

5.4.2.2.3 Gear Interactions

According to the NMFS Biological Opinion on the sea scallop fishery issued on June 17, 2021, 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 1989-2019 confirms this determination. No Atlantic sturgeon have been reported as caught in scallop bottom trawl gear where the haul target or trip target is scallops. However, NEFOP observer data has recorded one (1) Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NMFS 2021)(FMRD 2019).

5.5 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Ecosystem includes the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream to a depth of 2,000 m (Map 10) (Sherman et al. 1996). Four distinct sub-regions are identified: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The physical oceanography and biota of these regions were described in the Scallop Amendment 11. Much of this information was extracted from Stevenson et

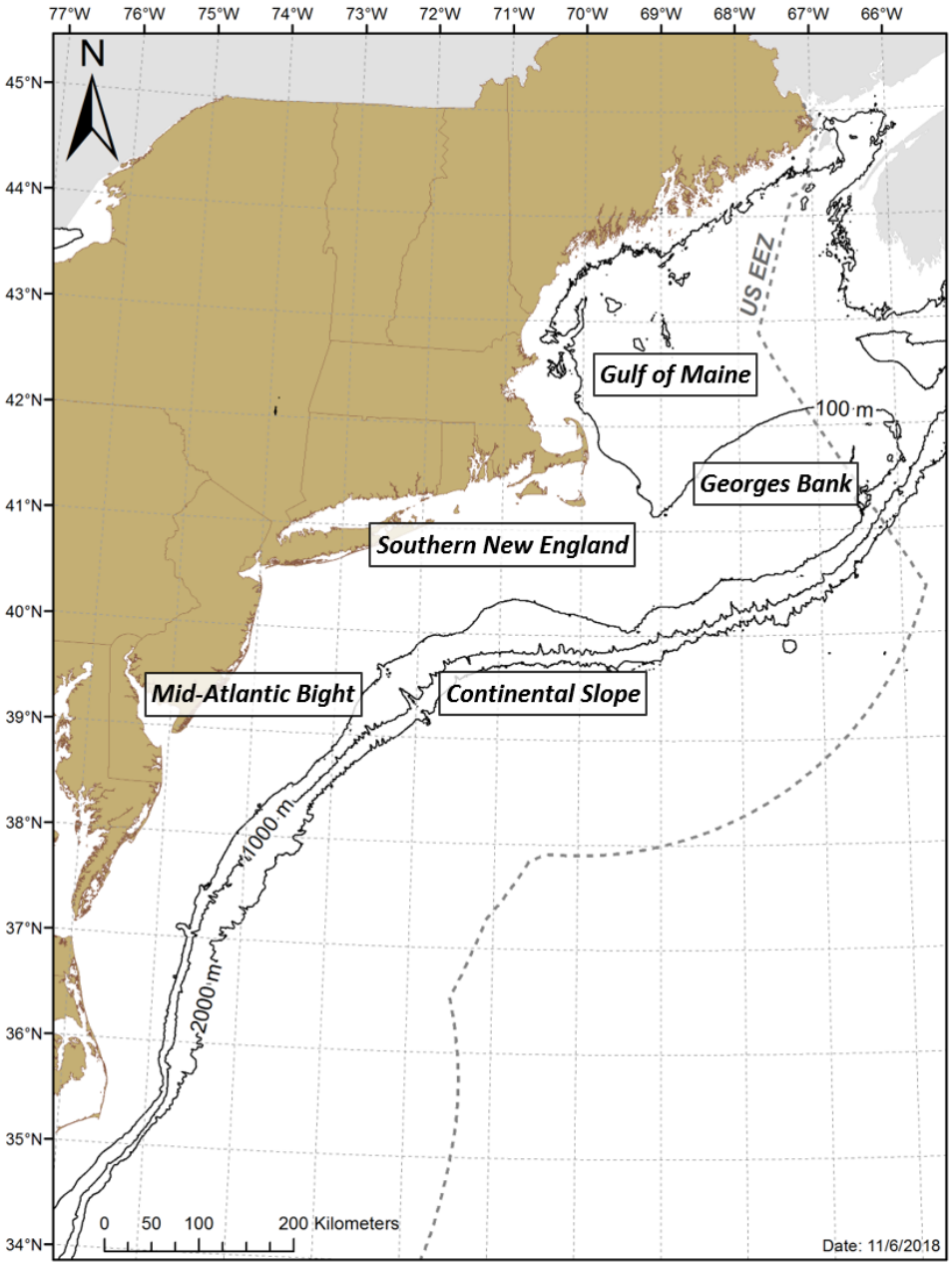
al. (2004), and the reader is referred to this document and sources referenced therein for additional information. Primarily relevant to the scallop fishery are Georges Bank and the Mid-Atlantic Bight, although some fishing also occurs in the Gulf of Maine.

The Atlantic sea scallop fishery is primarily prosecuted in concentrated areas in and around Georges Bank and off the Mid-Atlantic coast, in waters extending from the near-coast out to the edge of the continental shelf. Atlantic sea scallops occur primarily in depths less than 110 meters on sand, gravel, shells, and cobble substrates (Hart & Chute 2004). This area, which could potentially be affected by the preferred alternative, has been identified as EFH for various species. These species include American plaice, Atlantic cod, Atlantic halibut, Atlantic herring, Atlantic sea scallop, Atlantic surf clam, Atlantic wolfish, barndoor skate, black sea bass, clearnose skate, haddock, little skate, longfin squid, monkfish, ocean pout, ocean quahog, pollock, red hake, redfish, rosette skate, scup, silver hake, spiny dogfish, summer flounder, thorny skate, white hake, windowpane flounder, winter flounder, witch flounder, winter skate, and yellowtail flounder. Table 24 describes information on the geographic area, depth, and EFH description for each applicable life stage of these species. Map 11 displays the updated year-round and seasonal EFH areas for all NEFMC species and is consistent with the OHA2 measures approved by the NMFS on January 3, 2018. For more detailed descriptions of the approved OHA2 areas the reader is referred to the Council website (OHA2 FEIS, Vol. 2).

Another purpose of OHA2 was to evaluate existing habitat management areas and develop new habitat management areas. To assist with this effort, an analytical approach was developed to characterize and map habitats and to assess the extent to which different habitat types are vulnerable to different types of fishing activities. This body of work, termed the Swept Area Seabed Impact approach, includes a quantitative, spatially-referenced model that overlays fishing activities on habitat through time to estimate both potential and realized adverse effects to EFH. The approach is detailed in this document, available on the Council webpage:

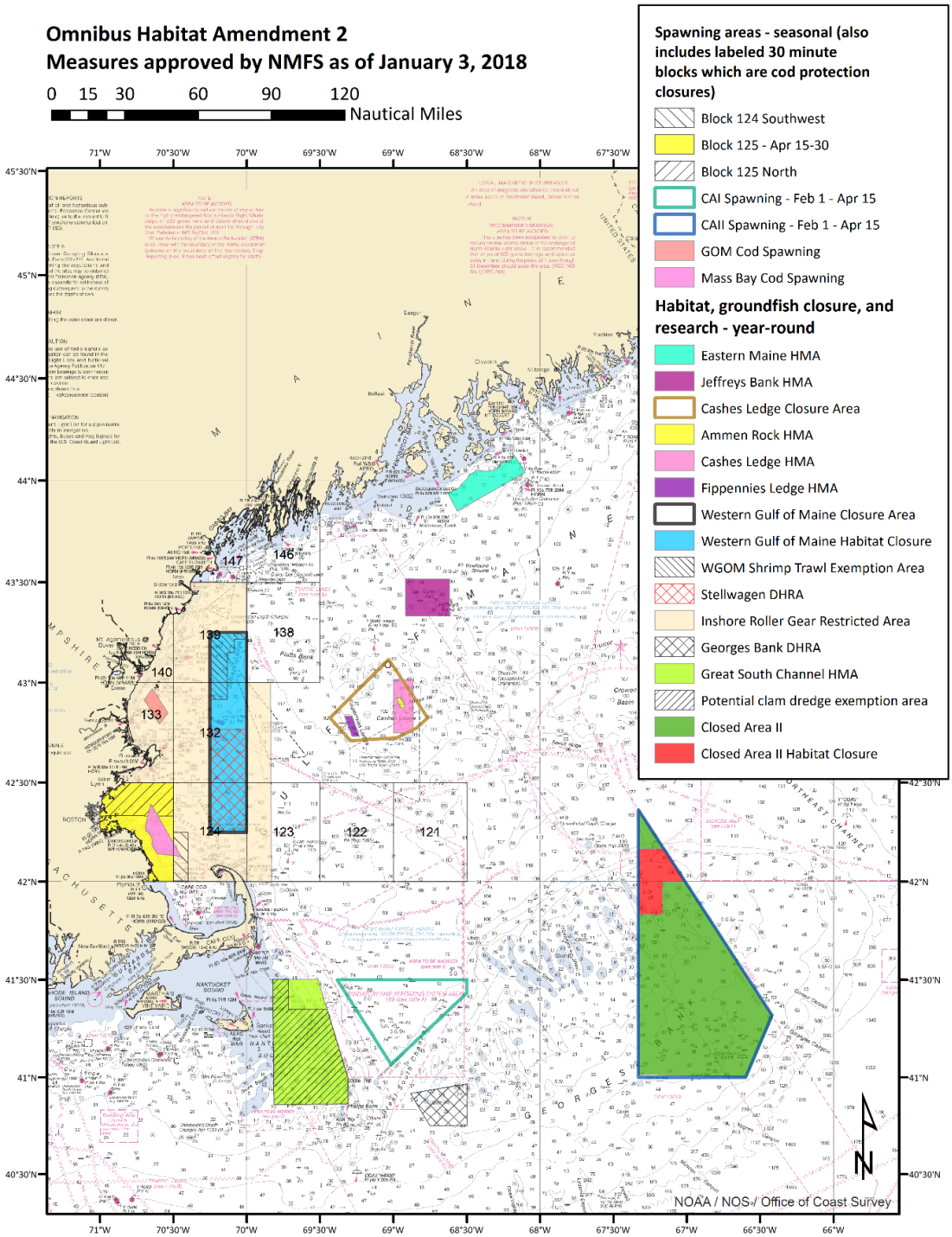
http://www.nefmc.org/habitat/planamen/efh_amend_2/appendices%20-%20dec2013/Appendix%20D%20-%20Swept%20Srea%20Seabed%20Impact%20approach.pdf.

Map 10 – Northeast U.S. Shelf Ecosystem and geographic extent of the US sea scallop fishery.



The Council identified final recommendations for modifications to habitat management areas over two Council meetings, April 2015 and June 2015. On October 6, 2017 the NMFS published a notice of availability of OHA2 and requested public comments for the agency to consider in the approval/disapproval decision on the amendment (50 CFR §648, 2017), and a proposed rule for OHA2 was published on November 6, 2017 (50 CFR §648, 2017). A final decision regarding OHA2 was published by the NMFS on January 3, 2018, with implementation of the amendment on April 9, 2018. A summary of the Council's preferred recommendations can be found at www.nefmc.org, and Map 11 is included below with the approved habitat management areas and seasonal spawning areas.

Map 11 – Approved OHA2 measures, including year-round spatial management areas and seasonal spawning areas. Note the scallop fishery is exempt from the Inshore Roller Gear Restricted Area (shown in tan blocks) and CAI seasonal closure.



Map credit - New England Fishery Management Council, January 4, 2018

Table 24 – Geographic distributions and habitat characteristics of Essential Fish Habitat designations for benthic fish and shellfish species managed by the New England and Mid-Atlantic fishery management councils in depths less than 100 meters in the Greater Atlantic region, up-dated January 2018.

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Acadian redfish	Juveniles	Gulf of Maine and the continental slope north of 37°38'N	50-200 in Gulf of Maine, to 600 on slope	Sub-tidal coastal and offshore rocky reef substrates with associated structure-forming epifauna (e.g., sponges, corals), and soft sediments with cerianthid anemones
Acadian redfish	Adults	Gulf of Maine and the continental slope north of 37°38'N	140-300 in Gulf of Maine, to 600 on slope	Offshore benthic habitats on finer grained sediments and on variable deposits of gravel, silt, clay, and boulders
American plaice	Juveniles	Gulf of Maine and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-180	Sub-tidal benthic habitats on mud and sand, also found on gravel and sandy substrates bordering bedrock
American plaice	Adults	Gulf of Maine, Georges Bank and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-300	Sub-tidal benthic habitats on mud and sand, also gravel and sandy substrates bordering bedrock

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Atlantic cod	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including nearshore waters from eastern Maine to Rhode Island and the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	Mean high water-120	Structurally-complex intertidal and sub-tidal habitats, including eelgrass, mixed sand and gravel, and rocky habitats (gravel pavements, cobble, and boulder) with and without attached macroalgae and emergent epifauna
Atlantic cod	Adults	Gulf of Maine, Georges Bank, Southern New England, and the Mid-Atlantic to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	30-160	Structurally complex sub-tidal hard bottom habitats with gravel, cobble, and boulder substrates with and without emergent epifauna and macroalgae, also sandy substrates and along deeper slopes of ledges
Atlantic halibut	Juveniles & Adults	Gulf of Maine, Georges Bank, and continental slope south of Georges Bank	60-140 and 400-700 on slope	Benthic habitats on sand, gravel, or clay substrates
Atlantic herring	Eggs	Coastal Gulf of Maine, Georges Bank, and Southern New England	5-90	Sub-tidal benthic habitats on coarse sand, pebbles, cobbles, and boulders and/or macroalgae
Atlantic sea scallop	Eggs	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Inshore and offshore benthic habitats (see adults)

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Atlantic sea scallop	Larvae	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	No information	Inshore and offshore pelagic and benthic habitats: pelagic larvae ("spat"), settle on variety of hard surfaces, including shells, pebbles, and gravel and to macroalgae and other benthic organisms such as hydroids
Atlantic sea scallop	Juveniles	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats initially attached to shells, gravel, and small rocks (pebble, cobble), later free-swimming juveniles found in same habitats as adults
Atlantic sea scallop	Adults	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats with sand and gravel substrates
Atlantic surfclams	Juveniles and adults	Continental shelf from southwestern Gulf of Maine to Cape Hatteras, North Carolina	Surf zone to about 61, abundance low >38	In substrate to depth of 3 ft
Atlantic wolffish	Eggs	U.S. waters north of 41˚N latitude and east of 71˚W longitude	<100	Sub-tidal benthic habitats under rocks and boulders in nests
Atlantic wolffish	Juveniles	U.S. waters north of 41˚N latitude and east of 71˚W longitude	70-184	Sub-tidal benthic habitats

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Atlantic wolffish	Adults	U.S. waters north of 41˚N latitude and east of 71˚W longitude	<173	A wide variety of sub-tidal sand and gravel substrates once they leave rocky spawning habitats, but not on muddy bottom
Barndoor skate	Juveniles and adults	Primarily on Georges Bank and in Southern New England and on the continental slope	40-400 on shelf and to 750 on slope	Sub-tidal benthic habitats on mud, sand, and gravel substrates
Black sea bass	Juveniles and adults	Continental shelf and estuarine waters from the southwestern Gulf of Maine and Cape Hatteras, North Carolina	Inshore in summer and spring	Benthic habitats with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas, also offshore clam beds and shell patches in winter
Clearnose skate	Juveniles	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-30	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom
Clearnose skate	Adults	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-40	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Haddock	Juveniles	Inshore and offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in the Mid-Atlantic region	40-140 and as shallow as 20 in coastal Gulf of Maine	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel
Haddock	Adults	Offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in Southern New England	50-160	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel and adjacent to boulders and cobbles along the margins of rocky reefs
Little skate	Juveniles	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-80	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
Little skate	Adults	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-100	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
Longfin inshore squid	Eggs	Inshore and offshore waters from Georges Bank southward to Cape Hatteras	Generally <50	Bottom habitats attached to variety of hard bottom types, macroalgae, sand, and mud

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Monkfish	Juveniles	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on a variety of habitats, including hard sand, pebbles, gravel, broken shells, and soft mud, also seek shelter among rocks with attached algae
Monkfish	Adults	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on hard sand, pebbles, gravel, broken shells, and soft mud, but seem to prefer soft sediments, and, like juveniles, utilize the edges of rocky areas for feeding
Ocean pout	Eggs	Georges Bank, Gulf of Maine, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	<100	Sub-tidal hard bottom habitats in sheltered nests, holes, or rocky crevices
Ocean pout	Juveniles	Gulf of Maine, on the continental shelf north of Cape May, New Jersey, on the southern portion of Georges Bank, and including certain bays and estuaries in the Gulf of Maine	Mean high water-120	Intertidal and sub-tidal benthic habitats on a wide variety of substrates, including shells, rocks, algae, soft sediments, sand, and gravel
Ocean pout	Adults	Gulf of Maine, Georges Bank, on the continental shelf north of Cape May, New Jersey, and including certain bays and estuaries in the Gulf of Maine	20-140	Sub-tidal benthic habitats on mud and sand, particularly in association with structure forming habitat types; i.e. shells, gravel, or boulders
Ocean quahogs	Juveniles and adults	Continental shelf from southern New England and Georges Bank to Virginia	9-244	In substrate to depth of 3 ft

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Pollock	Juveniles	Inshore and offshore waters in the Gulf of Maine (including bays and estuaries in the Gulf of Maine), the Great South Channel, Long Island Sound, and Narragansett Bay, Rhode Island	Mean high water-180 in Gulf of Maine, Long Island Sound, and Narragansett Bay; 40-180 on Georges Bank	Intertidal and sub-tidal pelagic and benthic rocky bottom habitats with attached macroalgae, small juveniles in eelgrass beds, older juveniles move into deeper water habitats also occupied by adults
Pollock	Adults	Offshore Gulf of Maine waters, Massachusetts Bay and Cape Cod Bay, on the southern edge of Georges Bank, and in Long Island Sound	80-300 in Gulf of Maine and on Georges Bank; <80 in Long Island Sound, Cape Cod Bay, and Narragansett Bay	Pelagic and benthic habitats on the tops and edges of offshore banks and shoals with mixed rocky substrates, often with attached macro algae
Red hake	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including Passamaquoddy Bay to Cape Cod Bay in the Gulf of Maine, Buzzards Bay and Narragansett Bay, Long Island Sound, Raritan Bay and the Hudson River, and lower Chesapeake Bay	Mean high water-80	Intertidal and sub-tidal soft bottom habitats, esp those that provide shelter, such as depressions in muddy substrates, eelgrass, macroalgae, shells, anemone and polychaete tubes, on artificial reefs, and in live bivalves (e.g., scallops)
Red hake	Adults	In the Gulf of Maine, the Great South Channel, and on the outer continental shelf and slope from Georges Bank to North Carolina, including inshore bays and estuaries as far south as Chesapeake Bay	50-750 on shelf and slope, as shallow as 20 inshore	Sub-tidal benthic habitats in shell beds, on soft sediments (usually in depressions), also found on gravel and hard bottom and artificial reefs
Rosette skate	Juveniles and adults	Outer continental shelf from approximately 40˚N to Cape Hatteras, North Carolina	80-400	Benthic habitats with mud and sand substrates

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Scup	Juveniles	Continental shelf between southwestern Gulf of Maine and Cape Hatteras, North Carolina and in nearshore and estuarine waters between Massachusetts and Virginia	No information	Benthic habitats, in association with inshore sand and mud substrates, mussel and eelgrass beds
Scup	Adults	Continental shelf and nearshore and estuarine waters between southwestern Gulf of Maine and Cape Hatteras, North Carolina	No information, generally overwinter offshore	Benthic habitats
Silver hake	Juveniles	Gulf of Maine, including certain bays and estuaries, and on the continental shelf as far south as Cape May, New Jersey	40-400 in Gulf of Maine, >10 in Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats in association with sand-waves, flat sand with amphipod tubes, shells, and in biogenic depressions
Silver hake	Adults	Gulf of Maine, including certain bays and estuaries, the southern portion of Georges Bank, and the outer continental shelf and some shallower coastal locations in the Mid-Atlantic	>35 in Gulf of Maine, 70-400 on Georges Bank and in the Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats, often in bottom depressions or in association with sand waves and shell fragments, also in mud habitats bordering deep boulder reefs, on over deep boulder reefs in the southwest Gulf of Maine
Summer flounder	Juveniles	Continental shelf and estuaries from Cape Cod, Massachusetts, to Cape Canaveral, Florida	To maximum 152	Benthic habitats, including inshore estuaries, salt marsh creeks, seagrass beds, mudflats, and open bay areas

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Summer flounder	Adults	Continental shelf from Cape Cod, Massachusetts, to Cape Canaveral, Florida, including shallow coastal and estuarine waters during warmer months	To maximum 152 in colder months	Benthic habitats
Spiny dogfish	Juveniles	Primarily the outer continental shelf and slope between Cape Hatteras and Georges Bank and in the Gulf of Maine	Deep water	Pelagic and epibenthic habitats
Spiny dogfish	Female sub-adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
Spiny dogfish	Male sub-adults	Primarily in the Gulf of Maine and on the outer continental shelf from Georges Bank to Cape Hatteras	Wide depth range	Pelagic and epibenthic habitats
Spiny dogfish	Female adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
Spiny dogfish	Male adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
Thorny skate	Juveniles	Offshore Gulf of Maine, some coastal bays in the Gulf of Maine, and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 om slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud
Thorny skate	Adults	Offshore Gulf of Maine and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 om slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
White hake	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including bays and estuaries in the Gulf of Maine	Mean high water - 300	Intertidal and sub-tidal estuarine and marine habitats on fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats
White hake	Adults	Gulf of Maine, including coastal bays and estuaries, and the outer continental shelf and slope	100-400 offshore Gulf of Maine, >25 inshore Gulf of Maine, to 900 on slope	Sub-tidal benthic habitats on fine-grained, muddy substrates and in mixed soft and rocky habitats
Windowpane flounder	Juveniles	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to northern Florida, including bays and estuaries from Maine to Maryland	Mean high water - 60	Intertidal and sub-tidal benthic habitats on mud and sand substrates
Windowpane flounder	Adults	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to Cape Hatteras, North Carolina, including bays and estuaries from Maine to Maryland	Mean high water - 70	Intertidal and sub-tidal benthic habitats on mud and sand substrates
Winter flounder	Eggs	Eastern Maine to Absecon Inlet, New Jersey (39° 22´N) and Georges Bank	0-5 south of Cape Cod, 0-70 Gulf of Maine and Georges Bank	Sub-tidal estuarine and coastal benthic habitats on mud, muddy sand, sand, gravel, submerged aquatic vegetation, and macroalgae

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Winter flounder	Juveniles	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 60	Intertidal and sub-tidal benthic habitats on a variety of bottom types, such as mud, sand, rocky substrates with attached macro algae, tidal wetlands, and eelgrass; young-of-the-year juveniles on muddy and sandy sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks
Winter flounder	Adults	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 70	Intertidal and sub-tidal benthic habitats on muddy and sandy substrates, and on hard bottom on offshore banks; for spawning adults, also see eggs
Winter skate	Juveniles	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries from eastern Maine to Chincoteague Bay, Virginia, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-90	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud

Species	Life Stage	Geographic Area	Depth (m)	Habitat Type and Description
Winter skate	Adults	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries in Maine and New Hampshire, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-80	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud
Witch flounder	Juveniles	Gulf of Maine and outer continental shelf and slope	50-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
Witch flounder	Adults	Gulf of Maine and outer continental shelf and slope	35-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
Yellowtail flounder	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	20-80	Sub-tidal benthic habitats on sand and muddy sand
Yellowtail flounder	Adults	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	25-90	Sub-tidal benthic habitats on sand and sand with mud, shell hash, gravel, and rocks

* Unless otherwise noted, common temperature and salinity ranges were derived primarily from inshore and offshore trawl survey data (mostly fall and spring). Temperature and salinity information is meant to supplement the EFH text descriptions; it is not prescriptive.

** See Appendix B in Northeast FMC (2016) for additional information on other preferred habitat features for Atlantic salmon

5.6 HUMAN COMMUNITIES

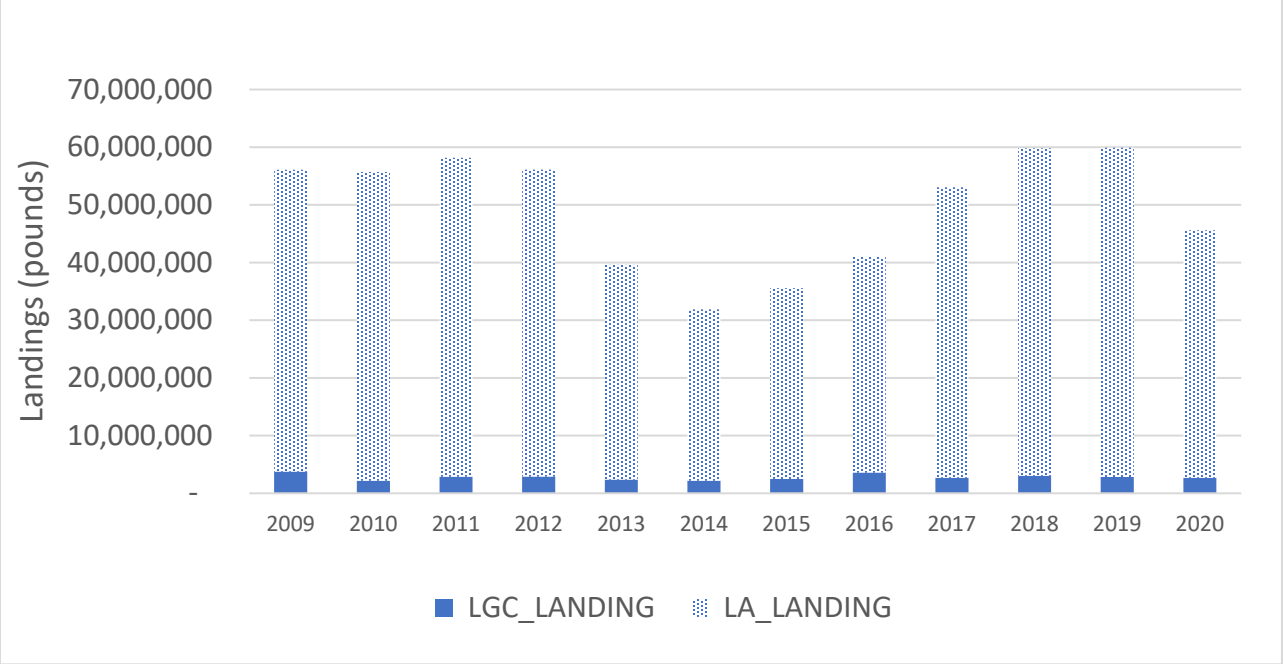
5.6.1 Economic Trends in the Sea Scallop Fishery

5.6.1.1 Trends in landings, prices and revenues

During the fishing years 2009-2020, scallop landings ranged from about 32 to 60 million pounds. In 2020, the total scallop landings from all permit categories increased to about 45.58 million pounds, i.e., about 24 percent decrease from 2019 landings. The majority of the scallop landings were attributed to limited access (LA) vessels. The landings may have also declined due to Covid-19 for the health safety concern of harvesting crews beside a lower projected landing in FW33. Landings from LA vessels significantly decreased by about 14 million pounds from roughly 57 million pounds of scallops in 2019 to about 43 million pounds in 2020 (Table 25 and Figure 5).

Landings by the LGC vessels declined after 2009 as a result of the implementation of Amendment 11, which transitioned the open access general category fishery to a limited access program and capped overall catch of this component at 5.5% of the fishery wide ACL. Landings by the LGC fishery (i.e., IFQ, NGOM and incidental permits) slightly decreased in 2020 to about 2.69 million from 2.83 million pounds in 2019 (Table 25 and Figure 5).

Figure 5. Scallop landings (in lbs.) by permit category (2009-2020).



Note: LGC only landing (IFQ or NGOM but excludes INCI); LA landing = (SC_% =T)

Scallop landings, revenue, and ex-vessel price per pound have fluctuated over the FY2009 to FY2020 time period. Landings and revenue are closely related in that increases in overall landings drives increases in overall revenue. Variability in ex-vessel price is correlated with landings volume – for example, upward trends in landings have led to downward trends in average ex-vessel price per pound (Table 25 and Figure 6). Interannual variability in landings, revenue, and average ex-vessel price per pound over the past ten fishing years is displayed in Table 25 and Figure 6. In more recent fishing years, average scallop price remained at about $13.11 per pound

during 2014-2016, but it fell to slightly above $10 per pound in 2017 due to an increase in scallop landings. The prices in 2018 and 2019 were $9.37 per pound and $9.17 per pound, respectively. Although price declined in 2019 relative to 2018 or prior years, scallop revenue increased to about $562 million in 2018. In 2019, revenue declined slightly to $553 million. In 2020, revenue further declined to $476.53 million even though price increased compared to 2019 (Table 25 and Figure 6).

Figure 6. Trends in total scallop revenue and ex-vessel price per pound (both in 2020 $) by fishing year (LA & LAGC fisheries)

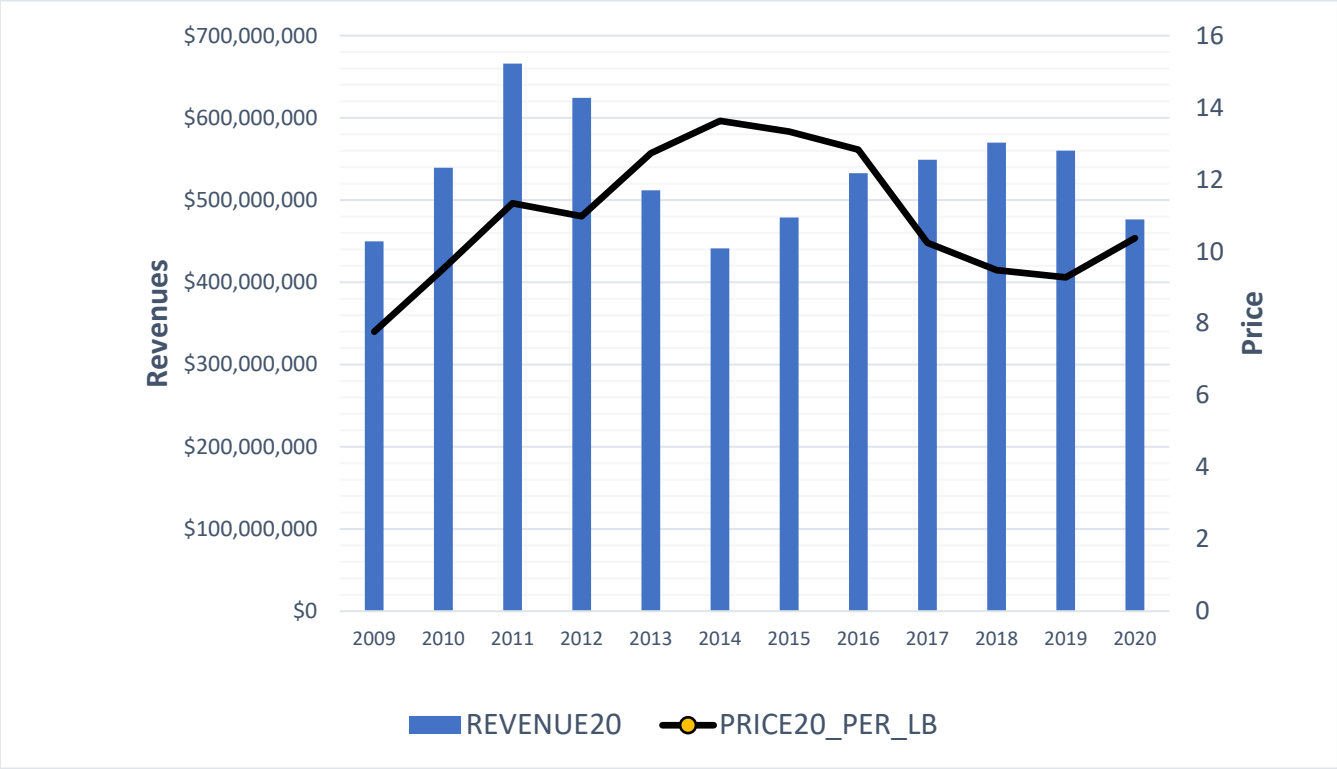


Table 25. Sea scallop landings (also by permit category), revenues, and average prices (2009-2020).

Fish Years	Landings (pounds)			Total Revenues		Price per pound
	LGC	LA	Total landings	Nominal $	Real (in 2020$)	Real (in 2020$)
2009	3,765,498	52,301,210	56,066,708	$372,538,290	$449,762,514	7.77
2010	2,176,421	53,502,413	55,678,834	$453,655,482	$539,295,628	9.52
2011	2,876,064	55,277,566	58,153,630	$578,711,169	$665,874,087	11.34
2012	2,897,587	53,222,797	56,120,384	$552,769,693	$624,245,842	10.98
2013	2,372,607	37,221,866	39,594,473	$459,432,949	$511,788,960	12.73
2014	2,177,549	29,713,331	31,890,880	$401,510,760	$441,220,615	13.63
2015	2,492,802	33,056,153	35,548,955	$437,143,932	$478,851,936	13.33
2016	3,611,174	37,358,052	40,969,226	$493,734,421	$532,672,802	12.83
2017	2,695,546	50,366,902	53,062,448	$519,841,358	$548,934,909	10.24
2018	3,035,292	56,764,997	59,800,289	$552,162,845	$569,827,497	9.48
2019	2,831,163	57,088,022	59,919,185	$553,506,651	$560,172,706	9.28
2020	2,689,903	42,895,178	45,585,081	$476,529,652	$476,529,652	10.37

Table 26. Average scallop landings and revenues (in 2020 dollars) per vessel for FT and FT SMD vessels.

Fish Year	Landings in lbs.		Average Landings per vessel (lbs.)		Average Revenue per vessel (in 2020 dollars)	
	FT	FT SMD	FT	FT SMD	FT	FT SMD
2009	41,411,655	7,298,416	169,027	137,706	$1,332,418	$1,020,553
2010	42,779,955	,792,986	169,762	130,634	$1,624,344	$1,212,761
2011	44,097,327	7,309,724	175,687	140,572	$1,990,154	$1,599,265
2012	42,749,294	7,063,239	169,640	135,832	$1,865,463	$1,457,273
2013	30,791,957	4,094,184	123,168	78,734	$1,571,780	$967,599
2014	24,836,675	3,179,401	98,951	61,142	$1,350,268	$812,765
2015	27,036,665	4,079,589	108,581	78,454	$1,450,891	$1,007,324
2016	29,781,474	4,821,326	119,126	92,718	$1,547,918	$1,090,553
2017	39,668,120	7,173,447	157,413	137,951	$1,602,788	$1,388,678
2018	45,463,988	7,861,387	183,323	145,581	$1,738,318	$1,370,959
2019	44,174,333	9,036,925	177,407	167,350	$1,640,733	$1,518,587
2020	34,571,652	5,849,129	138,287	106,348	$1,425,589	$1,057,201

The average annual scallop revenue per vessel for both full-time (FT) and full-time small dredge (FT-SMD) fluctuated with annual landings during 2009-2020. In 2020, average revenue per FT vessel substantially decreased from $1.62 million to $1.43 million in 2020. Similarly, average revenue for FT-SMD vessels also decreased from $1.52 million per vessel in 2019 to $1.06 million per vessel in 2020. (Table 26 and Figure 8). The average scallop revenue per FT vessel peaked at $1.99 million (in 2020 dollars) in 2011 as a result of higher landings combined with an increase in ex-vessel prices but declined to $1.35 million in 2014.

Figure 7. Trends on average scallop landings per full-time vessel by permit category.

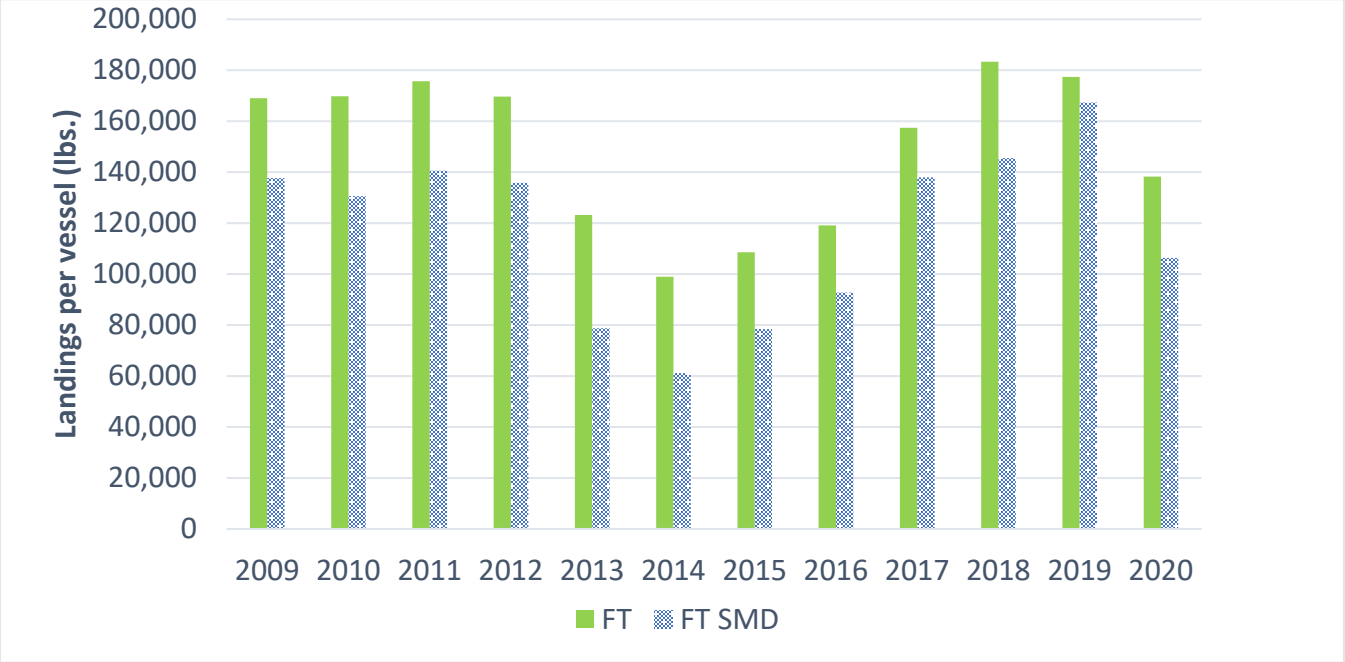
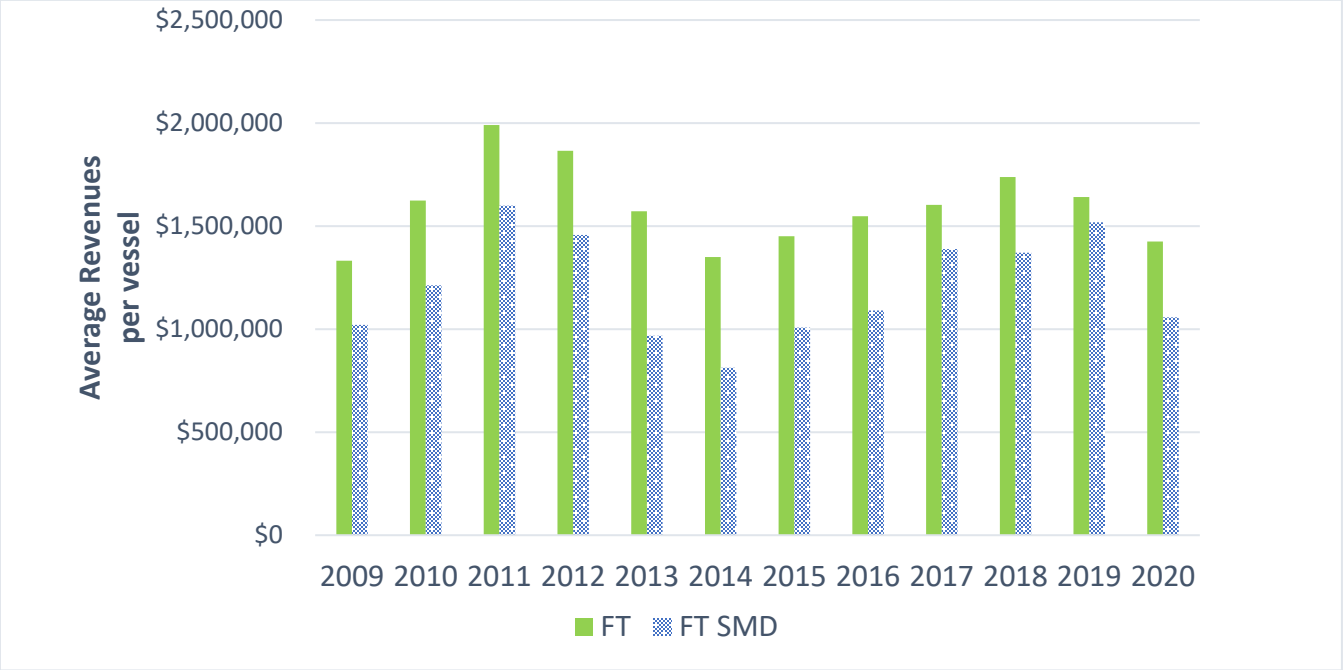
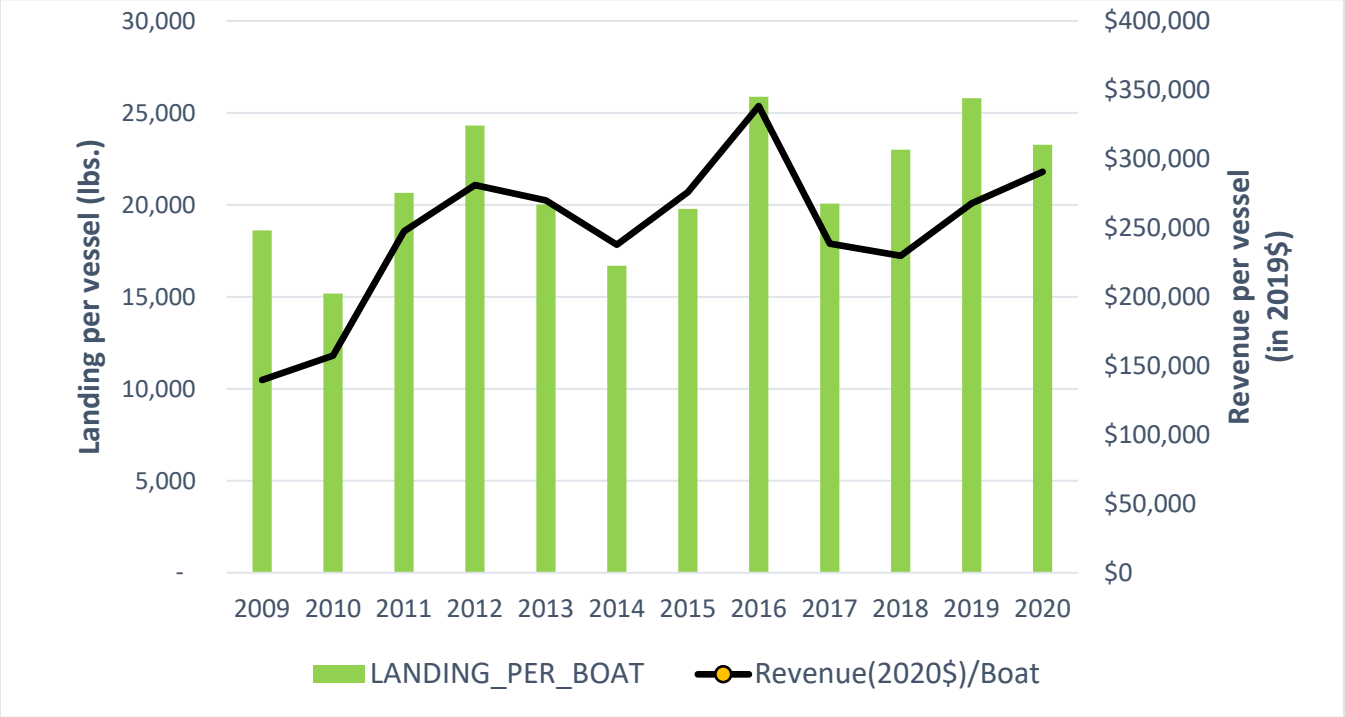


Figure 8. Trends in average scallop revenue per full-time vessel by permit category (in 2020 $).



The revenue per vessel by IFQs vessel has increased over time since 2011. The revenue per boat peaked to about $338,275 in 2016 but declined to around $229,828 in 2018 and increased to $264,532 in 2019 and $290,620 in 2020 (Figure 9). The increase in average revenue may be attributed to high prices for larger grades of scallops; however, scallop price is largely dependent on the landing volume of the LA component rather than the composition of landings by the LAGC component alone.

Figure 9. Average scallop landings and scallop revenue per vessel (in 2019 $) for LGC IFQ only boats.



5.6.1.1.1 Trends in landings by permit category for limited access vessels

Table 27 and Table 28 describe scallop landings by LA vessels by gear type and permit category. Most limited access category effort is from vessels using scallop dredges, including small dredges. There are 11 full-time limited access vessels authorized to use a trawl (FT-NET) (Table 40). Table 28 shows that the percentage of landings by FT trawl permits has remained around 3% of total limited access scallop landings in recent years.[4] About 81% 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 2020. Including the FT-NET vessels that use dredge gear, the percentage of scallop pounds landed by dredge gear amounted to about 97% of the total scallop landings during 2009-2020.

[4] 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 are allowed to use dredge gear even though they have a trawl permit. All of the part-time trawl and occasional trawl permits were converted to small dredge vessels.

Table 27. Scallop landings (lbs.) by limited access vessels by permit category.

Fish Year	'FT'	'FT-SMD'	'FT-NET'	'PT'	'PT-SMD'	Total (lbs.)
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	45,463,988	7,861,387	1,619,563	-	1,820,059	56,764,997
2019	44,174,333	9,036,925	1,954,719	-	1,922,045	57,088,022
2020	34,571,652	5,849,129	1,283,172		1,191,225	42,895,178

Table 28. Percentage of scallop landings (lbs.) by limited access vessels by permit category.

Fish Year	'FT'	'FT-SMD'	'FT-NET'	'PT'	'PT-SMD'
2009	79.18	13.95	3.53	0.43	2.9
2010	79.96	12.7	3.34	0.45	3.56
2011	79.77	13.22	3.5	0.38	3.12
2012	80.32	13.27	3.3	0.4	2.71
2013	82.73	11	3.3	0.42	2.56
2014	83.59	10.7	2.96	0.36	2.39
2015	81.79	12.34	2.82	0.43	2.62
2016	79.72	12.91	3.42	0.53	3.42
2017	78.76	14.24	3.45	0.43	3.11
2018	80.09	13.85	2.85	-	3.21
2019	77.38	15.83	3.42	-	3.37
2020	80.6	13.64	2.99	-	2.78

5.6.1.1.2 Trends in landings for the Limited Access General Category IFQ component

Beginning in 2010 fishing year, the LAGC IFQ component was allocated 5% of the estimated scallop catch resulting in a decline in landings by the general category vessels[5] compared to years prior. The Council's IFQ program report presented on June 2017 provides a detailed review of the trends of the IFQ fishery during 2010-2015.[6] Table 29 presents the number of LAGC IFQ-only permits (i.e., excluding LA vessels with IFQ

[5] The general category scallop fishery has always been a comparatively small but diverse part of the overall scallop fishery. Beside LAGC-IFQ permits, there is also a separate limited entry program for general category fishing in the Northern Gulf of Maine (NGOM). Furthermore, a separate limited entry incidental catch permit (INCI) was adopted that will permit vessels to land and sell up to 40 pounds of scallop meat per trip while engaged in other fisheries. During the transition period to the full implementation of Amendment 11, the general category vessels were allocated 10% of the scallop TAC.

[6] http://s3.amazonaws.com/nefmc.org/3.170615_Draft_LAGC_IFQ_ProgramReview_wAppendicies.pdf

permits) and their scallop landings during 2009-2020. Compared to 2019, the landings by LAGC IFQ vessels slightly decreased in 2020 from about 2.6 million pounds to 2.46 million pounds.

Table 29. Active LAGC IFQ vessels and landings (excluding LA vessels w/ IFQ permits), FY2009 to FY2020.

Fish Year	Permit (IFQ only)	IFQ only landings lbs.	Fish Year	Permit (IFQ only)	IFQ only landings lbs.
2009	202	3,759,904	**2015**	122	2,413,760
2010	143	2,170,666	**2016**	135	3,493,944
2011	139	2,870,826	**2017**	129	2,588,370
2012	118	2,869,312	**2018**	123	2,828,934
2013	115	2,302,402	**2019**	101	2,605,933
2014	126	2,103,751	**2020**	106	2,466,530

5.6.1.2 Trends in effort allocations and LPUE

With the implementation of Amendment 10, LA vessels were allocated days-at-sea (DAS) for open areas and area specific access area trips with no open area trade-offs. [7] Total day-at-sea usage for the limited access component averaged at about 25,000 days during 2009-2012, ranged from 16,000 to 19,000 days during 2013-2015, and has increased to around 23,400 days during the 2016-2018 time period (Figure 10).

[7] 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.

Table 30. DAS and access area allocations per full-time vessel.

Year	Action	DAS	AA trips	CA I	CA II	NLS	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 emergency	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 converted to CA1)	18,000
2013[1]	FW24	33	2	118 trips***	182 trips	116 trips	210 trips	Closed	Closed	13,000
2014[1]	FW25	31	2	Closed	197 trips	116 trips	Closed	Closed	313 trips****	12,000
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	30.41	4	Closed	1	1	1, plus another trip to ETA rotational area			18,000
2018	FW29	24	6	1	Closed	2 NLS-W, 1 NLS-S	2			18,000
2019	FR30	24	7	1	Closed	3 in NLS-W	3			18,000
2020	FW32	24	5	.5 FLEX	1	.5 NLS-North, 1 NLS-South	2			18,000
2021	FW33	24	4	856 GC trips, RSA	1.5	1.5 NLS-South	1			18,000

[1] Access area trips were allocated to FT LA vessels using a lottery. Numbers shown are total trips allocated per area (not per vessel).
* 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

Between 2009 and 2018, total DAS usage by all LA vessels has ranged from just over 27,000 DAS to just over 16,000 DAS in 2014 (Figure 10). LA DAS usage is driven by the number of open-area DAS allocated to the FT LA fleet, the number of access area trips allocated to FT LA vessels, and LPUE in access areas. While LPUE increased from FY2016 to FY 2018, increasing in access area allocations contributed to total days fished.

Figure 10. Total DAS-used (Date landed – Date sailed) and LPUE by all LA vessels.

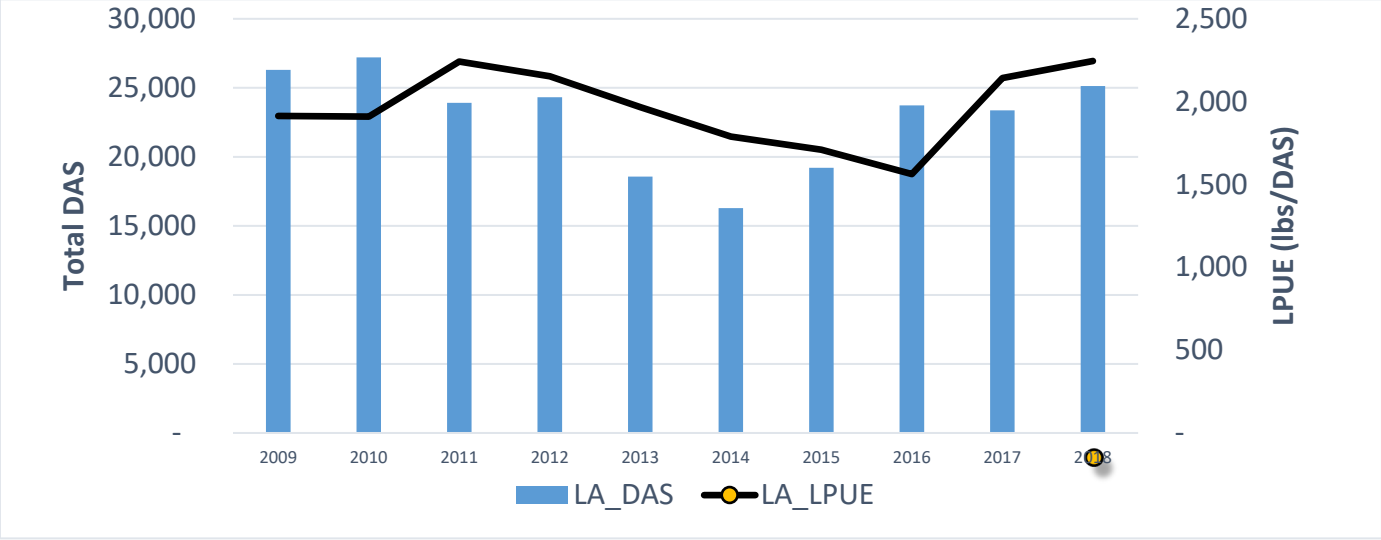
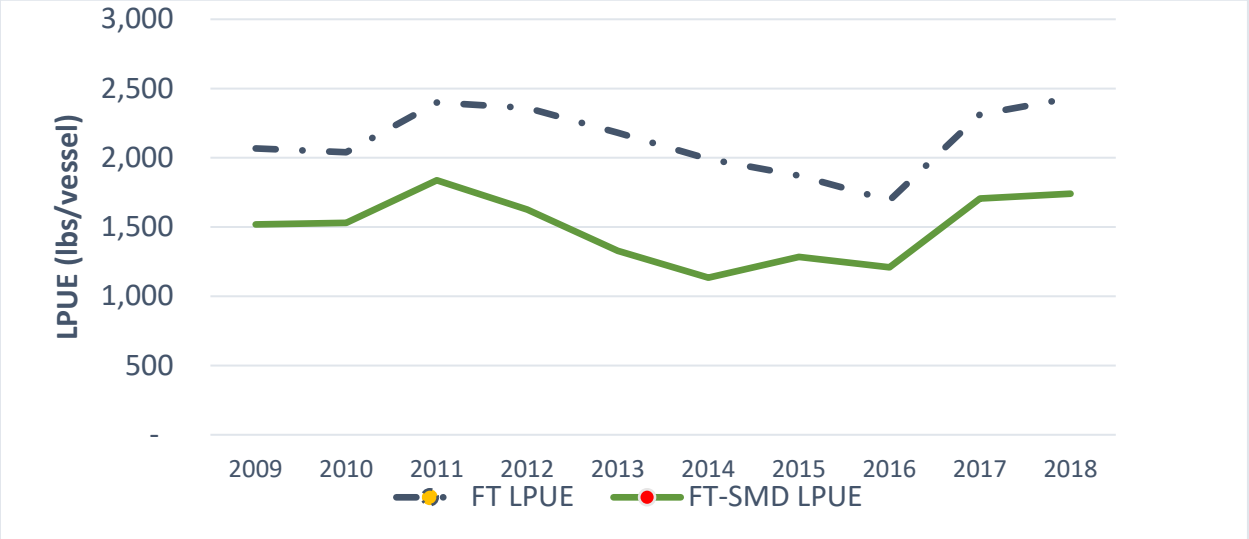


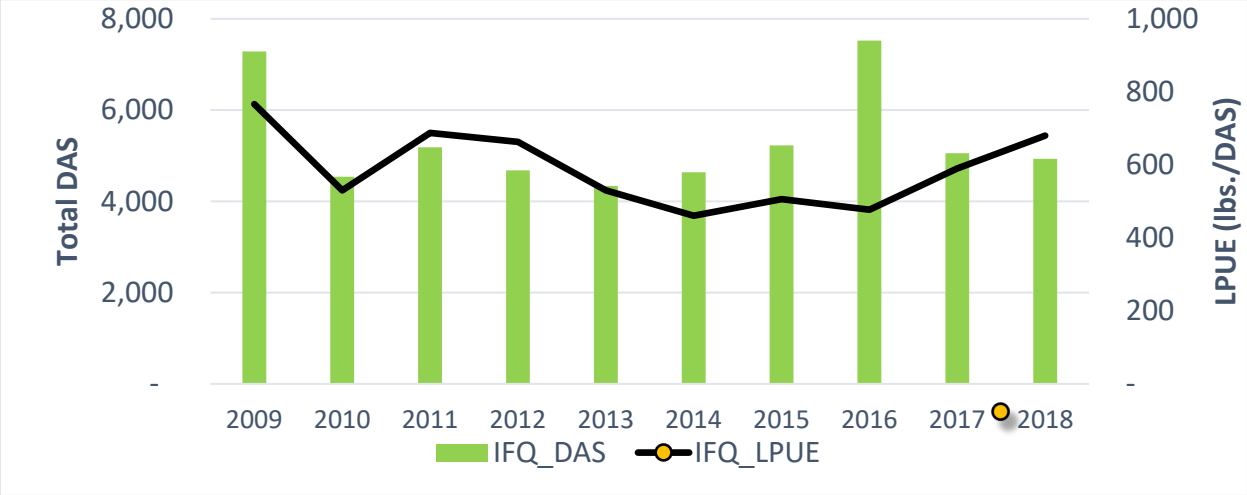
Figure 11 shows that LPUE for full-time dredge (FT) vessels has been consistently higher than LPUE for full time small dredge (FT-STD) vessels, and that LPUE for both categories has trended in a similar manner between 2009 and 2018. In the most recent complete fishing year (i.e., 2019), LPUE for FT and FT-SMD vessels was 2,431 pounds per day and 1,740 pounds per day, respectively. LPUE has continued to trend upward since the low points for FT vessels in 2016 and FT-SMD in 2014 (Figure 11).

Figure 11. LPUE for full-time vessels by permit category (includes steam time).



DAS for LAGC IFQ vessels declined substantially by about one third from its highest level at 7,524 in 2016 to 5,055 in 2017 and 4,933 in 2018. LPUE for LAGC IFQ vessels was lower during the 2013-2017 time period compared to the FY2009-2012 time period. LPUE for LAGC IFQ vessels increased from 478 pounds per day in 2016, to 590 pounds per day in 2017 to 680 pounds per day in 2018 (Figure 12).

Figure 12. LPUE and DAS-used for LAGC-IFQ vessels (includes steam time, excludes LA vessels).



5.6.1.3 Trends in the meat count and size composition of scallops

The share of market grades as a proportion of total scallop landings has fluctuated over time. Inter-annual variation is driven by the size/age of year classes in the fishery, as well as the timing of harvest (meat weight anomaly). Table 31 and Table 32 illustrate landings by market grades in pounds and as a percentage to total landings.

Table 31. Scallop landings by market category (lbs.).

Fish year	U10	11 to 20	21 to 30	31+	Unknown	Grand 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	10,856,965	41,365,184	6,930,184	65,768	880,567	60,098,667
2019	11,944,335	38,171,190	8,154,785	1,061,243	1,053,266	60,384,819
2020	7,680,431	26,585,538	7,013,746	3,967,575	714,734	45,962,024

Table 32. Size composition of scallops (in percent).

Fish Year	U10	11 to 20	21 to 30	31+	Unknown
2009	14.55%	61.81%	21.05%	0.30%	2.29%
2010	15.48%	63.63%	19.12%	0.11%	1.66%
2011	14.55%	77.10%	5.55%	0.52%	2.28%
2012	18.44%	73.14%	6.13%	0.11%	2.17%
2013	21.55%	61.62%	13.84%	0.31%	2.68%
2014	24.86%	58.96%	12.60%	0.88%	2.70%
2015	17.03%	58.85%	21.49%	0.47%	2.15%
2016	11.37%	45.21%	35.38%	5.30%	2.75%
2017	19.00%	54.84%	23.61%	0.73%	1.83%
2018	18.07%	68.83%	11.53%	0.11%	1.47%
2019	19.78%	63.21%	13.50%	1.76%	1.74%
2020	16.71%	57.84%	15.26%	8.63%	1.56%

Table 33. Composition of scallop revenue by size (percent of total scallop revenue).

Fish Year	U10	11 to 20	21 to 30	U31+	Unknown
2009	18.1%	59.37%	20.08%	0.27%	2.18%
2010	20.18	58.37	19.59	0.12	1.73
2011	14.93	76.48	5.85	0.52	2.22
2012	19.29	72.4	6.16	0.11	2.04
2013	23.17	60.43	13.85	0.32	2.25
2014	27.89	56.48	12.11	0.77	2.75
2015	21.04	56.67	19.95	0.45	1.94
2016	16.52	45.46	31.16	4.08	2.74
2017	25.18	50.2	21.88	0.77	2.07
2018	20.79	65.43	12.09	0.85	1.58
2019	22.37	61.36	12.69	3.62	2.04
2020	18.30	59.41	14.87	6.68	1.73

Larger scallops fetched higher prices than smaller scallops which led to an increase in overall average scallop prices since FY2010 (Table 34). Price per pound (in 2020 dollars) for U10 landings reached a high point in 2016 at $18.42, but declined to $13.97 in 2017 and further declined to around $11.76 in 2018 and 2019. An increase or decrease in prices of U10 scallops corresponds to annual landings for this market category. In FY202, U10 price increased to $12.81 per pound. In FY2020, the average price of 11-20 count scallops was around $12.69 per pound, and average price of 21-30 and 31-40 count scallops ranged between approximately $7 and $11 per pound.

Table 34. Price of scallop per pound by market category (in 2020 dollars).

Fish Years	Price U10	Price 11-20	Price 21-30	Price 31-40	Price 41+	Price Unknown
2009	$9.63	$7.48	$7.09	$7.49	$7.92	$10.43
2010	$12.60	$9.58	$9.89	$9.86	$9.66	$11.70
2011	$12.59	$11.53	$12.08	$11.85	$9.20	$15.27
2012	$12.28	$11.10	$11.33	$10.75	-	$17.82
2013	$14.75	$12.69	$12.81	$12.00	$9.46	$15.56
2014	$15.92	$13.53	$13.28	$11.86	$7.66	$15.55
2015	$16.63	$12.94	$12.72	$11.87	$7.77	$15.00
2016	$18.42	$13.01	$11.64	$10.00	$10.05	$13.81
2017	$13.97	$10.59	$10.05	$9.49	$9.56	$12.58
2018	$11.76	$9.50	$9.76	$9.37	$12.13	$11.23
2019	$11.77	$9.66	$9.09	$8.32	$8.11	$10.64
2020	$12.81	$12.69	$10.84	$7.32	$8.15	$12.69

5.6.1.4 Trends in permits by permit plan and category

Table 35 shows the number of active limited access vessels by permit category during 2009-2020 fishing years. The scallop fishery is primarily full-time permits, 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). Of these permits, the majority are dredge vessels, with a small number of full-time small dredge (FT-SMD) and full-time trawl (FT-NET) permit holders.[8] There were a total of 250 active full time limited access vessels in 2020. The number of LA vessels that also held an LAGC permit is shown in Table 36. The number of unique limited access permits from 2008 and 2009-2020 is shown in Table 37.

[8] The permit numbers shown in the Table 44 include duplicate entries because replacement vessels receive new permit numbers and when a vessel is sold, the new owner would get a new permit number.

Table 35. Number of limited access vessels by permit category and gear.

Permit Category		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
FT	Full Time	245	252	251	252	250	251	249	250	252	248	249	250
FT-NET	Full-time Trawl	11	11	11	11	11	11	11	11	11	10	11	11
FT-SMD	Full-time Small Dredge	53	52	52	52	52	52	52	52	52	54	54	55
Sub-total FT	**Full-time**	**309**	**314**	**315**	**314**	**313**	**314**	**312**	**312**	**311**	**313**	**308**	**316**
PT	Part-time	2	2	2	2	2	2	2	2	2	0	0	0
PT-SMD	Part-time Small Dredge	32	32	32	31	31	31	32	32	31	31	32	30
Sub-total PT	**Part-time**	**32**	**34**	**34**	**33**	**32**	**34**	**33**	**34**	**33**	**32**	**32**	**30**
Grand SUM		**343**	**349**	**348**	**348**	**346**	**347**	**346**	**347**	**348**	**343**	**346**	**346**

Table 36. LAGC permits held by limited access (LA) vessels by permit category.

Calendar Year	'LA vessels w/ IFQ permit'	'LA vessels w/ NGOM permit'	'LA vessels w/ INCI permit'
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
2019	40	27	109
2020	41	25	113

Table 37. Unique scallop permits and category for the 2020 application year.

Permit Category	2020	Permit Category	2020
Full-time	250	Part-time	2
Full-time small dredge	52	Part-time small dredge	32
Full-time net boat	11	Part-time trawl	0
Total full-time	**313**	**Total part-time**	**34**
Total Limited Access	**347**		

Table 38 shows that the number of LAGC permits, including LAGC permits held by LA vessels. The number of LAGC permits declined considerably after 2007 as a result of the Amendment 11 provisions. The numbers of LAGC permits by category, excluding the LAGC permits held by LA vessels, are shown in Table 39.

Table 38. LAGC permits (LAGC permits held by LA vessels are included).

	No. of permits qualified under A11 program)		
Calendar Year	**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
2019	150	72	133
2020	143	72	137

Table 39. Active LAGC permits after Amendment 11 implementation (excludes LAGC permits held by LA vessels).

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
2019	110	45	24
2020	102	47	24

The trends in the estimated number of active LA vessels are shown in Table 40 by permit plan. The number of full-time permits authorized to use trawls (FT-NET) has remained consistent over time, though the

majority of these vessels have elected to use dredge gear in recent years (Table 40).[9] Table 41 shows the number of active LAGC vessels by permit category excluding those LA vessels which have both LA and LAGC permits.

Table 40. Active vessels (i.e., vessels with scallop landings) during FY2009-2020.

Fish Year	'FT'	'PT'	'FT-SMD'	'PT-SMD'	'FT-NET'	Total
2009	245	2	53	32	11	343
2010	252	2	52	32	11	349
2011	251	2	52	32	11	348
2012	252	2	52	31	11	348
2013	250	2	52	31	11	346
2014	251	2	52	31	11	347
2015	249	2	52	32	11	346
2016	250	2	52	32	11	347
2017	252	2	52	31	11	348
2018	248	0	54	31	10	343
2019	249	0	54	32	11	346
2020	250	0	55	30	11	346

Table 41. Number of active vessels with LAGC permits by permit category (excludes LA vessels with LGC permits).

Fish Year	IFQ only	NGOM only	INCI only
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
2019	101	46	24
2020	106	48	25

5.6.1.5 Trends in limited access (LA only) and "IFQ only" permits by home port and primary port states.

Scallop permits are valuable economic assets because they allow permit holders to access a lucrative fishery. Thus, fishermen are incentivized to conserve the scallop resource and increase productivity to maximize economic benefits. The majority of LA vessels have home state and primary port states of landing in Massachusetts, followed by New Jersey, Virginia, and North Carolina (Table 42 and Table 43). The number of vessels by home port state and port of landing have remained about same across the 2009-2020 time period,

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

suggesting that permit transfers across states are minimal.[10] The number of LAGC IFQ permits are also summarized by both homeport state and primary port state as identified by the permit owner in Table 44 and Table 45.

Table 42. Number of limited access permits (LA only) by home state (Permit data).

HPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CT	10	10	10	10	9	9	9	10	10	9	8	4
FL	4	4	4	4	3	3	3	3	3	3	3	3
MA	145	147	148	149	149	150	145	145	145	147	143	144
ME	4	3	3	3	3	3	3	3	3	2	2	1
NC	41	40	39	38	40	39	41	41	38	38	42	44
NJ	84	90	92	91	92	94	91	92	96	94	98	99
NY	3	4	3	2	2	1	0	0	1	1	0	0
PA	5	5	4	3	3	3	3	3	3	3	3	3
RI	2	3	2	2	2	2	2	2	2	2	2	2
VA	43	45	45	46	42	44	52	46	45	44	45	46
Total	341	351	350	348	345	348	349	345	346	343	346	346

Table 43. Number of limited access permits (LA only) by primary port state (Permit data).

PPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CT	10	10	10	10	9	9	9	10	10	9	8	4
MA	146	148	149	150	150	153	148	148	147	149	146	148
ME	4	3	3	3	3	3	3	3	3	2	2	1
NC	26	25	24	23	25	25	29	29	27	26	30	31
NJ	88	93	94	94	94	95	93	95	100	98	102	104
NY	2	3	3	2	2	1	0	0	1	1	0	0
PA	1	1	1	1	1	1	1	1	0	0	0	0
RI	2	3	2	2	2	2	2	2	2	2	2	2
VA	62	64	64	63	59	60	64	58	56	56	56	56
Total	341	350	350	348	345	349	349	346	346	343	346	346

[10] The Council generally describes changes in the scallop fishery at the community level based on both port of landing, and home port state. A port of landing is the actual port where fish and shellfish have been landed. A home port 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 the majority of scallop catches for the year. Therefore, these results should take that into consideration.

Table 44. Number of LAGC-IFQ permits (IFQ only) by home state ports (exclude LA vessels with IFQ permits).

HPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CT	3	2	1	2	3	4	3	3	3	3	3	3
DE	1	2	2	2	2	2	2	2	3	0	1	1
FL	1	1	0	0	0	0	0	0	0	0	0	0
GA	1	1	0	0	0	0	0	0	0	0	0	0
MA	60	44	43	37	36	40	41	44	46	48	42	43
MD	8	5	4	3	2	2	2	4	3	3	2	3
ME	9	6	3	4	3	3	5	3	6	9	7	4
NC	30	22	16	9	10	9	10	12	8	8	6	5
NH	4	2	3	3	2	2	1	1	1	1	0	0
NJ	54	48	44	40	39	43	40	43	39	37	32	29
NY	17	15	15	13	12	13	12	12	11	11	10	10
PA	1	1	1	1	1	1	0	0	0	0	0	0
RI	5	5	6	6	6	4	4	4	4	4	4	4
TX	0	0	0	1	1	1	1	1	1	1	1	0
VA	5	4	3	3	2	3	2	4	3	3	2	1
Total	199	158	141	124	119	127	123	133	128	128	110	103

Table 45. Number of LAGC-IFQ permits (IFQ only) by primary port state (excludes LA vessels with IFQ permits).

PPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CT	3	2	1	2	3	4	3	4	4	4	4	4
DE	0	0	0	0	0	0	0	1	1	0	1	1
FL	2	2	0	0	0	0	0	0	0	0	0	0
GA	1	1	0	0	0	0	0	0	0	0	0	0
MA	60	45	44	38	37	41	42	45	47	49	42	43
MD	10	8	7	6	5	5	5	6	6	4	3	4
ME	8	5	3	4	3	3	5	3	6	9	7	4
NC	27	21	15	9	10	9	10	13	9	8	7	4
NH	4	1	2	2	1	1	0	0	0	0	0	0
NJ	55	48	45	41	40	44	40	43	39	35	30	30
NY	17	15	15	13	12	13	12	11	10	10	9	9
PA	0	0	0	0	0	0	0	0	0	2	2	2
RI	6	6	6	6	6	4	4	4	4	4	4	4
VA	5	4	3	3	2	3	2	3	2	3	1	0
Total	198	158	141	124	119	127	123	133	128	128	110	105

5.6.1.6 Foreign trade (import, export, and re-export) of scallops in FY2017-FY2019

Historically, China, Canada, and Japan have been the major exporters of various scallop products to the U.S. Recently, the U.S. imported a significant volume of scallops from Peru. In FY2020, the U.S. imported about

41.5 million lbs. or $220 million of scallop products primarily from Canada, Japan, Peru and, Argentina, and China. U.S. imports of scallop products in 2020 increased in both volume and value compared to 2019.

The top five destinations for U.S. scallop exports have been Canada, Netherlands, France, Belgium, and United Kingdom. In FY2020, the U.S. exported about 6.75 million pounds or $61 million worth of scallop products primarily to these countries. Scallop exports in 2020 declined significantly by about 47 percent relative to FY2019. The U.S. also re-exported some of its imports at a re-export value of about $21 million, primarily to France and Canada. The re-export value in FY2020 increased slightly relative to FY2019**.** Table 46 presents the volume and values (in nominal dollars) of U.S. imports, exports, and re-exports of scallops with major countries during FY2017-2020. It also provides average import and export prices for scallop products.

Table 46. Summary of U.S. scallop trades with top five trading partner countries during FY2017-2020.

FY 2017 U.S. Scallop Trades								
Import 2017			**Export 2017**			**Re-Export 2017**		
Countries	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**
China	17.86	$49.06	Canada	4.16	$39.82	France	1.53	$9.63
Canada	8.14	$78.69	Netherlands	2.73	$21.71	Canada	0.61	$4.10
Japan	4.46	$43.86	France	1.57	$14.46	China (HK)	0.08	$0.35
Mexico	4.17	$16.67	Belgium	1.02	$7.81	Netherlands	0.06	$0.51
Argentina	3.89	$19.71	U.K.	0.9	$7.32	U.K.	0.04	$0.42
Other	4.5	$21.65	Other	3.55	$28.41	Other	0.09	$0.66
SUM Imports	**43.02**	**$229.65**	**SUM Exports**	**13.95**	**$119.53**	**SUM Reexport**	**2.41**	**$15.65**
FY 2018 U.S. Scallop Trades								
Import 2018			**Export 2018**			**Re-Export 2018**		
Countries	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**
China	17.86	$49.06	Canada	4.16	$39.82	France	1.53	$9.63
Canada	8.14	$78.69	Netherlands	2.73	$21.71	Canada	0.61	$4.10
Japan	4.46	$43.86	France	1.57	$14.46	China (HK)	0.08	$0.35
Mexico	4.17	$16.67	Belgium	1.02	$7.81	Netherlands	0.06	$0.51
Argentina	3.89	$19.71	U.K.	0.9	$7.32	U.K.	0.04	$0.42
Other	4.5	$21.65	Other	3.55	$28.41	Other	0.09	$0.66
SUM Imports	**43.02**	**$229.65**	**SUM Exports**	**13.95**	**$119.53**	**SUM Reexp.**	**2.41**	**$15.65**
FY 2019 U.S. Scallop Trades								
Import 2019			**Export 2019**			**Re-Export 2019**		
Countries	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**
China	7.93	$17.91	Canada	4.03	$39.94	France	2	$12.62
Canada	7.82	$75.70	Netherlands	2.17	$16.19	Canada	0.7	$4.36
Argentina	3.69	$16.05	France	1.51	$14.14	Belgium	0.09	$0.60
Peru	5.43	$22.94	U.K.	0.89	$7.54	China (HK)	0.02	$0.10
Japan	6.39	$53.16	Belgium	0.82	$6.87			
France	1.15	$2.30	Australia	0.34	$2.83			
Other	4.59	$20.98	Other	2.86	$23.80	Other	0.09	$0.58
SUM Imports	**37**	**$209.04**	**SUM Exports**	**12.62**	**$111.31**	**SUM Reexp.**	**2.9**	**$18.26**
FY 2020 U.S. Scallop Trades								
Import 2020			**Export 2020**			**Re-Export 2020**		
Countries	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**
Canada	7,99	$81.76	Canada	3.48	$33.32	France	2.04	$11.68
Japan	5,51	$41.43	Netherlands	0.85	$6.20	Canada	1.20	$6.74
Peru	9.93	$36.32	France	0.42	$4.05	Netherlands	0.10	$0.93
Argentina	5.39	$19.28	Belgium	0.29	$2.25	Argentina	0.14	$0.77
China	8.34	$18.85	Uk	0.21	$2.11	Belgium	0.05	$0.28
Other	23.66	197.64	Other	5.25	$47.93	Other	3.53	$20.40
SUM Imports	**41.46**	**$220.01**	**SUM Exports**	**6.75**	**$61.32**	**SUM Reexport**	**3.55**	**$20.53**
Price (dollar/pound) in current dollar								
Import Price 2017		$6.27	Export Price 2017		$8.69	Re-Export Price 2017		$6.87
Import Price 2018		$5.34	Export Price 2018		$8.57	Re-Export Price 2018		$6.49
Import Price 2019		$5.65	Export Price 2019		$8.82	Re-Export Price 2019		$6.30
Import Price 2020		$5.31	Export Price 2020		$9.07	Re-Export Price 2020		$5.79

5.6.1.7 Trip and Fixed costs

Trip and fixed cost estimates for LA and LAGC IFQ vessels for FY2020 are provided in the Appendix for Economic Models.

5.6.2 Fishing Communities

Considering the socioeconomic impacts on fishing communities of proposed fishery regulations is required by NEPA (NEPA 1970) and the MSA, particularly National Standard 8 (MSA 2007) which defines a "fishing community" as "a community which is 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)). Here, "fishing communities" are those with substantial involvement in or dependence on the Atlantic sea scallop fishery.

5.6.2.1 Scallop Fishing Communities Identified

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.

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. These criteria are as adopted in Amendment 21 when the NOAA Fisheries Community Social Vulnerability Indicators were added (NEFMC 2021).

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 (Table 47):

- At least $5M average annual revenue of sea scallops, 2010-2017 (Table 48);
- 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.
- A ranking of high for engagement in or reliance on the scallop fishery on average in 2013-2017 according to the NOAA Fisheries Community Social Vulnerability Indicators (Table 49).

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, 2010-2017.
- A ranking of medium-high for engagement in or reliance on the scallop fishery on average in 2013-2017 according to the NOAA Fisheries Community Social Vulnerability Indicators.

Scallop Primary and Secondary Ports. Based on these criteria, there are 14 primary ports and 9 secondary ports in the sea scallop fishery (Table 47). 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 (58%), 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. 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. Ports are further described in Amendment 21. Community profiles are available from the NEFSC Social Sciences Branch website and in Clay et al (2007). 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.

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]		Engagement or Reliance Indicator		Primary/ Secondary
		>$500K	>$5M	≥50% scallops	LA	LAGC	Med-high	High	
ME	Cutler						√		Secondary
	Beals						√		Secondary
MA	Gloucester	√						√	Primary
	Sandwich	√							Secondary
	Provincetown	√				√	√		Primary
	Chatham	√						√	Primary
	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
NJ	Hobucken							√	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.

Table 48. Fishing revenue in top sea scallop ports, calendar years 2010-2017.

Port	Average revenue, 2010-2017		
	All fisheries	Sea scallops only	% sea scallops
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%
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= about 200)	**$1,046.3M**	**$460.4M**	**44%**

Note: Inflation adjusted to 2017 dollars. Shaded rows are primary ports.
Source: NMFS dealer data, accessed October 2018.

Table 49. Scallop fishing community engagement and reliance indicators, 2013-2017 average.

State	Community	Engagement	Reliance
ME	Cutler	Low	Medium-High
	Beals	Low	Medium-High
MA	Gloucester	High	Low
	Chatham	Medium-High	High
	Provincetown	Medium-High	Medium-High
	New Bedford	High	Medium-High
RI	Narragansett/Pt. Judith	High	Medium
NY	Montauk	Medium-High	Medium
NJ	Point Pleasant	High	Medium
	Barnegat Light/Long Beach	High	High
	Cape May	High	High
VA	Newport News	High	Low
NC	Hobucken	Low	High

Note: includes communities that have a ranking of at least medium-high for engagement or reliance.
Source: NOAA Fisheries Community Social Vulnerability Indicators.

5.6.2.2 Social and Gentrification Pressure Vulnerabilities

The NOAA Fisheries Community Social Indicators (see also Jepson & Colburn 2013) are quantitative measures that describe different facets of social and economic well-being that can shape either an individual's or community's ability to adapt to change. The indicators represent different facets of the concepts of social and gentrification pressure vulnerability to provide context for understanding the vulnerabilities of coastal communities engaged in and/or reliant on commercial fishing activities. Provided here are these indicators for the primary and secondary scallop ports (Table 50).

The Social Vulnerability Indicators. There are five social vulnerability indicators; the variables for which represent different factors that may contribute to a community's vulnerability. The **Labor force structure** index characterizes the strength/weakness and stability/instability of the labor force. The **Housing characteristics** index measures infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards. The **Personal disruption** index represents factors that disrupt a community member's ability to respond to change because of personal circumstances affecting family life such as unemployment or educational level. The **Poverty** index is a commonly used indicator of vulnerable populations. The **Population composition** index shows the presence of populations who are traditionally considered more vulnerable due to circumstances often associated with low incomes and fewer resources. A high rank in any of these indicates a more vulnerable population.

Almost half of the scallop port communities exhibit medium-high to high vulnerability in at least one of the five social vulnerability indicators. Across scallop ports, there is a contrast between ports that have low social vulnerability across indicators (11 ports score "low" in at least four indicators) and those that are high (4 ports are at least "medium-high in three or more indicators).

Gentrification Pressure Indicators. Gentrification pressure indicators characterize factors that, over time, may indicate a threat to the viability of a commercial or recreational working waterfront, including the displacement of fishing and fishing-related infrastructure. The **Housing Disruption** index represents factors that indicate a fluctuating housing market where some fishing infrastructure displacement may occur due to rising home values and rents. The **Retiree migration** index characterizes areas with a higher concentration of retirees and elderly people in the population. The **Urban sprawl** index describes areas with increasing population and higher costs of living. A high rank in any of these indicates a population more vulnerable to gentrification.

Almost all scallop ports scored medium-high to high in at least one of the three gentrification pressure indicators. This suggests that shoreside fishing infrastructure and fishing family homes may face rising property values (and taxes) from an influx of second homes and businesses catering to those new residents, which may displace the working waterfront. Across all scallop ports, the highest indicator of vulnerability is housing disruption.

Combined Social and Gentrification Pressure Vulnerabilities. Overall, 16 of the 23 port communities have medium to high levels of vulnerability for four or more of the eight indicators (combined social and gentrification pressure). This indicates high social and gentrification pressure vulnerability overall for both the primary and secondary communities. New Bedford, MA and Atlantic City and Wildwood, NJ have six indicators at the medium to high level.

Table 50. Social vulnerability and gentrification pressure in primary and secondary scallop ports, 2018.

State	Community	Social vulnerability					Gentrification pressure		
				Environmental Justice indicators					
		Labor Force Structure	Housing Characteristics	Personal Disruption	Poverty	Population Composition	Housing Disruption	Retiree Migration	Urban Sprawl
ME	Cutler (s)	Medium	Med-High	Low	Medium	Low	Med-High	Low	Low
	Beals (s)	Medium	n/a*	Low	Low	Low	Med-High	Low	Low
MA	Gloucester (p)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Sandwich (s)	Low	Low	Low	Low	Low	Med-High	Medium	Medium
	Provincetown (p)	Medium	Low	Low	Low	Low	High	Med-High	Med-High
	Chatham (p)	High	Low	Low	Low	Low	High	High	Medium
	Harwich/Harwichport/Barnstable (s)	Low	Low	Low	Low	Low	Med-High	Medium	Medium
	Fairhaven (p)	Low	Medium	Low	Low	Low	Medium	Medium	Medium
	New Bedford (p)	Low	Medium	Med-High	High	Med-High	Medium	Low	Med-High
RI	Narragansett/Pt. Judith (p)	Medium	Low	Low	Low	Low	Med-High	Medium	Low
CT	Stonington (p)	Low	Low	Low	Low	Low	Low	Medium	Low
	New London (s)	Low	Medium	High	High	Med-High	Low	Low	Low
NY	Montauk (p)	Medium	Low	Low	Low	Low	High	Med-High	Med-High
	Hampton Bays/Shinnecock (s)	Low	Low	Low	Low	Medium	High	Medium	Med-High
NJ	Pt. Pleasant/Pt. Pleasant Beach (p)	Medium	Low	Low	Low	Low	High	Medium	Med-High
	Barnegat Light/Long Beach (p)	High	Low	Low	Low	Low	High	High	Med-High
	Atlantic City (s)	Medium	Medium	High	High	High	High	Low	Low
	Wildwood (p)	Med-High	Medium	High	High	Low	High	Medium	Low
	Cape May (p)	Med-High	Low	Low	Low	Low	High	High	Medium
MD	Ocean City (s)	Medium	Med-High	Low	Low	Low	Med-High	Med-High	Low
VA	Hampton/Seaford (p)	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
	Newport News (p)	Low	Medium	Medium	Medium	Med-High	Low	Low	Low
NC	Hobucken (p)	Low	n/a	Medium	High	Low	n/a	Med-High	n/a

Source: NOAA Fisheries Community Social Indicators.

*n/a indicates ranking is not available due to incomplete data. (p) = scallop primary port. (s) = Scallop secondary port

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 5.0) and to each other.

6.1 INTRODUCTION

6.1.1 Evaluation Criteria

This action evaluates the potential impacts using the criteria in Table 51.

Table 51. General definitions for terms used to summarize impacts on VECs.

General Definitions				
VEC	**Resource Condition**	**Impact of Action**		
		Positive (+)	Negative (-)	No Impact (0)
Target and Non-target Species	Overfished status defined by the MSA	Alternatives that would maintain or are projected to result in a stock status above an overfished condition*	Alternatives that would maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed Protected Species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (e.g., no take)	Alternatives that result in interactions/take of listed resources, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA Protected Species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that will maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammal species that could result in takes above PBR	Alternatives that do not impact MMPA Protected Species
Physical Environment / Habitat / EFH	Many habitats degraded from historical effort (see condition of the resources table for details)	Alternatives that improve the quality or quantity of habitat	Alternatives that degrade the quality, quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human Communities (Social and economic impacts)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
	Impact Qualifiers			
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible	To such a small degree to be indistinguishable from no impact		
	Slight (sl), as in slight positive or slight negative)	To a lesser degree / minor		
	Moderately (M) positive or negative	To an average degree (i.e., more than "slight", but not "high")		
	High (H), as in high positive or high negative	To a substantial degree (not significant unless stated)		
	Significant (in the case of an EIS)	Affecting the resource condition to a great degree, see 40 CFR 1508.27.		
	Likely	Some degree of uncertainty associated with the impact		

*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact 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 2020. After a period of very high fishing mortality during the mid-1980's and early-1990's, management measures reduced fishing mortality and the stock responded positively. The overall impact of

management on this resource has been positive from a biological perspective. 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.

While the stock is considered healthy, recent surveys have not detected strong or exceptional recruitment events on a large scale since 2013. As two exceptional year classes are fished down, overall biomass and exploitable biomass estimates have declined from record highs. This has led to a decline in the legal limits and allocations (APL) for the fishery over the past two years, and this decline will likely continue into the near future (2023).

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 52 - Comparison of the No Action OFL/ABC from FW33 with updated OFL and ABC estimates for 2022 and 2023 (Alternative 2).

	FY	OFL	ABC including discards	Discards	ABC with discards removed
Alt. 1 – No Action	2022	41,926	32,872	4,798	28,074
Alt. 2 – Updated OFL and ABC	2022	38,271	30,305	4,581	25,724
	2023	34,941	27,606	4,406	23,200

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 2022, which were adopted by the Council through FW33 (Table 52). The No Action ABC including discards is 32,872 mt, or about 72 million pounds. The OFL values for No Action and Alternative 2 are similar (3,655 mt difference). The proposed ABC for FY2022 included discards is 25,724 mt, or about 56.7 million pounds. This is a roughly 22 million pound decrease in the ABC from the 2021 value, and a roughly 5 million pound decrease from 2022 default values under No Action.

As in past years, both alternatives (Alternative 1 and Alternative 2) could be expected to result in a healthy scallop biomass in the short and long term, and should be considered to have a slight positive impact. The best available data should be used to set ABC, which would include updated survey and fishery data from 2021 that is used in Alternative 2 compared to older data used in the No Action ABC (Alternative 1).

6.2.1.2 Alternative 2 – Updated OFL and ABC for FY 2022 and FY 2023

The FY 2022 and FY 2023 OFL and ABC values that were recommended by the SSC are summarized in Table 52. This year, the SSC recommended including scallop biomass from several areas of the Gulf of Maine as part of the OFL and ABC.

While the FY 2022 OFL is slightly higher than No Action, the 2023 default OFL would decline, reflecting anticipated mortality (both F and M) in the Nantucket Lightship South Deep and a lack of strong incoming recruitment. The 2022 ABC is 28% lower than the ABC for 2021 that was approved in Framework 33. After several years of below-average recruitment, the fishery will continue to target the small slow growing scallops in the Nantucket Lightship South which were part of the exceptional 2012 year class on Georges Bank. The 2013 year class that supported several years of high landings from the Mid-Atlantic Access Area has been reduced to low levels, despite forecasts that this are may still be viable for access area fishing in 2022. There are several cohorts on eastern Georges Bank, including pre-recruits, recruits, and adult scallops. In 2022, this region is projected to hold the largest share of exploitable biomass across the scallop resource.

Overall, the OFL and ABC values in Alternative 2 are based on the most updated survey information and model configurations; therefore, there should be slightly 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. As compared to Alternative 1, using the best available science to set the specification should have low-positive impacts.

6.2.2 Action 2 – Northern Gulf of Maine Management and TAL Setting

6.2.2.1 Alternative 1 – No Action

Under No Action, Stellwagen Bank would remain closed, and the default TAC from Framework 33 would be implements (74,000 pounds). In this scenario, the TAC for the LAGC directed fishery would be set at 72,000 pounds, with 2,000 pounds available for RSA compensation fishing.

While the No Action TAC would be less than any of the TAL options developed under Alternative 2, the default measures could be expected to have slight negative impacts on the resource in the NGOM because Stellwagen Bank would remain closed and fishing would continue in areas with low biomass and minimal recruitment. No Action would not implement any of the changes to the Northern Gulf of Maine management made by the Council in Amendment 21. Compared to the three TAL options in Alternative 2, No Action would have a slightly negative impacts on the scallop resource in the area since the TAC would be based on 2020 survey data and Stellwagen Bank would be closed.

6.2.2.2 Alternative 2 - Re-open Stellwagen Bank and set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery

Alternative 2 is expected to have positive impacts on the scallop resource in the NGOM management area, and compared to the No Action alternative. Stellwagen Bank would re-open after a two-year closure, and catch rates from the area are projected to be high. Alternative 2 implements a overall TAL for the management unit that serves as the limit for scallop removals from the management area. Distributing part of the TAL to the observer set-aside will support data collection from observed trips in the Northern Gulf of Maine. This information could be used directly in modeling scallop populations in the Gulf of Maine and Northern Gulf of Maine management unit. This data could also be used to set allocations at a level where harvest is projected to result in stock status is above an overfished condition.

6.2.2.3 2022 NGOM TAL Options

Options 1 – 3 in Framework 34 consider setting the NGOM TAL using a F rates of 0.15, 0.18, and 0.20, based on 2021 survey data from optical and dredge surveys. Option 1 would apply the lowest F rate, and could be expected to have the slight positive impacts relative to Options 2 and 3. While Option 2 would apply a relatively

conservative F rate of F=0.20 for setting the TAL, compared to Options 1 and 2, it could be expected to have slight negative impacts on the resource in the area. There are several factors that inform these conclusions. First, growth assumptions for the Stellwagen Bank area of the NGOM are uncertain, and could be overestimated. The area where most of the fishing is expected to occur has been closed for two years and holds high densities of scallops. Recent experience has shown higher levels of mortality in these situations, such as in the NLS-West. Scallops in the Stellwagen Bank area are relatively young, and still have growth potential. Stellwagen Bank is the most productive area in the NGOM, and there are no other strong year classes in the management unit.

6.2.3 Summary of 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 2023 are expected to be revisited again through a future action.

6.2.3.1 Overall Fishing Mortality and Outlook

- All the alternatives under consideration have a total estimate of short-term fishing mortality that is lower than the upper limit used for setting fishery allocations for the fishery overall. The ACT, or annual catch target, includes an overall fishing mortality limit of 0.39 for the total fishery. The range of total fishing mortality under consideration is between 0.07 Alternative 1 (No Action) and a high of 0.27 for Alternative 4 (Status Quo). The overall F rates for options in Alternatives 2 and 3 range from 0.23 at 20 DAS to 0.25 (26 DS with Hudson Canyon Open). While overall fishing mortality remains lower than legal limits, there are important trade-offs in the ST about where F may occur spatially in open bottom fishing.
- The total fishing mortality is constrained by the fishing target principle that does not enable average fishing mortality to increase above FMSY in open areas (0.61). 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 34 that would met open area F at the upper bound of F=0.61. Alternatives in Section 4.3 consider open area F rates under two separate open bottom configurations and include DAS options of 20 DAS and 26 DAS. This analysis also presents options for 22 DAS and 24 DAS to illustrate likely impacts between the range of options developed in Section 4.3.
- When compared to estimates of the overall F from the preferred alternatives in recent actions (FW25 – 33), the estimates of overall (total) F rates for all alternatives under consideration are higher than estimated F rates in recent years. The forecasted overall F rate has been increasing for the last three years (2020 – 2022). This increase was expected as the exceptional 2012 and 2013 year classes have moved through the fishery with no strong year classes following in recent years. This increase in total F is also a result of the partial approval of OHA2, which opened areas with high scallop biomass to fishing. Prior to OHA2, those scallops were surveyed and included in the calculation of overall F.
- The short term and long-term forecasts shown in Figure 14 illustrate some of the near-term trade-offs in terms of overall F between the options. The model is also suggesting that the range of alternatives developed for FY2022 would result in similar outcomes of F over the ST and LT under similar assumptions of fishing behavior over that time.
- Figure 15 illustrates the range of F rates predicted for each area in the SAMS model. The No Action and Status Quo runs which allocated a trip to the MAAA would result in fishing in that area of over 1.2 to achieve a half trip. The range of the inner quartiles is largest for 4.3.2.2, with Hudson Canyon Closed and 26 DAS. Opening the Hudson Canyon to open bottom results in lower predicted F rates in open areas of Georges Bank, which contracts the range of the inner quartiles for Alternative 3 at 20 and 26 DAS.

The risk of overfishing is low for all of the alternatives under consideration since the projected F rates are well below 0.61. However, the projection model tends to underestimate fishing mortality and recent forecasts have been overly optimistic. 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 13 - Comparison of total fishing mortality (F) estimates in FW34 Alternatives with the preferred alternatives from recent Frameworks, with sensitivity runs.

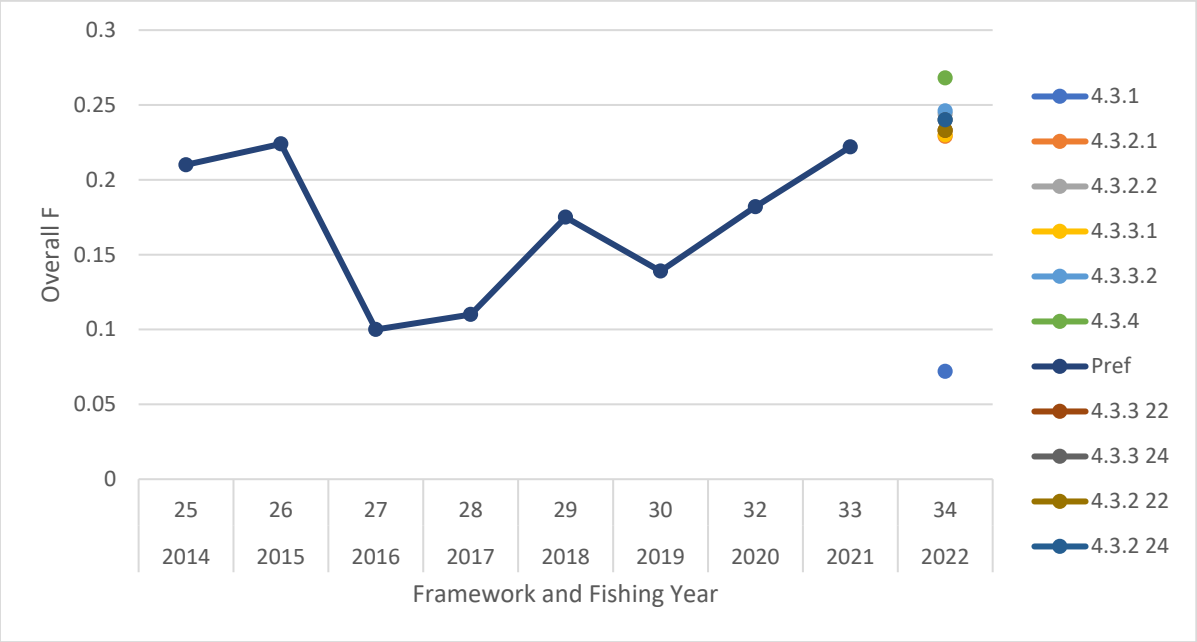


Figure 14 - Comparison of overall F over the ST and LT.

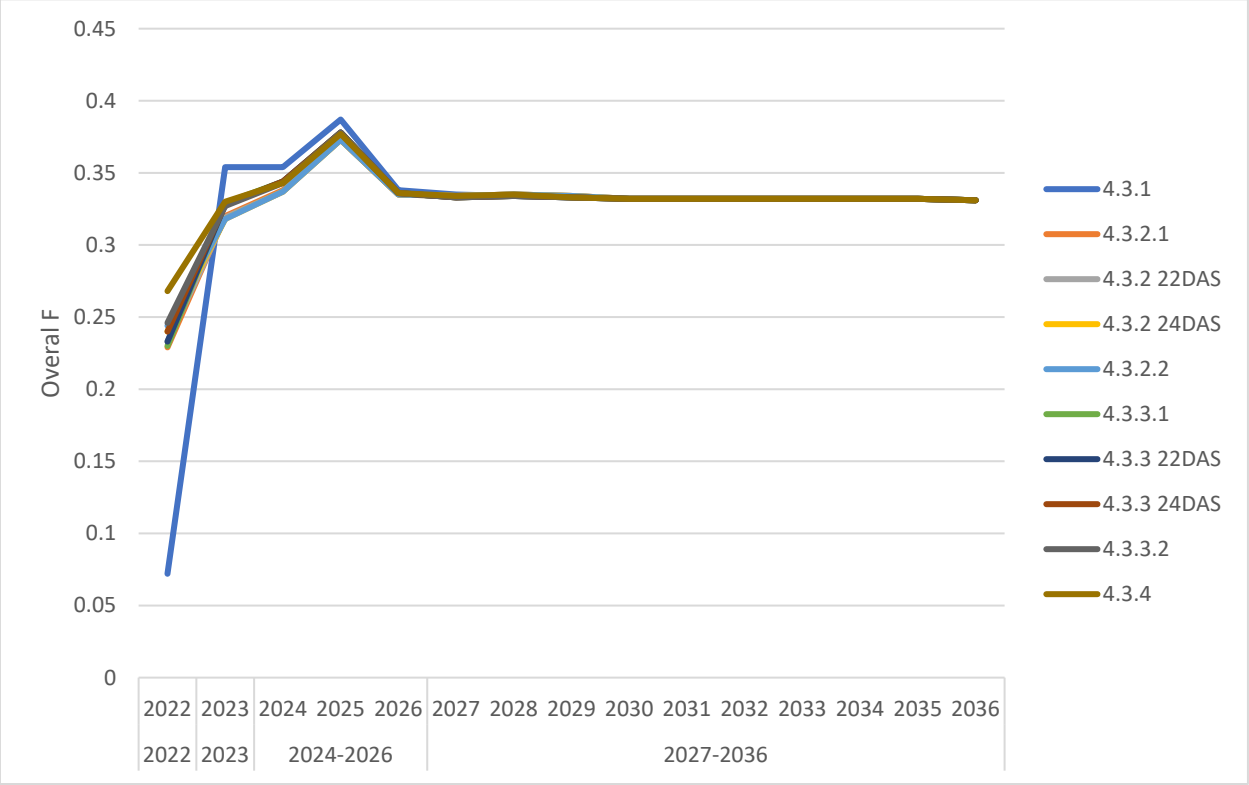
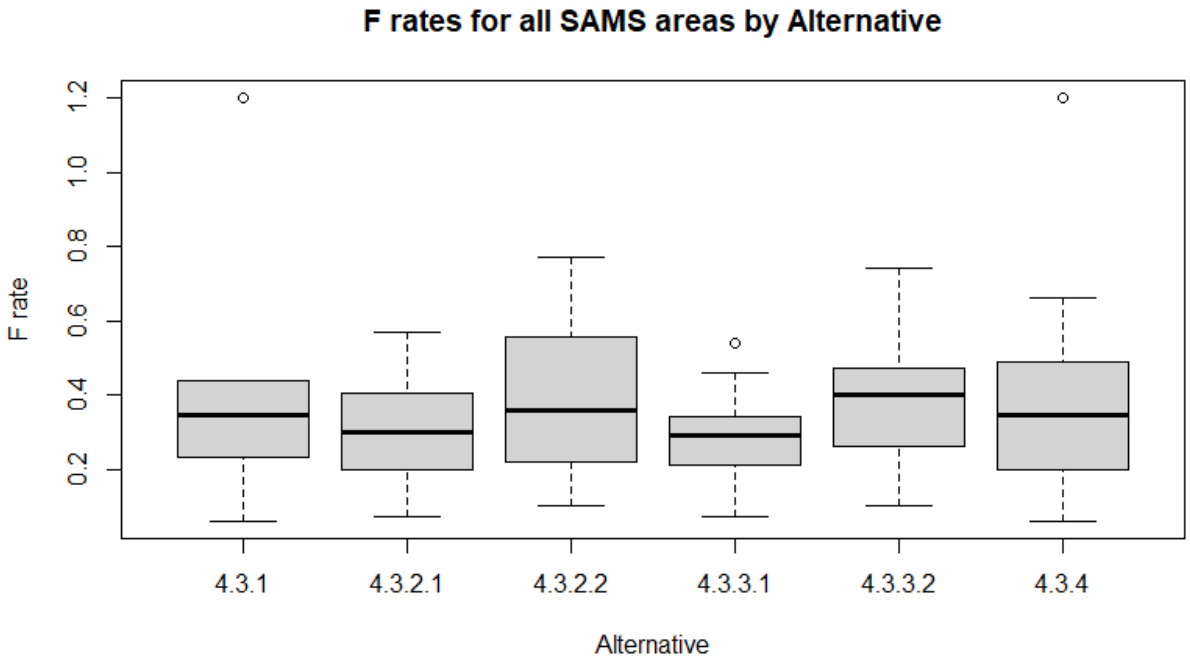


Figure 15 - Comparison of forecast F rates for all SAMS areas for alternatives in Action 3.



6.2.3.2 Open Area Fishing Mortality and Outlook

- Figure 16 provides a comparison of recent preferred F rates with options under consideration in FW34, including sensitivities of 22 DAS and 24 DAS with the Hudson Canyon open and closed. Open area F rates are predicted to increase from the FW33 preferred option under all options in Alternatives 2 and 3. The declining trend in open area F between 2016 and 2019 came as most more fishing was directed to rotational areas. While most options for FY2022 are below the F=0.48 that the Council recommended in 2015 and 2016, a key difference is that there has not been strong recruitment detected in any part of the fishery since then.
- The 2022 scallop surveys indicated that the majority of biomass in areas open for DAS fishing is on Georges Bank. Differences in biomass between the Mid-Atlantic and Georges Bank suggest that most of the open area fishing will occur on Georges Bank.
- Open area F rates are an average of area-specific F rates, and the model is forecasting above average F rates on Georges Bank, and below average F rates in the Mid-Atlantic (Figure 17). At 26 DAS allocated, the model predicts F rates to be above 0.6 in Georges Bank areas, while 20 DAS is forecast to result in F rates of 0.43 – 0.54 with Hudson Canyon open (Figure 17).

Figure 16 - Comparison of average open area fishing mortality (F) estimates in FW34 Alternatives with the preferred alternatives from recent Frameworks, with sensitivity runs

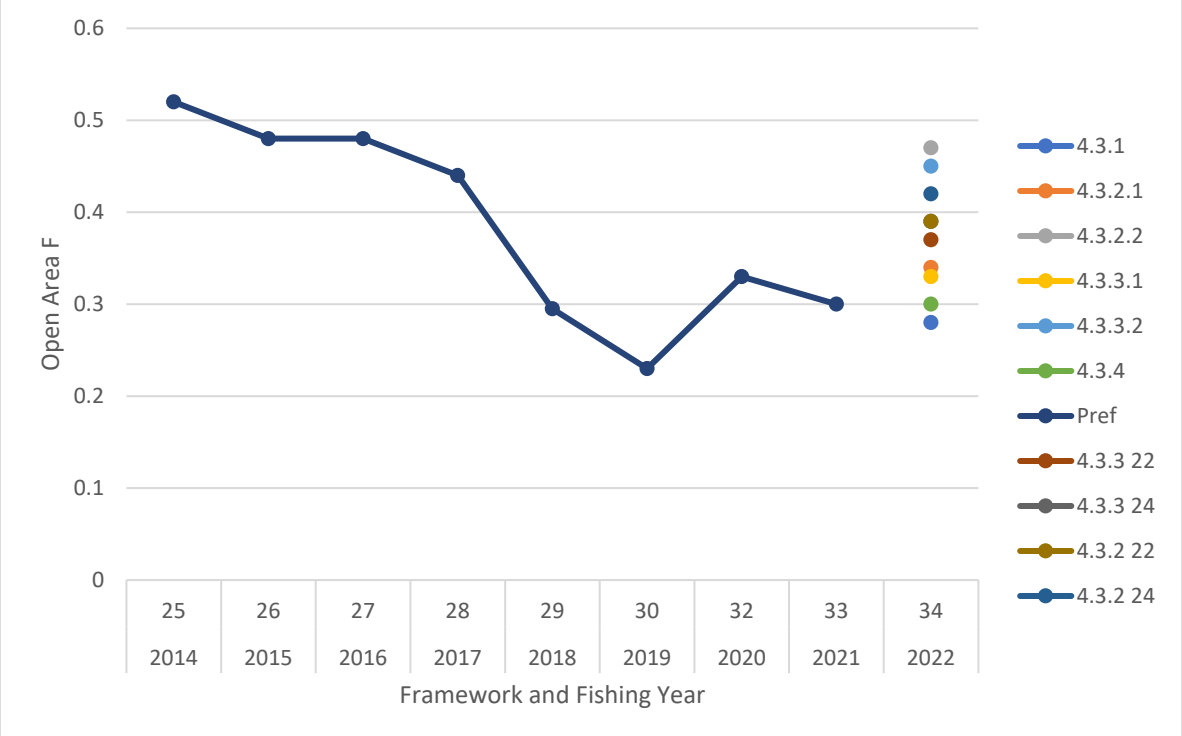
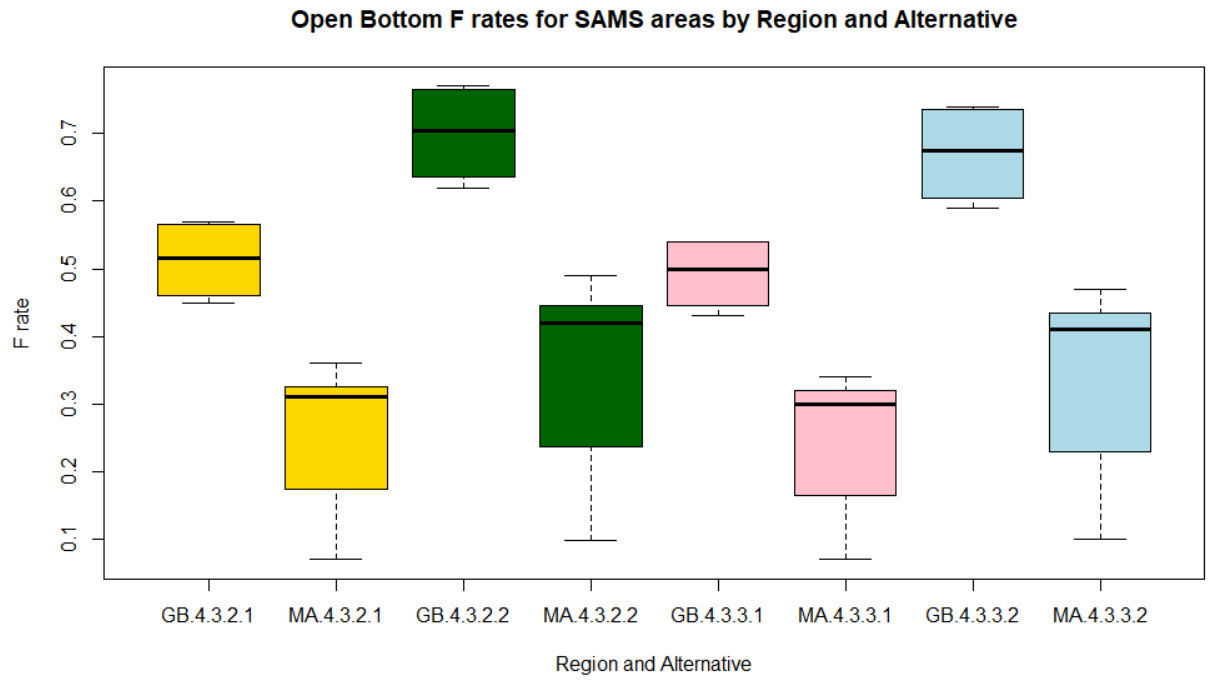


Figure 17 - Predicted open area F rates for Alternatives 2 & 3 grouped by Georges Bank and Mid-Atlantic SAMS areas.



6.2.3.3 Projected Landings

Overall, the projected landings for the alternative runs under consideration are very similar – with the exception of No Action (Figure 18). All options Framework 34 decrease overall landings compared to recent years. Alternative 2 and Alternative 3 both allocatee 3 access area trips for FY2022, meaning that differences in projected landings are driven by DAS allocations. Total projected landings are likely to be between 58% (20 DAS) and 66% (26 DAS) of the ACL, and well below the OFL. It is important to keep in mind that these are mean values and based on various assumptions for natural mortality and future recruitment.. The Council plans to revisit scallop fishery specifications again in 2022 to make recommendations for 2023. The uncertainty in projected landings is lower for year 1 but increases for 2023 and beyond. However, projections have been overly optimistic for parts of the resource in recent years (Figure 19).

Figure 18 - Comparison of Projected Landings for FW34 with preferred alternatives from recent actions (2014 - 2021).

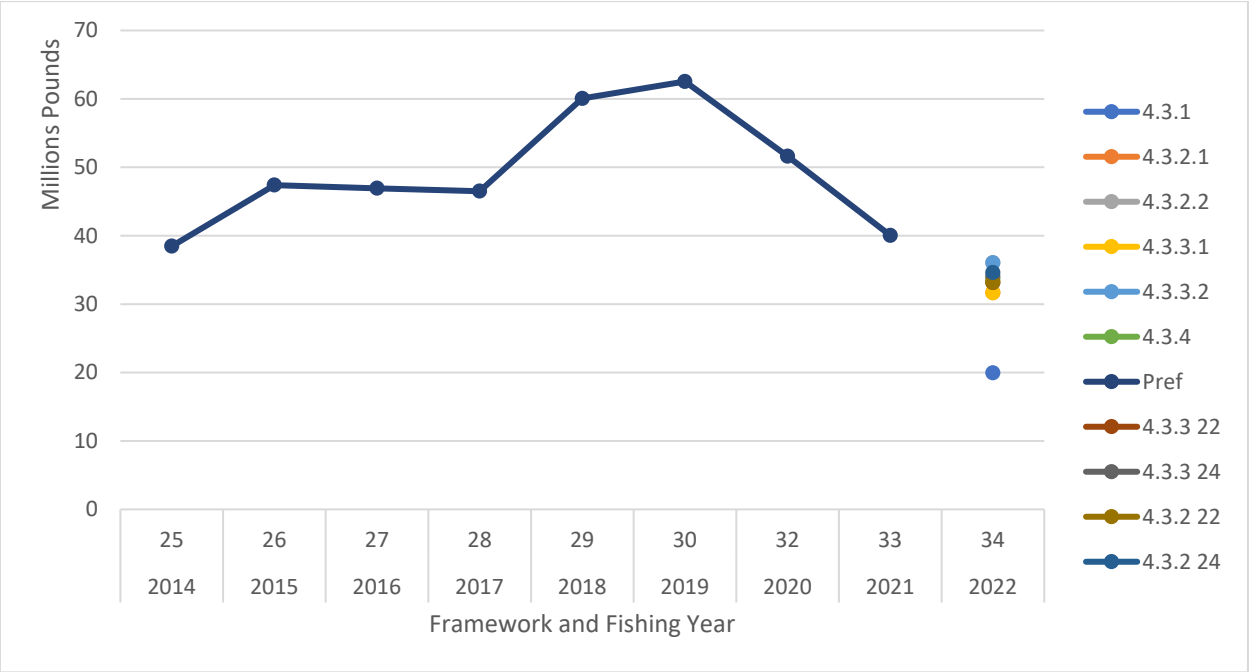
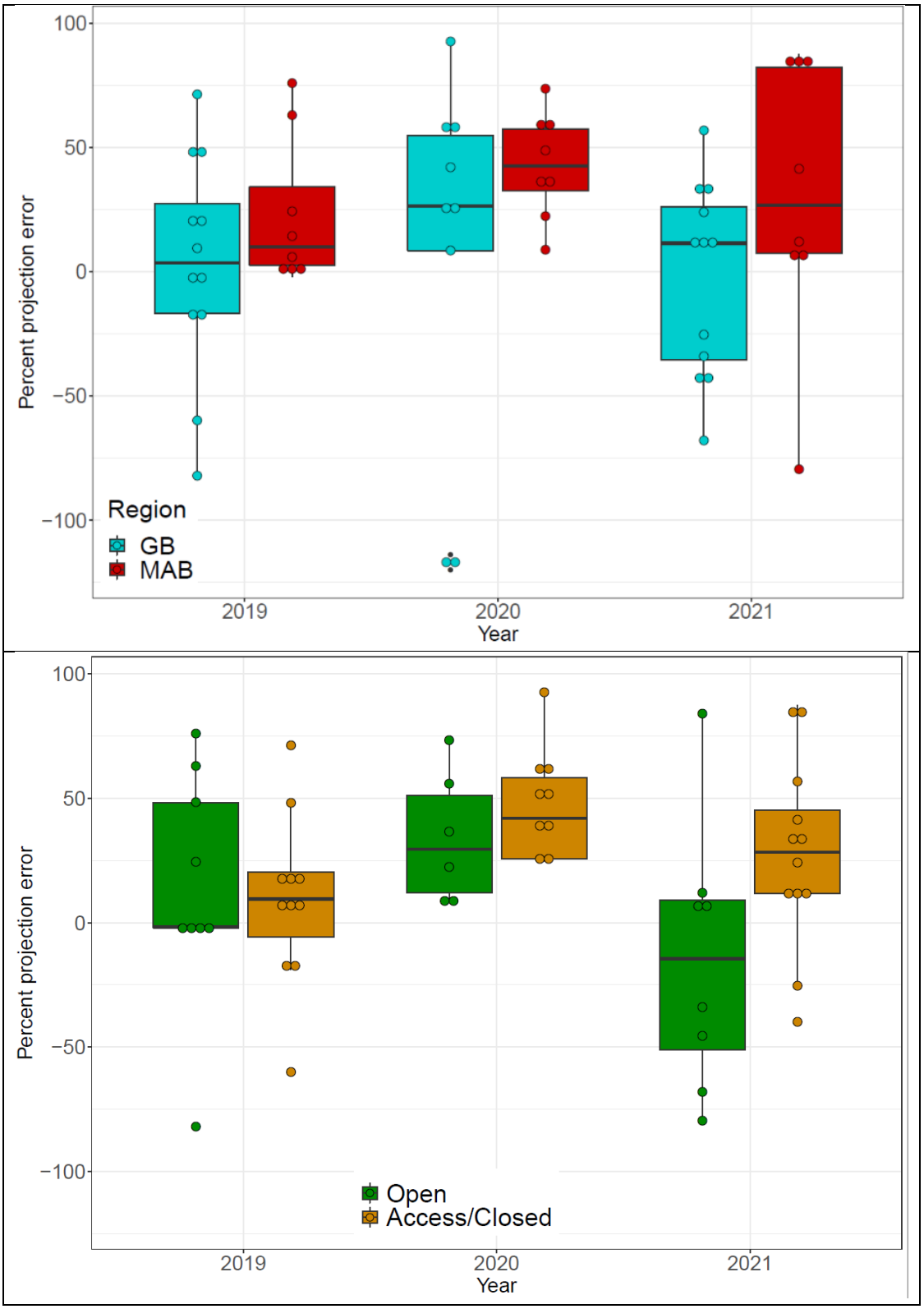


Figure 19 - Comparison of projection error for 2019 - 2021 by region (top) and access and open areas (bottom). The percent error is calculated as 100*(predicted-observed)/predicted



6.2.4 Action 3 – Fishery Specifications and Rotational Management

The alternatives developed in this action set FY 2022 open area and access trip allocations for the LA and LAGC IFQ components of the fishery. Default specifications for FY 2023 are also established. The Council considered a total of five options. In addition to Alternative 1/No Action, two rotational management approaches (Alternatives 2-3) were developed, each with two options for open area F values that would result in either 20 or 26 DAS for full time limited access vessels. Additional sensitivity analyses were considered for 22 and 24 DAS for each alternative.

Scallops in the NLS-South are from the exceptional 2012 year class that settled on Georges Bank. The animals in the NLS-South will be 11 years old in FY2022, though they have not grown normally and their average size in 2021 was roughly 91mm. The shell height to meat weight ratio of these scallops is also below average, and fishing in this area typically produces smaller meats compared to the MAAA and CAII. These scallops are not expected to resume normal growth and are likely experiencing elevated levels of natural mortality.

The majority of scallops in the Closed Area II region is concentrated in the CAII-SW and CAII-EXT areas, where high densities of 5 and 6 year old scallops were detected in the 2021 surveys. The CAII-SW area was combined with the CAII-Ext as an access area in FY2021. This configuration would afford the fleet access to 5- and 6-year-old year classes detected in the larger combined area and will allow vessels to operate in a larger continuous area. The five year old scallops in CAII-SW still have some growth potential, and harvesting before yield is optimized will sacrifice some potential biomass in the future.

6.2.4.1 Alternative 1 – No Action

No Action would set FT LA DAS at 18 and allocate one 18,000-pound trip to the Mid-Atlantic Access Area for full-time limited access vessels. This alternative is anticipated result in reduced levels of landings and area swept compared to all other alternatives and Status Quo. An 18,000 pound trip to the Mid-Atlantic Access Area would likely have negative biological impacts on the scallop resource in this region based on the results of the 2021 surveys.

6.2.4.2 Alternative 2 - Three Access Area trips, with the Hudson Canyon closed and closures of the New York Bight and Nantucket Lightship West

Alternative 2 would allocate full-time limited access vessels access area trips to Closed Area II and the Nantucket Lightship South (Map 6) with a possession limit of 15,000 pounds. Each full time Limited Access vessel would be allocated a total of 45,000 pounds to the following access areas: Closed Area II (30,000 pounds) and the Nantucket Lightship South (15,000 pounds). Alternative 2 would establish the combined New York Bight (NYB)/Hudson Canyon (HC) closure as well as the Nantucket Lightship West (NLS-West) closure (Map 3).

Alternative 2 would result in a low overall F rate depending on the option selected (F=0.23 or F=0.24), which is similar to the overall F rates of all other action alternatives under consideration in this action (except No Action), and well below the OFL. With respect to open area F rates, F=0.34 (20 DAS) and F=0.47 (26 DAS) could be expected to result in slight negative biological impacts relative to No Action (F=0.28). Since open area F rates are the average of all SAMS areas, the 26 DAS option could be expected to result in the highest F rates for Georges Bank areas.

6.2.4.3 Alternative 3 - Three Access Area Trips, with the Hudson Canyon and Elephant Trunk reverted to open bottom and closures of the New York Bight and Nantucket Lightship West

Alternative 3 would allocate full-time limited access vessels access area trips to Closed Area II and the Nantucket Lightship South (Map 6) with a possession limit of 15,000 pounds. Each full time Limited Access vessel would be allocated a total of 45,000 pounds to the following access areas: Closed Area II (30,000 pounds) and the Nantucket Lightship South (15,000 pounds). Alternative 3 is different from Alternative 2 because it would establish a closure in the New York Bight (NYB) area, but not in the Hudson Canyon (Map 6).

Alternative 3 would result in a low overall F rate depending on the sub-option selected (F=0.23 or F=0.25), which is similar to the overall F rates of all other action alternatives under consideration in this action (except No Action), and well below the OFL. With respect to open area F rates, F=0.33 (20 DAS) and F=0.45 (26 DAS) could be expected to result in slight negative biological impacts relative to No Action (F=0.28). Since open area F rates are the average of all SAMS areas, the 26 DAS option could be expected to result in the second highest F rates for Georges Bank areas.

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

The LAGC IFQ component is allocated a fleet wide total number of access area trips. Amendment 21 increased the LAGC IFQ access area trip limit from 600 pounds to 800 pounds per trip. Individual vessels are not required to take trips in specific areas like access area trips allocated to the LA fishery. After the total number of access area trips are determined, a maximum number of trips are identified by access area, and once that limit is reached, the area closes to all LAGC IFQ vessels for the remainder of the fishing year. Alternative 2 and Alternative 3 would redirect fishing effort out of Closed Area II to other parts of the scallop resource.

6.2.5.1 Alternative 1 – No Action (Default Measures from FW33)

Impacts of Alternative 1 are likely negligible at the stock level, but potentially slight negative on the scallop resource in nearshore areas and the Mid-Atlantic. Since the LAGC IFQ access area allocation is a proportion of the total LAGC IFQ allocation, and a much smaller proportion of total scallop catch, these removals do not have a major impact on the resource. Under default measures, the LAGC IFQ fleet would have a limited number of trips in the MAAA (571 at 600 pounds per trip) and would not be able to fish in several access areas which hold higher densities of larger scallops. Alternative 1 would likely have a slight negative to negligible biological impact relative to Alternative 2 and Alternative 3 because LAGC quota would primarily be harvested from open areas and the MAAA.

6.2.5.2 Alternative 2 - Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation to Closed Area I Only

Overall, this option could have negligible to potentially slight positive impacts on the resource overall by reducing fishing pressure on inshore open areas and providing more access to areas with higher biomass and catch rates. Alternative 2 would likely have a slight positive to negligible biological impact on the resource relative to Alternative 1 and Alternative 3. LAGC IFQ harvest from access areas would likely reduce impacts on the resource in open areas by allowing vessels to utilize their quota within rotational management areas, and specifically shifting allocations associated with CAII to CAI for the LAGC component

6.2.5.3 Alternative 3 - Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation evenly across the Nantucket Lightship-South and Closed Area I

Overall, this option could have negligible to potentially slight positive impacts on the resource overall by reducing fishing pressure on inshore open areas and providing more access to areas with higher biomass and catch rates. Alternative 3 would likely have a slight positive to negligible biological impact on the resource relative to Alternative 1. Relative to Alternative 2, the impacts would likely be slight negative to negligible since the LAGC fleet would did not fish their trips in the NLS-S in FY 2020 or FY 2021, which would result in more pressure on nearshore areas compared to sending all of the CAII allocation to CAI (Alternative 2), since all of the access area trips were taken in CAI in 2020 and 2021. LAGC IFQ harvest from access areas would likely reduce impacts on the resource in open areas by allowing vessels to utilize their quota within rotational management areas, and specifically shifting allocations associated with CAII to the NLS-South, and CAI for the LAGC component.

6.2.6 Action 5 – Additional Measures to Reduce Fishery Impacts

Scallop RSA compensation fishing is expected to constitute 3% of total scallop landings in FY 2021 (1.275 million pounds). Overall, removals from RSA compensation fishing represent a small proportion of fishery landings. While the Council is prescriptive about where RSA compensation can be fished, Alternative 1 and Alternative 2 are not expected to alter the status of the scallop resource

6.2.6.1 Alternative 1 – No Action

Alternative 1 (No Action) would prohibit vessels from fishing RSA compensation in access areas. This option would increase effort and removals in open areas, where LPUE is projected to be much lower than in access areas. The Council has developed alternatives is to set DAS at either 20 or 26 for FT LA vessels, noting unremarkable recruitment in resource surveys from 2016 – 2021. This option would be expected to slightly increase F in the open areas and have a slightly negative impact on that portion of the resource relative to Alternative 2. While No Action would have a slightly negative impact relative to Alternative 2, the overall impact on the stock would be expected to be negligible since projected landings are well below the OFL and ABC, and the RSA is very small part of the APL.

6.2.6.2 Alternative 2 - Allow RSA compensation fishing in the NLS-South, Closed Area II, and Closed Area I, with limited RSA compensation fishing in the NGOM Management Area

Alternative 2 could be expected to have negligible impacts on the scallop resource as a whole. Vessels would be allowed to fish RSA compensation pounds in all access areas open to the fishery, open bottom, and the NGOM management area (Map 8). Vessels would have a short seasonal window to fish in Closed Area II while the meat weight anomaly is high and discard to kept ratios for GB yellowtail and Northern windowpane are low. Vessels would not be able to fish RSA compensation pounds in any closed rotational areas, and only vessels receiving allocations of NGOM RSA compensation would be able to fish their awards in the NGOM management area.

Alternative 2 would expand where RSA compensation fishing can occur which would allow vessels to fish in areas with higher LPUE. The opportunity to fish in access areas could be expected to slightly reduce F in the open areas, and therefore have a slightly positive impact on that portion of the resource relative to Alternative 1. There is some potential for negligible to low-negative biological impacts on a finer scale if catch rates or availability of preferred market grades result in higher than anticipated fishing mortality in discrete areas. The

overall impact on the stock would be expected to be negligible since projected landings are well below the OFL and ABC, and the RSA is very small part of the APL.

6.3 Impacts on Non-target Species (Bycatch)

6.3.1 Action 1 – Overfishing Limit and Acceptable Biological Catch

The overfishing limit and acceptable biological catch are the landings limits the fishery is not allowed to exceed. As has been the case recent years, fishery allocations under consideration in this action (Section 4.3) are well below the OFL and ABC values for both Alternative 1 (No Action, default OFL and ABC from FW33) and Alternative 2 (Updated OFL and ABC). Neither Alternative 1 or Alternative 2 are expected to have a direct impact on non-target species because the anticipated level of effort, spatial distribution of scallop fishing activity, and projections of non-target species bycatch in FY2022 are not based on the OFL or ABC limits. Impacts to non-target species are, however, directly related to the fishery allocations (annual projected landings or 'APL') being considered in this action and are assessed below in Section 6.3.3.

6.3.2 Action 2 – Northern Gulf of Maine Management and TAL Setting

The Northern Gulf of Maine Management Area overlaps with part of the northern windowpane stock boundary. This area also overlaps with part of the Cape Cod/Gulf of Maine yellowtail stock boundary. Currently, bycatch estimates for these stocks are not stratified by the NGOM management area, and NGOM specific discard estimates are not developed for in-season catch accounting. However, to assess potential impacts, an analysis of Cape Cod/Gulf of Maine (CC/GOM) yellowtail and northern windowpane bycatch in the NGOM management area was completed in FW29 using audited data from the 18 observed LA trips in the NGOM between March 1, 2017 and March 23, 2017 (data provided by NEFOP staff). Catch data from the 443 observed hauls reported 164,039 lbs of kept scallops, along with 1,005 lbs of discarded CC/GOM yellowtail and 451 lbs of discarded northern windowpane. The d/K ratio (lbs of discarded fish/lbs of kept scallops) for CC/GOM yellowtail from these trips was 0.0061 and the d/K ratio for northern windowpane was 0.0028. Since there is no observer coverage of LAGC NGOM trips, the estimates from LA fishing in 2017 represent a reasonable approximation of what discard rates could be during the time of year that the NGOM is being fished in FY2021. The d/K ratios of CC/GOM and northern windowpane are very low, as is approximate bycatch of northern windowpane and CC/GOM yellowtail associated with the NGOM TAC options for FY2021 (Table 53).

Overall, while potential bycatch under Alternative 1 is expected to be lower compared to the options of Alternative 2, bycatch of windowpane and yellowtail flounder is expected to be low relative to the overall catch limits for these stocks for both alternatives. Alternative 1 or Alternative 2 are not expected to directly impact the overfishing/overfished status of these stocks or result in the overall ACLs to be exceeded. Therefore, considering the above, the impacts of Alternative 1 and Alternative 2 to non-target species are expected to be negligible overall and negligible in comparison to one another.

Table 53 - Comparison of possible CC/GOM yellowtail and northern windowpane bycatch for the NGOM management area in FY 2022, based on NGOM TAL options and d/K estimates from FY2017.

Section	Alt.	F rate	2022 NGOM TAL	CC/GOM YT bycatch (lbs)	Northern Windowpane Bycatch (lbs)	Bycatch Estimate (lbs) of YT and Windowpane
				(2017 d/k: 0.0061)	(2017 d/k: 0.0028)	
4.2.1	Alt. 1		74,000	451	207	659
4.2.2.1	Alt. 2 O 1	F=0.15	559,974	3,416	1,568	4,984
4.2.2.2	Alt. 2 O 2	F=0.18	661,387	4,034	1,852	5,886
4.2.2.3	Alt. 2 O3	F=0.20	727,525	4,438	2,037	6,475

6.3.3 Action 3 – Fishery Specifications and Rotational Management

The alternatives under this action set FY 2022 open area and access trip allocations for the fishery. Default specifications for FY 2023 are also established. The Council considered a total of four allocation options. In addition to Alternative 1/No Action, two rotational management approaches (Alternatives 2-3) were developed, each with two options for open area F values (Table 8). No Action includes default open area DAS and access to the Mid-Atlantic Access Area, but not access to Georges Bank access areas, so it is quite distinct from the action alternatives. A status quo scenario, which was not formally considered as an alternative, and is different from the No Action/default allocations, was evaluated for comparison to current management. The status quo alternative applies FY 2021 specifications for 2022 (i.e., considering changes in biomass that have occurred). The rotational access areas open under status quo differ from the action alternatives.

Table 54 shows the FY2022 scallop fishery bycatch projections for Georges Bank yellowtail, SNE/MA yellowtail, northern windowpane, and southern windowpane, relative to the anticipated scallop fishery sub-ACLs for each of these stocks. The following impacts to non-target species are analyzed collectively for Alternative 2 and Alternative 3 due to the bycatch projections being extremely similar for both alternatives.

Under Alternative 2 and Alternative 3, the majority of open area and access area fishing effort is expected to occur on Georges Bank. This is based on several factors: 1) access area trips are only being considered for areas on Georges Bank (i.e., CAII, NLS-South); 2) open areas of eastern Georges Bank hold the majority of open area exploitable biomass and are expected to have higher catch rates than open areas elsewhere in the resource; and 3) lower anticipated catch rates in the Mid-Atlantic region as well as the area closures being considered in Framework 34 of the NYB and(or) Hudson Canyon will likely push effort that would have occurred in these areas onto Georges Bank. The projection model forecasts that vessels will likely target higher density areas of eastern Georges Bank, specifically the Southern Flank (SF) SAMS area, and to a lesser extent the Northern Flank (NF) SAMS area while on open bottom trips. Both of these areas fall within the Georges Bank yellowtail and northern windowpane stock areas. There is less certainty in the bycatch projections for open areas because actual fishing behavior may not reflect predictions that the bycatch projections are based on. For example, if there is more open bottom fishing in the Mid-Atlantic than expected, bycatch of southern windowpane flounder may be higher than forecast, and northern windowpane bycatch may be lower. The projections are based on forecasts of scallop biomass and fishing behavior and also are subject to error associated with the flatfish bycatch data used in the

bycatch calculation; for example, these variables could result in error as high as 50% (i.e., bycatch projections could be 50% higher or lower than estimated).

The projections are forecasts (with error) and should not be interpreted as precise estimates. For example, the bycatch of northern windowpane is projected to be 20 times higher from open areas on Georges Bank than in rotational access areas, despite roughly 1/3 of total projected landings coming the CAII access area. Realized bycatch may be higher or lower than forecasted, which is supported by previous experiences. Past estimates have been both over- and under-estimated realize bycatch, even in years when significant data limitations were not a major obstacle.

The northern windowpane bycatch projections for FY2022 exceed the anticipated scallop fishery sub-ACL, but does not exceed the ABC for this stock (2022 ABC = 160 mt). This is not the first time that the northern windowpane sub-ACL has been projected to be exceeded; for example, the scallop fishery was expected to exceed the northern windowpane sub-ACL in fishing year 2020 and the year end catch estimates proved that to be the case, with the scallop fishery catching 34.8 mt (~290% of its sub-ACL). As a result of this overage, the reactive large accountability measure for northern windowpane will be triggered for FY2022, meaning a gear restriction will be required for all fishing occurring in Closed Area II for the entirety of FY2022. FY2022 will be the first year that the modified gear is required on Georges Bank, which is expected to have a positive effect on bycatch of both Georges Bank yellowtail and northern windowpane flounder. If the bycatch in CAII is underestimated, use of the modified gear in CAII in FY2022 is expected to decrease bycatch of both northern windowpane and GB yellowtail.

While northern windowpane remains at low levels relative to historic biomass, the 2020 assessment update[11] noted that area swept biomass for this stock has continually increased since 2017. The swept area biomass of northern windowpane was estimated at 12,505 mt in 2019, and with increasing biomass comes the potential for increasing scallop fishery bycatch of this stock. Even still, the upper end of projected bycatch of northern windowpane for FY2022 equates to less than 10% of biomass estimated through 2019.

Aside from northern windowpane, projections for all other stocks allocated a sub-ACL are at or below the anticipated sub-ACLs for FY2022. The southern windowpane projections are notably lower compared to projections from the past several years. This is a result of effort shifting out of the Mid-Atlantic region (i.e., out of the southern windowpane stock area), and onto Georges Bank. The Nantucket Lightship South has been an area with higher southern windowpane catch; while this area is expected to support scallop effort in FY2022, the level of effort is expected to be lower compared to FY2021 and FY2020, which also contributed to the southern windowpane projected bycatch decreasing.

Despite the projection for northern windowpane exceeding the FY2022 sub-ACL, this level of bycatch is not expected to cause the overall ACL for this stock to be exceeded under Alternative 1, Alternative 2, or Alternative 3, meaning the overall impact to this stock is expected to be negligible. As stated previously, the bycatch projections for all other stocks allocated a sub-ACL are at or below the anticipated sub-ACLs for FY2022, and are not expected to result in the overall ACLs being exceeded for any of the flatfish stocks. Considering this, the overall impact of Alternative 1, Alternative 2, and Alternative 3 to non-target species is expected to be negligible. Given the similarities in all options with respect to potential bycatch, the impact of Alternative 1, Alternative 2, and Alternative 3 are expected to be negligible in comparison to one another.

[11] Northern windowpane flounder 2020 assessment update report: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2020_FLD_GMGB_RPT.pdf

Table 54 - Overview of FY2022 projected scallop fishery bycatch estimates for the range of alternatives being considered in FW34, including the anticipated FY2022 scallop sub-ACL for each stock.

Alternative	Scenario		GB YT	SNE/MA YT	GOM/GB WP	SNE/MA WP
Anticipated 2022 sub-ACL		GB Closure	*19 mt*	*2 mt*	*31 mt*	*129 mt*
Alternative 2	2 trips to CAII AA at 15,000 per trip (30K total) 1 trip to NLS-South at 15,000 pounds 20-26 DAS New York Bight and Hudson Canyon Closed	CAII-East closed	15-19 mt	2-3 mt	89-115 mt	74-82 mt
Alternative 3	2 trips to CAII AA at 15,000 per trip (30K total) 1 trip to NLS-South at 15,000 pounds 20-26 DAS New York Bight Closed	CAII-East closed	15-19 mt	2-3 mt	86-111 mt	73-81 mt
Methods and data caveats associated with these projections can be found here.						

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

The LAGC IFQ component is allocated 5.5% of the access area allocations and a fleet wide total number of access area trips. Therefore, bycatch of non-target species in the LAGC IFQ fishery are relatively small when compared to the amount of bycatch by the entire scallop fishery over the course of the year.

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

Alternative 1 (No Action) would use the default number of trips allocated in FW33 (571 total trips in MAAA with a 600-pound possession limit, starting on April 1). A total of 1,071 access area trips would be allocated to the LAGC component under Alternative 2 and Alternative 3, with the only difference between the two options being how Closed Area II trips are distributed. Under Alternative 2, all access area trips that would have been allocated to Closed Area II would instead be allocated to Closed Area I. Under Alternative 3, all access area trips that would have been allocated to Closed Area II would instead be allocated evenly between Closed Area I and the Nantucket Lightship South (Table 59).

All options considered under Action 4 (Alternative 1, Alternative 2, and Alternative 3) would redirect fishing effort by the LAGC IFQ component out of Closed Area II to other parts of the scallop resource. Effort by the LAGC component is a relatively small portion of total effort by the scallop fishery as a whole, and corresponding bycatch is also a small part of the total estimated bycatch. Redirecting effort from Closed Area II is expected to reduce bycatch of Georges Bank yellowtail flounder and northern windowpane flounder if LAGC effort redirects

to parts of the scallop resource that are outside of the stock area. The impacts of redirecting LAGC effort out of CAII are likely to vary for by stocks. For example, if the LAGC elects to redirect effort to the SNE YT stock area, this could have slight negative impacts by increasing bycatch of a stock that is overfished. Conversely, if the LAGC elects to fish in the CC/GOM stock area, there could be positive impacts since CC/GOM YT is considered healthy as of the last assessment.

The nature of the LAGC IFQ fishery is such that vessels are motivated to fish areas with high LPUE, thereby reducing area swept and ultimately minimizing catch of non-target species. It is also important to note that occurrences of high bycatch of non-target species in the LAGC IFQ fishery are relatively minimal when compared to the amount of bycatch by the entire fishery over the course of the year. This is true for all Alternatives being considered in Action 4.

In any scenario, the Alternatives being considered under Action 4 are not expected to result in levels of bycatch of allocated flatfish stocks that would contribute to ACLs for those stocks to be exceeded. Therefore, the direct impacts of Alternative 1, Alternative 2, and Alternative 3 are expected to be negligible overall, as well as negligible in comparison to one another.

6.3.5 Action 5 – Additional Measures to Reduce Fishery Impacts

There are two alternatives are under consideration related to RSA compensation fishing in access areas. Alternative 1 (No Action) would prohibit vessels from fishing RSA compensation in access areas (i.e., compensation fishing would be limited to the open area). Alternative 2 would allow vessels to harvest RSA compensation pounds in the open area, Nantucket Lightship South, Closed Area I, Closed Area II (prior to the seasonal closure) and the Northern Gulf of Maine Management Area (up to the research set-aside portion of the NGOM TAL, 25,000 pounds).

Allowing RSA compensation fishing in all available access areas in addition to open area is expected to spread effort out across the resource. Vessels will likely target areas with high LPUE and higher meat yield when compensation fishing – fishing in areas with high LPUE means it will take less time for vessels to harvest compensation pounds, which could be expected to reduce area swept and associated bycatch of non-target species overall.

GB yellowtail and northern windowpane flounder bycatch tends to be higher in Closed Area II relative to other parts of the resource within the boundaries for these respective stocks; however, bycatch of both stocks vary seasonally, and Alternative 2 limits any RSA compensation in Closed Area II to the summer months prior to the CAII seasonal closure, which corresponds with the time of year when bycatch is the lowest. Considering this and acknowledging that RSA compensation fishing represents a small portion of annual scallop effort and landings (i.e., less than 4% of the projected FY2022 APL), the impact of RSA compensation fishing on non-target species is expected to be negligible relative to impacts from the fishery as a whole.

6.3.5.1 Alternative 1 – No Action

Alternative 1 would prohibit RSA compensation fishing in access areas.

Overall impacts of Alternative 1 on non-target species are likely to be negligible since RSA compensation fishing effort is a relatively small proportion of overall scallop fishing effort, around 4% the projected landings (1.275 million pounds). Impacts on non-target species may vary depending on where and when RSA compensation fishing occurs in the open area. LPUE is expected to be higher in access areas compared to the open area in FY2021 due to higher densities of scallops and greater meat yield being in access areas. By not allowing RSA compensation fishing in areas with higher LPUE and better meat yield, the time it takes to harvest compensation pounds will likely be elevated if vessels are only able to fish in the open bottom. More time spent fishing under Alternative 1 means that area swept will likely be greater, which in turn could lead to increases in bycatch of non-target species relative to Alternative 2, which allows RSA compensation fishing in all available access areas.

Though bycatch may be somewhat elevated under Alternative 1 relative to Alternative 2, the overall impacts of either option on non-target species are expected to be negligible because RSA compensation fishing represents a small portion of annual harvest (i.e., 1.275 million pounds, less than 4% of annual projected landings).

6.3.5.2 Alternative 2 – Allow RSA compensation fishing in the Mid-Atlantic Access Area, NLS-South, Closed Area II, and Closed Area I, with limited RSA compensation fishing in the NGOM Management Area

Alternative 2 would allow RSA compensation fishing in all available access areas (i.e., CAI, CAII, NLS-South), the open area, and in the NGOM Management Area up to research set-aside contribution of the NGOM TAL (i.e., 25,000 pounds). RSA compensation fishing in Closed Area II would be allowed between the start of FY2022 (April 1) and the start of the Closed Area II seasonal closure on August 15th.

Though bycatch may be similar or somewhat reduced under Alternative 2 relative to Alternative 1, the overall impacts of either option on non-target species are expected to be negligible because RSA compensation fishing represents a small portion of annual harvest (i.e., 1.275 million pounds, less than 4% of annual projected landings) and the direct impacts of this level of harvest are not expected to implicate the stock status of any non-target species.

While bycatch of GB yellowtail and northern windowpane does tend to be higher in Closed Area II and on eastern Georges Bank than other parts of the resource, limiting compensation fishing to the late spring and early summer months in CAII is not expected to have notable impacts to these flatfish stocks because observed bycatch rates have been the lowest during this time period. Meat yield on eastern Georges Bank is at its highest during this time window, meaning that vessels will be able to harvest compensation pounds with less area swept compared to other times of the year when meat yield is lower. Therefore, fishing when bycatch is the lowest and meat yield is highest could be expected to minimize any impacts to non-target stocks in Closed Area II as a result of compensation fishing.

Bycatch of non-target species is expected to be minimal in the NLS-South, meaning additional effort from RSA compensation fishing in these areas is not expected to result in notable impacts to non-target species. Closed Area I will be accessible to the FT LA fleet when compensation fishing; considering the small amount of exploitable biomass in this area, RSA compensation fishing is expected to be minimal in CAI, as would any impacts to non-target stocks that are present in this area. As discussed in Section 6.3.2, the impacts of compensation fishing in the NGOM are expected to be negligible due to the minimal amount of bycatch associated with the portion of the NGOM TAL available to support research (i.e., 25,00 pounds).

6.4 Impacts on Protected Species

6.4.1 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 FY 2022 and FY 2023 OFL and ABC values that were approved by the SSC and recommended to the Council are summarized in Table 4. The updated ABC estimate excluding discards is 25,724 mt for FY2022. This is 2,350 mt lower than the No Action ABC (default) (Table 2). The current OFL and ABC values are driven by the large year classes in Nantucket Lightship area and the Mid-Atlantic Access Area being fished down over time with minimal recruitment expected for the 2022 fishing year. 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 protected species for this framework will largely reflect measures discussed in Section 6.5, and are only indirectly related to the ABC and OFL values.

6.4.1.1 Alternative 1 – No Action for OFL and ABC

The scallop fishery is prosecuted with scallop dredge and bottom trawl gear. As provided in Section 5.4, ESA listed species of sea turtles and Atlantic sturgeon are at risk of interaction with these gear types, with interactions often resulting in injury or mortality to the species. Based on this, the scallop fishery is likely to result in some level of negative impacts to ESA listed species of sea turtles and Atlantic sturgeon. Taking into consideration fishing behavior/effort under this alternative, as well the fact that interaction risks with protected species are strongly associated with the amount of gear in the water, gear soak or tow duration, as well as the area of overlap, either in space or time, of the gear and a protected species (with risk of an interaction increasing with increases in of any or all of these factors), we determined the level of negative impacts to ESA listed species of sea turtles and Atlantic sturgeon to be low. Below, we provide support for this determination.

Under "No Action", the overall OFL and ABC would be at the default values for FY2022, which were adopted by the Council through FW33. The No Action ABC including discards is 32,872 mt or about 72 million pounds. The No Action OFL including discards is 41,926 mt or roughly 92 million pounds. The ABC and OFL under Alternative 1 (No Action) are greater than the range of ABC and OFL values that were authorized by the fishery in some years between 2012 and 2016 but are lower than the values authorized for 2017 through 2021 (Table 55). The OFL and ABC are not a direct measure of the Annual Projected Landings (APL) for the scallop fishery and are therefore, not a direct measure of expected fishing behavior under such specifications. Furthermore, APL estimates associated with fishery allocations being considered in this action (see Section 4.1, Table 5) are consistent with the range of removals that have been authorized by the fishery since 2012 and do not exceed the ABC and OFL values specified in Alternative 1 (No Action). In addition, projected landings for FY2022 are lower compared to scallop fishery landings in the past several years, and therefore, changes in fishing behavior and effort are not expected to differ greatly from what has been previously observed in the fishery.

As noted above, interaction risks with protected species are strongly associated with amount, time, and location of gear in the water. As fishing behavior and expected levels of effort under the No Action are not expected to change any of these operating conditions, the No Action is not expected to introduce new or elevated interaction risks to ESA listed species of sea turtles and Atlantic sturgeon. Given this, and the fact that this action would still require compliance with sea turtle chain mat and TDD regulations, Alternative 1 (No Action) would likely have slight negative impacts on ESA listed species of sea turtles and Atlantic sturgeon. Relative to Alternative 2, the No Action alternative would result in negligible impacts to ESA-listed species because the OFL and ABC values in and of themselves under either alternative are not expected to change fishing behavior and effort in a manner that significantly differs from status quo conditions.

Table 55 – Overfishing limit (OFL) and acceptable biological catch (ABC) values from fishing year 2011 to 2021.

Fishing Year	OFL	ABC
2011	32,387	27,269
2012	34,382	28,961
2013	31,555	21,004
2014	30,419	20,782
2015	38,061	25,352
2016	68,418	37,852
2017	75,485	46,737
2018	72,055	45,950
2019	73,421	57,003
2020	56,186	45,414
2021	47,503	36,435

6.4.1.2 Alternative 2 – Updated OFL and ABC for FY2021 and FY2022 (default)

The OFL and ABC values approved by the SSC for FY2022 and FY2023 (default) under Alternative 2 are summarized in Table 4. The updated ABC including discards is 30,305 mt or approximately 67 million pounds for FY2022. This is 2,567 mt, or about 5.7 million pounds, lower than the No Action ABC for FY2022 (Alternative 1, default measures from FW33). Updated survey results suggest a decrease in biomass, primarily due to the large year classes on Georges Bank and the Mid-Atlantic being fished down with only marginal recruitment occurring over the past several years. Another driving factor in the reduction of the ABC and OFL is that the reference points for these values were adjusted downward through the 2020 scallop assessment update (NEFSC 2020).

The default OFL and ABC values for FY2023 under Alternative 2 represent a continued decline from the record high levels in recent years. This decline is attributed to the extraordinarily large 2012- and 2013-year classes recruiting to the fishery and the absence of strong recruitment in subsequent years. These exceptionally strong year classes make up the majority of total biomass and, except for the slow growing deep-water scallops in the Nantucket Lightship, are responsible for the majority of the population being considered exploitable.

Under Alternative 2, the proposed OFL and ABC for FY2022 are greater than the range of ABC and OFL values that were authorized by the fishery in some years between 2012 and 2016 but are lower than the values authorized for 2017 through 2021 (Table 55). The increase in the ABC and OFL between FY2017 and FY2019, roughly similar values between FY2019 and FY2020, and a reduction between FY2020, FY2021, and FY2022, reflects the higher estimates of scallop biomass observed in recent surveys of the scallop resource and the leveling off and steady decline of this scallop biomass as the large year classes continue to be fished with a lack of subsequent recruitment. Though similar to the historically higher values estimated for the past several years, the OFL and ABC values associated with Alternative 2 are not a direct measure of the APL allocated to the fishery, and therefore are not a direct measure of expected fishing behavior under such specifications. In fact, fishery allocations are projected to result in significantly lower landings than the OFL and ABC limits under Alternative 2 and are similar to projected landings over the past 6 years. Based on this, the OFL and ABC in and of themselves are not expected to change fishing behavior and effort in a manner that significantly differs from status quo conditions or under Alternative 1. As a result, impacts on ESA listed species of sea turtles and Atlantic sturgeon under Alternative 2 are expected to be like those assessed for Alternative 1, slight negative; therefore,

relative to Alternative 1, Alternative 2 is likely to result in negligible impacts on ESA listed species of sea turtles and Atlantic sturgeon.

6.4.2 Action 2 – Northern Gulf of Maine TAL Setting

6.4.2.1 Alternative 1 – No Action

Alternative 1 would set the total NGOM TAC for FY2022 at 74,000 pounds and would maintain the closure of Stellwagen Bank, as specified in the default measures for the NGOM through Framework 33. This alternative would not implement the changes to the NGOM management area made in Amendment 21, such as the updated allocation sharing arrangement that is described in Alternative 2.

Alternative 1 (No Action) represents a reduction in the overall NGOM TAC relative to FY2021 meaning that, while the rate of harvest from the LAGC component is expected to be similar, the overall duration of the LAGC NGOM fishery is expected to be abbreviated relative to FY2021. In other words, under Alterative 1 (No Action), the LAGC share of the NGOM TAC would likely be harvested by early May.

Since the LAGC portion of the NGOM fishery is expected to end by early May, fishing activity is not expected to have a substantial overlap with the seasonal distribution of hard-shell turtles in the Gulf of Maine (GOM). Specifically, as provided in Section 5.4.2.1, hard-shell sea turtles migrate north as water temperatures warm in the spring and may be seen on the most northern foraging grounds in the GOM beginning in June (Shoop & Kenney 1992). Leatherback sea turtles are also likely to occur in the GOM within a similar timeframe as hard-shell sea turtles (Dodge et al. 2014; James et al. 2005; James et al. 2006; NMFS & USFWS 1992). Based on this, if the fishery closes in May, interactions with turtles are not expected.

Due to the structure of a shared overall TAC and the uncertainty associated with the timing of if, when, and(or) how much of the LAGC and LA share is harvested, there is potential that fishing activity at some level could persist within the NGOM management area beyond the month of May. Under this unlikely scenario, there is the potential for sea turtles to be present in the NGOM management area and therefore, encounter scallop fishing gear (i.e., primarily dredge) known to pose an interaction risk to sea turtles, particularly hard-shelled species. Generally, the rate in which the LAGC share of the NGOM TAC is harvested is an indication of the total number of vessels fishing in the area and catch rates (i.e., LPUE). When high densities of exploitable scallops are present in the NGOM, more vessels tend to participate in this part of the fishery because high catch rates low operating costs make trips viable. Under this scenario, derby-style fishing can occur and the LAGC portion of the NGOM TAC tends to be harvested quickly; examples of this scenario were seen in 2016, 2017, 2018, 2019, 2020, and 2021, when an increase in LAGC vessel participation was seen, catch rates were high due to high densities of exploitable scallops, and the TAC was harvested in under two months. On the other hand, when exploitable biomass is low, the overall NGOM TAC tends to be lower, and vessel participation may decrease because fishermen defer to other fishing opportunities that are more economically viable. Examples of this scenario were seen in 2009 through 2015, when the NGOM TAC, vessel participation, and overall effort were lower compared to more recent years, and the area remained open the entire year because the NGOM TAC was not harvested. Under either scenario, LA vessels that receive NGOM RSA compensation pounds are able to operate independently of the LAGC component in the NGOM; in other words, eligible LA vessels can choose to fish in the NGOM at any time during the fishing year, regardless of whether the LAGC share of the NGOM TAC has been harvested, or, they can elect to fish NGOM RSA compensation pounds outside of the NGOM. Therefore, considering each of the above scenarios, if the NGOM management area were open to the LAGC component for the entire year, it would indicate that fishing effort by the LAGC component is low, likely as a result of low exploitable biomass and low catch rates. In this situation, considering that LA vessels can choose to fish NGOM RSA either inside or outside the NGOM, it is highly likely that LA vessels would choose to fish NGOM RSA pounds in other parts of the resource where catch rates are higher. Taking into consideration expected effort under this scenario by both the LAGC and LA fishery in the NGOM management area, sea turtle occurrence and

distribution in the GOM, as well as observed sea turtle interactions with scallop fishing gear in the GOM, the risk of an interaction is expected to be low and no greater than past years.

Based on this information, given the low levels of effort expected in the NGOM management area under this scenario, gear quantity and(or) duration of tow times under Alternative 1 are not expected to increase relative to current operating conditions. As interactions with protected species are strongly associated with the amount of gear in the water, gear soak or tow time, as well as the area of overlap, either in space or time, of the gear and a protected species (with risk of an interaction increasing with increases in of any or all of these factors), fishing behavior/effort under Alternative 1 is not expected to change any of these operating conditions and therefore is not expected to elevate interaction risks. This is further supported by the low level of co-occurrence between hard-shelled sea turtles and scallop gear in this sub-region, especially considering that hard-shelled sea turtle interactions with scallop fishing gear in the Gulf of Maine are non-existent (FSB 2015; 2016; 2017; 2018; Murray 2011; 2013; 2015a; c; Murray & Orphanides 2013a; NMFS 2012; Warden 2011a; c) and that hard-shelled sea turtles are generally less common in the Gulf of Maine relative to the Mid-Atlantic. Although there is the possibility for leatherback sea turtles to interact with scallop fishing gear (NMFS 2012), based on fisheries observer data (FSB 2019), as well as data provided by the Greater Atlantic Region Sea Turtle Disentanglement Network (GAR STDN, unpublished data) , leatherback sea turtle interactions with scallop fishing gear have never been observed, and therefore, while the risk of interaction exists, it is likely very low. Taking all these factors into consideration, should the fishery continue throughout the season, new or elevated (e.g., more gear, longer tow times) interaction risks to sea turtles are not expected under this scenario.

Atlantic sturgeon are known to occur in the Gulf of Maine year-round and are vulnerable to interactions with scallop fishing gear; however, the risk is expected to be low. Specifically, 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 1989-2019 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 (FSB 2015; 2016; 2017; 2018; 2019). However, NEFOP observer data has recorded one (1) Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (FSB 2015; 2016; 2017; 2018; 2019). Based on this information, as well as the information provided above regarding fishing effort and interaction risks to protected species, new or elevated (e.g., more gear, longer soak or tow times) interaction risks to Atlantic sturgeon are not expected under the No Action.

Based on the above, the impacts on protected species (i.e. ESA listed species of sea turtles and Atlantic sturgeon) from Alternative 1 would likely be negligible to slight negative. The NGOM TAC under Alternative 1 is lower than the NGOM TAL Options of Alternative 2 by 485,974 pounds (Option 1, F=0.15), 587,387 pounds (Option 2, F=0.18), and 653,525 pounds (Option 3, F=0.20), respectively. Given the higher catch limits being considered under Alternative 2, it is anticipated that the NGOM season will extend beyond the timing experienced in FY2016-FY2021 (i.e., NGOM closure by the end of April to mid-May). It is difficult to state how much longer the fishery might be operating in the NGOM under Alternative 2 because the main variable driving the duration of the fishing season is the level of participation (i.e., number of active vessels). Participation could increase significantly under either Alternative 1 or Alternative 2 because vessels with LAGC A (IFQ) and LAGC B/C permits could choose to fish the NGOM Set-Aside; however, it is more likely that participation would increase under Alternative 2 because of the higher catch limits and re-opening of Stellwagen Bank, which is expected to support high catch rates of exploitable scallops. Should the level of participation observed in recent years continue (i.e., approximately 40 active vessels), it is possible that the NGOM fishery could persist throughout summer months. However, if participation increases, the NGOM fishery would conclude earlier depending on how many more vessels become active in the NGOM. There are roughly 427 LAGC IFQ, LAGC NGOM, and LAGC Incidental permits in the fishery; while it is highly unlikely that this number of vessels would activate in the NGOM, this represents the upper bound of possible participation Under Alternative 2.

In either scenario, impacts to protected species would be greater under Alternative 2 relative to Alternative 1, meaning the impacts of Alternative 1 could be slightly positive relative to the options of Alternative 2.

6.4.2.2 Alternative 2 – Re-open Stellwagen Bank and set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY2022 and FY2023 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Alternative 2 would also re-open the Stellwagen Bank closure area (see Map 1) to directed scallop fishing.

There are three options being considered under Alternative 2, which specify TALs based on fishing mortality rates of 0.15 (Option 1), 0.18 (Option 2), and 0.20 (Option 3). The resulting TALs from these options are 559,974 pounds (Option 1), 661,387 pounds (Option 2), and 727,525 pounds (Option 3), respectively. All three options fall under the 800,000-pound NGOM Set-Aside trigger, meaning the remainder of the NGOM TAL after set-asides are removed will be allocated as NGOM Set-Aside, available to directed LAGC fishing only.

Taking into consideration fishing behavior/effort under this alternative, as well the fact that interaction risks with protected species are strongly associated with the amount of gear in the water, gear soak or tow duration, as well as the area of overlap, either in space or time, of the gear and a protected species (with risk of an interaction increasing with increases in of any or all of these factors), impacts of Alternative 2 on ESA-listed species of sea turtles and Atlantic sturgeon are expected to be slight negative for all Options. Support for this determination is provided below

The options of Alternative 2 represent the highest catch limits considered for the NGOM in history. The NGOM fishery is expected to extend longer than what has typically been observed (i.e., NGOM fishery concluding between late April and mid-May) in recent years due to the higher catch limits being considered under Alternative 2. However, as stated above, it is challenging to state how much longer the NGOM fishery might persist. The main variable driving the duration of the fishing season is the level of participation (i.e., number of active vessels). Participation could increase significantly under either Alternative 1 or Alternative 2 because any vessels with LAGC A (IFQ) and LAGC B/C permits could choose to fish the NGOM Set-Aside; however, it is more likely that participation would increase under Alternative 2 because of the higher catch limits and re-opening of Stellwagen Bank, which is expected to support high catch rates of exploitable scallops. Should the level of participation observed in recent years continue (i.e., approximately 40 active vessels), it is possible that the NGOM fishery could persist throughout the summer months. However, if participation increases, the NGOM fishery would conclude earlier depending on how many more vessels become active in the NGOM. There are roughly 427 LAGC IFQ, LAGC NGOM, and LAGC Incidental permits in the fishery; while it is highly unlikely that this number of vessels would activate in the NGOM, this represents the upper bound of possible participation Under Alternative 2.

As interactions with protected species are strongly associated with the amount of gear in the water, gear soak or tow time, as well as the area of overlap, either in space or time, of the gear and a protected species (with risk of an interaction increasing with increases in of any or all of these factors), fishing behavior/effort under Alternative 2 could increase, meaning there could be some increased risk of interaction with protected species compared to current conditions. However, while the risk of interaction may be somewhat elevated, it is important to note the low level of co-occurrence between hard-shelled sea turtles and scallop gear in this sub-region, especially considering that hard-shelled sea turtle interactions with scallop fishing gear in the Gulf of Maine are non-existent (FSB 2015; 2016; 2017; 2018; Murray 2011; 2013; 2015a; c; Murray & Orphanides 2013a; NMFS 2012; Warden 2011a; c) and that hard-shelled sea turtles are generally less common in the Gulf of Maine relative to the Mid-Atlantic. Although there is the possibility for leatherback sea turtles to interact with scallop fishing gear (NMFS 2012), based on fisheries observer data (FSB 2019), as well as data provided by the Greater Atlantic Region Sea Turtle Disentanglement Network (GAR STDN, unpublished data) , leatherback sea turtle interactions with scallop fishing gear have never been observed, and therefore, while the risk of interaction exists, it is likely very low, even at the greater levels of effort expected under Alternative 2. Taking all these factors into consideration, should the fishery continue throughout the season, new or elevated (e.g., more gear, longer tow times) interaction risks to sea turtles are not expected under this scenario.

Atlantic sturgeon are known to occur in the Gulf of Maine year-round and are vulnerable to interactions with scallop fishing gear; however, the risk is expected to be low. Specifically, 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 1989-2019 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 (FSB 2015; 2016; 2017; 2018; 2019). However, NEFOP observer data has recorded one (1) Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (FSB 2015; 2016; 2017; 2018; 2019). Based on this information, as well as the information provided above regarding fishing effort and interaction risks to protected species, new or elevated (e.g., more gear, longer soak or tow times) interaction risks to Atlantic sturgeon are not expected under the options of Alternative 2.

In any scenario, impacts to protected species would be greater under Alternative 2 relative to Alternative 1, meaning the impacts of Alternative 2 could be slightly negative relative to Alternative 1.

6.4.3 Action 3 – Fishery Specifications and Rotational Management

The alternatives under this action set FY 2022 open area and access trip allocations for the fishery. Default specifications for FY 2023 are also established. The Council considered a total of four allocation options. In addition to Alternative 1/No Action, two rotational management approaches (Alternatives 2-3) were developed, each with two options for open area F values (Table 8). No Action includes default open area DAS and access to the Mid-Atlantic Access Area, but not access to Georges Bank access areas, so it is quite distinct from the action alternatives. A status quo scenario, which was not formally considered as an alternative, and is different from the No Action/default allocations, was evaluated for comparison to current management. The status quo alternative applies FY 2021 specifications for 2022 (i.e., considering changes in biomass that have occurred). The rotational access areas open under status quo differ from the action alternatives.

Table 56 shows landings, LPUE, and area swept by alternative, Table 57 provides a matrix of comparisons for the area swept values only, and Table 58 provides a matrix of the relative differences in area swept values between alternatives in terms of percent difference.

Impacts of scallop fishing on protected resources is gauged by the level of scallop effort that overlaps with regions where protected resource species are typically observed and is measured by projected area swept (see Table 57). Interaction risks with protected species, such as sea turtles and Atlantic sturgeon, are strongly associated with the amount of gear in the water, gear soak or tow time, as well as the area of overlap, either in space or time, of the gear and a protected species, with risk of an interaction increasing with increases of any or all of these factors. Any alternatives that will result in a low projected area swept (i.e., higher landings per unit of effort) would reduce the overall time gear is deployed in the water, thereby reducing the potential for interactions. The level of impact measured using these points of reference varies very little when comparing Alternatives except for Status Quo because all alternatives are very similar in terms of the level of expected harvest, the parts of the resource that are expected to be fished, and associated area swept by the scallop fishery as a whole.

The majority of exploitable biomass accounted for in the current OFL and ABC estimates is located the Closed Area II and Nantucket Lightship regions. These areas are the only candidate access areas being considered for FY 2022. Most of the scallops in the NLS region are from the 2012 NLS year class, now10 years old, which were considered exceptional when they were first observed. The growth of these animals has leveled off, and these year classes have now been fished for several years. The future of the scallop fishery is likely on eastern Georges Bank following recruitment events in this region.

Given this distribution of biomass, both specification alternatives close CAII-East to protect small scallops and use the same access area configurations the NLS-South and CAII (CAII-SW and CAII-Ext). Both alternatives consider the same access area allocations and days at sea options, and only differ in the configuration of a closure in the New York Bight and(or) Hudson Canyon areas (i.e., Alternative 2 closes both areas, Alternative 3 only

closes the Hudson Canyon). The former MAAA is reverted to open under both alternatives, excluding the area the falls within the NYB or NYB/Hudson Canyon closures (see Map 3 and Map 6). Each alternative has options to allocate either 20 DAS (open area ranging from F=0.33 to 0.34) or 26 DAS (open area ranging from F=0.45 to 0.47). Given the similarities between alternatives in terms of spatial patterns of effort and area swept, the impacts to protected species are therefore expected to be broadly similar between the different approaches, with effects scaling according to the magnitude of effort in each area.

Table 56 – Summary of projected landings, overall landings per unit of effort (LPUE), bottom area swept (nm^2), and relative habitat efficiency (landings/area swept) for alternatives under consideration in Framework 33.

Alternative	Description	Projected Landings	LPUE Estimate	Area Swept (nm2)	Landings (mt)/Area Swept (nm2)
1	No Action	19,940,812	2,322	3,546	2.6
2.1	3 trips, 20 DAS, NYB/HC closed	31,667,199	2,440	2,519	5.7
2 22DAS	3 trips 22 DAS, NYB/HC closed	33,150,910	2,422	2,810	5.4
2 24DAS	3 trips 24 DAS, NYB/HC closed	34,605,961	2,403	3,119	5.0
2.2	3 trips 26 DAS, NYB/HC closed	36,030,147	2,384	3,448	4.7
3.1	3 trips, 20 DAS, NYB closed	31,649,562	2,439	2,570	5.6
3 22DAS	3 trips 22 DAS, NYB closed	33,142,092	2,421	2,863	5.3
3 24DAS	3 trips 24 DAS, NYB closed	34,039,373	2,410	3,050	5.1
3.2	3 trips 26 DAS, NYB closed	36,043,375	2,385	3,503	4.7
4	Status Quo	33,686,634	2,368	3,617	4.2

Table 57 – Comparison of area swept (nm2) between each specification alternative in Framework 34, including sensitivities for 22 and 24 DAS options. Shading is used to emphasize comparisons between the action Alternatives 2.1 – 3.2.

Alternative			1	2.1	2 22DAS	2 24DAS	2.2	3.1	3 22DAS	3 24DAS	3.2	4
	Description	**Area Swept (nm^2)**	**3,546**	**2,519**	**2,810**	**3,119**	**3,448**	**2,570**	**2,863**	**3,050**	**3,503**	**3,617**
1	No Action	3,546	0	-1027	-736	-427	-98	-976	-683	-496	-43	71
2.1	3 trips, 20 DAS, NYB/HC closed	2,519	1027	0	291	600	929	51	344	531	984	1098
2 22DAS	3 trips 22 DAS, NYB/HC closed	2,810	736	-291	0	309	638	-240	53	240	693	807
2 24DAS	3 trips 24 DAS, NYB/HC closed	3,119	427	-600	-309	0	329	-549	-256	-69	384	498
2.2	3 trips 26 DAS, NYB/HC closed	3,448	98	-929	-638	-329	0	-878	-585	-398	55	169
3.1	3 trips, 20 DAS, NYB closed	2,570	976	-51	240	549	878	0	293	480	933	1047
3 22DAS	3 trips 22 DAS, NYB closed	2,863	683	-344	-53	256	585	-293	0	187	640	754
3 24DAS	3 trips 24 DAS, NYB closed	3,050	496	-531	-240	69	398	-480	-187	0	453	567
3.2	3 trips 26 DAS, NYB closed	3,503	43	-984	-693	-384	-55	-933	-640	-453	0	114
4	Status Quo	3,617	-71	-1098	-807	-498	-169	-1047	-754	-567	-114	0

Table 58 – Comparison of the relative difference in area swept (nm^2) between each specification alternative in Framework 34, including sensitivities for 22 and 24 DAS options. Shading is used to emphasize comparisons between the action Alternatives 2.1 – 3.2.

Alternative			1	2.1	2 22DAS	2 24DAS	2.2	3.1	3 22DAS	3 24DAS	3.2	4
	Description	**Area Swept (nm^2)**	**3,546**	**2,519**	**2,810**	**3,119**	**3,448**	**2,570**	**2,863**	**3,050**	**3,503**	**3,617**
1	No Action	3,546	0%	-29%	-21%	-12%	-3%	-28%	-19%	-14%	-1%	2%
2.1	3 trips, 20 DAS, NYB/HC closed	2,519	41%	0%	12%	24%	37%	2%	14%	21%	39%	44%
2 22DAS	3 trips 22 DAS, NYB/HC closed	2,810	26%	-10%	0%	11%	23%	-9%	2%	9%	25%	29%
2 24DAS	3 trips 24 DAS, NYB/HC closed	3,119	14%	-19%	-10%	0%	11%	-18%	-8%	-2%	12%	16%
2.2	3 trips 26 DAS, NYB/HC closed	3,448	3%	-27%	-19%	-10%	0%	-25%	-17%	-12%	2%	5%
3.1	3 trips, 20 DAS, NYB closed	2,570	38%	-2%	9%	21%	34%	0%	11%	19%	36%	41%
3 22DAS	3 trips 22 DAS, NYB closed	2,863	24%	-12%	-2%	9%	20%	-10%	0%	7%	22%	26%
3 24DAS	3 trips 24 DAS, NYB closed	3,050	16%	-17%	-8%	2%	13%	-16%	-6%	0%	15%	19%
3.2	3 trips 26 DAS, NYB closed	3,503	1%	-28%	-20%	-11%	-2%	-27%	-18%	-13%	0%	3%
4	Status Quo	3,617	-2%	-30%	-22%	-14%	-5%	-29%	-21%	-16%	-3%	0%

6.4.4 Action 4 – Access Area Trip Allocations to the LAGC IFQ Component

The LAGC IFQ fishery is allocated a fleet wide total number of access area trips that is based on the access area allocation that the limited access component receives through specification setting (Action 3). LAGC IFQ vessels can elect to fish their quota in available access areas, but are not required to take trips in access areas. 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.

Based on the specifications options described in Action 3 (Section 4.3), a total of 1,071 access area trips are expected to be allocated to the LAGC IFQ component in FY2022. Note that this total number of trips reflects the increased LAGC IFQ access area possession limit of 800 pounds per trip expected for FY2022. This action is considering how LAGC IFQ access area trips will be distributed; the distribution of LAGC IFQ access area trips associated with Alternative 2 and Alternative 3 is shown in Table 16. Allocating LAGC trips to access areas is not expected to change the overall amount of effort expected from this component of the fishery because the LAGC IFQ component is a quota-based fishery.

Alternative 1 (No Action) would use the default number of trips allocated in FW33 (571 total trips in MAAA with a 600-pound possession limit, starting on April 1). Alternative 1 would allocate fewer LAGC IFQ access area trips to the MAAA compared to recent years, and therefore, provides no incentive for effort to increase in the LAGC component of the fishery. This could provide some positive benefits to protected species, particularly sea turtles, by reducing effort and therefore the potential for interactions in an area where interactions are more commonly observed (i.e., Mid-Atlantic) relative to other parts of the resource (i.e., GB, GOM, and SNE). However, considering that fishing would still occur in some part of the resource at some level, the risk of an interaction with ESA-listed species of sea turtles and Atlantic sturgeon would exist, meaning the overall impact of Alternative 1 on protected resources (i.e., with ESA-listed species of sea turtles and Atlantic sturgeon) is expected to be slightly negative. Given that LAGC IFQ vessels can fish their quota in open areas or access areas, these measures are not necessarily an indication of the level of effort from this component of the fishery; however, there may be some benefit to ESA-listed species of sea turtle by reducing the opportunity for the LAGC IFQ component to fish in the MAAA due to the overlap between the scallop fishery and sea turtles in this region of the fishery. Therefore, considering that Alternative 1 allocates access area trips to the MAAA whereas as the Alternative 2 and Alternative 3 allocate zero MAAA trips, the impacts of Alternative 1 could be slightly negative compared to Alternative 2 and Alternative 3.

A total of 1,071 access area trips would be allocated to the LAGC component under Alternative 2 and Alternative 3, with the only difference between the two options being how Closed Area II trips are distributed. Under Alternative 2, all access area trips that would have been allocated to Closed Area II would instead be allocated to Closed Area I. Under Alternative 3, all access area trips that would have been allocated to Closed Area II would instead be allocated evenly between Closed Area I and the Nantucket Lightship South (Table 59).

Under Alternative 2 and Alternative 3, both the LA and LAGC fisheries have the same proportion of their allocations coming from open vs. access areas. Fishing effort and behavior is expected to be similar under both Alternative 2 and Alternative 3, except that under Alternative 2, 2/3^{rds} of LAGC IFQ trips could be taken in CAI, whereas 2/3^{rds} of LAGC IFQ trips could be taken in the NLS-South under Alternative 3. The distribution of trips under either alternative is not necessarily an indication of where effort will be directed. This is due to the nature of the LAGC fishery in that vessels may fish their quota in open areas or access areas but are not required to fish in access areas. Vessels will fish in areas with the highest catch rates so that trips are economically viable.

Unlike Alternative 1, Alternative 2 and Alternative 3 do not allocate any LAGC IFQ access area trips in the MAAA. This is because there is no FT LA allocation to the MAAA in FY2022, as some or all of the MAAA is reverted to open bottom under the specifications options considered in Action 3. Compared to current conditions, all alternatives represent a decrease in LAGC trips to the MAAA. This could have some slightly positive impacts to protected species, specifically species of hard-shelled sea turtles, which overlap with the scallop fishery in the

Mid-Atlantic region at a higher rate than other parts of the resource. It is possible that some LAGC IFQ fishing does occur in the former MAAA under Alternative 2 and Alternative 3 by vessels fishing open trips; however, notable levels of effort are not expected due to the low biomass and catch rates anticipated for this part of the resource in FY2022. Even under Alternative 1, which allocates default trips to the MAAA, it is likely that little to no LAGC IFQ effort would occur there due to the low levels of biomass and catch rates expected for FY2022. Under this scenario, even if MAAA trips are allocated under Alternative 1, it is possible that the level of effort by the LAGC IFQ in this part of the resource is similar between Alternative 1, Alternative 2, and Alternative 3, meaning the impacts to protected species could be negligible in comparison to one another.

Given the above analyses and acknowledging the difficulty in predicting the timing and amount of LAGC IFQ access area effort, the impacts of Alternative 1, Alternative 2, and Alternative 3 to protected species could range from slightly negative to slightly positive in comparison to one another.

Table 59 – The distribution of LAGC access area trips under Alternative 4.4.1 (No Action), Alternative 4.4.2, and Alternative 4.4.3.

LAGC AA trips based on Council pref. specification alternative in Section 4.3	Alt. 1 (No Action)	Alt. 2	Alt. 3
MAAA	571	0	0
NLS-S	0	357	714
CAI	0	714	357

6.4.5 Action 5 – Additional Measures to Reduce Fishery Impacts

There are two alternatives under consideration in Action 5 related to RSA compensation fishing in access areas. Alternative 1 would prohibit vessels from fishing RSA compensation in access areas. Alternative 2 would allow vessels to fish an RSA compensation trips in all available access areas, including Closed Area II (between June 1 and August 1 only), the NLS-South, Closed Area I, and the Northern Gulf of Maine management area (up to 25,000 pounds). Vessels would only be allowed to fish RSA compensation pounds in Closed Area II AA on a seasonal bases from June 1 to August 15). Only vessels receiving allocations of NGOM RSA compensation would be able to fish their awards in the NGOM management area.

In general, RSA compensation fishing is a small component of the overall fishery (i.e., less than 3% of the fishery-wide projected landings associated with the preferred specifications alternative) and is considered as part of the impact analysis in Section 6.3.3. Despite the low level of effort, landings, and area swept expected as a result of RSA compensation fishing, the overall impacts on ESA listed species of sea turtles and Atlantic sturgeon are expected to be slightly negative for both alternatives. Considering that RSA compensation fishing represents a minimal part of overall effort, time with gear deployed in the water, landings, and area swept relative to what is expected for the fishery as a whole, it is difficult to distinguish how impacts to protected species might differ between Alternative 1 and Alternative 2. Based on this, either alternative when compared to the other is expected to result in neutral impacts to protected species

6.4.5.1.1 Alternative 1 – No Action

Under Alternative 1, RSA compensation fishing would be restricted to the open area only (i.e. areas that can be fished under DAS management). Regardless of where fishing effort occurs, interactions with sea turtles and Atlantic sturgeon are possible as these species have the potential to occur in all resource areas of the scallop fishery; however, under Alternative 1, the potential for an interaction may be higher or lower depending on the level of overlap between ESA-listed species of sea turtles or Atlantic sturgeon and the region where RSA fishing is directed. Information on the location of observed or documented interactions between scallop fishing gear and

ESA listed species of sea turtles or Atlantic sturgeon can help to inform this (see Section 5.4.2). For instance, encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine and Georges Bank (Murray & Orphanides 2013a). Based on this, sea turtle distribution commonly overlaps with the sea scallop fishery, specifically in Mid-Atlantic waters, as evidenced by the number of sea turtle (specifically hard-shelled) interactions (see Section 5.4.2.1.2). In fact, estimated bycatch rates in trawl and dredge gear are higher in the Mid-Atlantic than in other waters in the affected environment (FSB 2015; 2016; 2017; 2018; Murray 2011; 2015a; c; Warden 2011a; c). Given this, if this alternative resulted in effort shifting from the Mid-Atlantic to Georges Bank, based on observed interactions between scallop fishing gear and ESA-listed species of sea turtles, effort would be shifting from an area with a higher sea turtle encounter rate to an area with a lower sea turtle encounter rate, which in turn, may result in a reduced risk of an interaction. However, because the SAMS model predicts that open area effort will be focused mostly on Georges Bank instead of the Mid-Atlantic, the harvest of RSA compensation pounds would be expected to be distributed similarly (i.e., mostly on Georges Bank) under Alternative 1. Given this, and the information provided in Section 6.4.3, specifically the low level of effort, landings, and area swept expected under RSA compensation fishing, new or elevated interaction risks to protected species (i.e., ESA listed species of sea turtles and Atlantic sturgeon) are not expected under No Action. Based on this, overall impacts of Alternative 1 on ESA-listed species of sea turtles and Atlantic sturgeon are expected to be slightly negative. Impacts of Alternative 1 on ESA listed species of sea turtles and Atlantic sturgeon are expected to be negligible relative to Alternative 2.

6.4.5.1.2 Alternative 2 – Allow RSA compensation fishing in the NLS-South, Closed Area II, and Closed Area I, with limited RSA compensation fishing in the NGOM Management Area

Alternative 2 may have slightly negative impacts on protected resources (i.e., ESA listed species of sea turtles and Atlantic sturgeon) because the risk of interaction exists at any level of scallop fishing. Considering that RSA compensation fishing would be allowed in all available access areas under Alternative 2, and acknowledging that open and access area catch rates are expected to be higher on Georges Bank, it is possible that RSA compensation fishing will be directed to parts of the resource away from the Mid-Atlantic region, where the risk of interactions between ESA-listed species of sea turtles and scallop gear are elevated. This behavior may reduce the risk of interactions with ESA-listed species of sea turtles or Atlantic sturgeon by potentially shifting effort away from an area with high sea turtle or Atlantic sturgeon encounter rates (i.e., Mid-Atlantic) to other areas with lower sea turtle or Atlantic sturgeon encounter rates (e.g., Georges Bank). Given this, and the information provided in Section 6.4.3, specifically the low level of effort, landings, and area swept expected under RSA compensation fishing, new or elevated interaction risks to protected species (i.e., ESA listed species of sea turtles and Atlantic sturgeon) are not expected under Alternative 2. For these reasons, the overall impacts of Alternative 2 on protected species are expected to be slightly negative, but are expected to be negligible relative to Alternative 1.

6.5 Impacts on Physical Environment and Essential Fish Habitat

6.5.1 Action 1 – Overfishing Limit and Acceptable Biological Catch

The alternatives under this action pertain to setting the Annual Biological Catch (ABC) and overfishing limit (OFL) for fishing years 2022 and 2023 (default). These values are recommended by the Council's Scientific and Statistical Committee and approved by the Council. The Alternative 2 FY 2022 and FY 2023 OFL and ABC values that were approved by the SSC and recommended to the Council are summarized in Table 4. The updated ABC estimate including discards is 30,305 mt for FY2022 and 27,606 mt for FY2023. The OFL values are correspondingly higher. The 2022 ABC is about 2,500 mt lower than the default/No Action 2022 ABC (Alternative 1, 32,872 mt).

Fishery impacts to EFH are only indirectly related to the OFL and ABC, and more closely reflect the specifications alternative selected, neither the No Action ABC (Alternative 1) nor the alternative ABC

(Alternative 2) are anticipated to have direct impacts on EFH. The OFL and ABC values set by the Council are much higher than the projected landings by the fishery. Therefore, realized impacts on EFH for this framework will largely reflect measures discussed in Section 4.3, and are only indirectly related to the ABC and OFL values. However, because the OFL and ABC values for No Action and Alternative 2 are relatively different from one another, with lower values under Alternative 2, Alternative 2 is expected to have indirect positive effects on EFH relative to Alternative 1.

6.5.2 Action 2 – Northern Gulf of Maine Management and TAL Setting

The alternatives in this action pertain to setting the TAC for the NGOM Management Area.

Alternative 1 would set the total NGOM TAC for FY2022 at 74,000 pounds and would maintain the closure of Stellwagen Bank (Map 1), as specified in the default measures for the NGOM through Framework 33. This alternative would not implement the changes to the NGOM management area made in Amendment 21, such as the updated allocation sharing arrangement that is described in Alternative 2.

Under Alternative 1, the overall NGOM TAC would be split between the LAGC and LA components, with 72,000 pounds available for directed fishing by the LAGC component at 200 pounds per day and 2,000 pounds available to be fished as research set-aside compensation by the limited access component (Table 6). The NGOM management area would remain open for each component of the fishery (i.e., LA and LAGC) until their respective shares of the NGOM TAC have projected to have been caught.

Alternative 2 would specify a NGOM TAL limit for FY2022 and FY2023 (default), including set-asides to support research, monitoring, and a directed LAGC fishery, and re-opens the Stellwagen Bank closure area. Three options under Alternative 2 have varying F values of 0.15 (Option 1), 0.18 (Option 2), and 0.2 (Option 3). All options set total allowable landings for all permit categories the management area. Since all TAL options are below 800,000 pounds, the NGOM TAL would be allocated as NGOM Set-Aside, which would support directed LAGC fishing at 200 pounds per day. Fishing year 2023 default measures would be set at 75% of the 2022 NGOM Set-Aside value (Table 7).

Alternatives and options are summarized below (also see Table 7):

- Alternative 1 (No Action): Overall TAC of 74,000 lbs (72,500 LAGC)
- Alternative 2 Option 1: F=0.15 in FY2021 would result in an overall TAL of 559,974 lbs (519,895 lbs NGOM Set-Aside)
- Alternative 2 Option 2: F=0.18 in FY2021 would result in an overall TAL of 661,387 lbs (621,307 lbs NGOM Set-Aside)
- Alternative 2 Option 3: F=0.20 in FY2021 would result in an overall TAL of 727,575 lbs (687,446 lbs NGOM Set-Aside)

Discussion of impacts to be completed.

6.5.1 Action 3 – Fishery Specifications and Rotational Management

To be completed.

Figure 20 - Habitat Efficiency

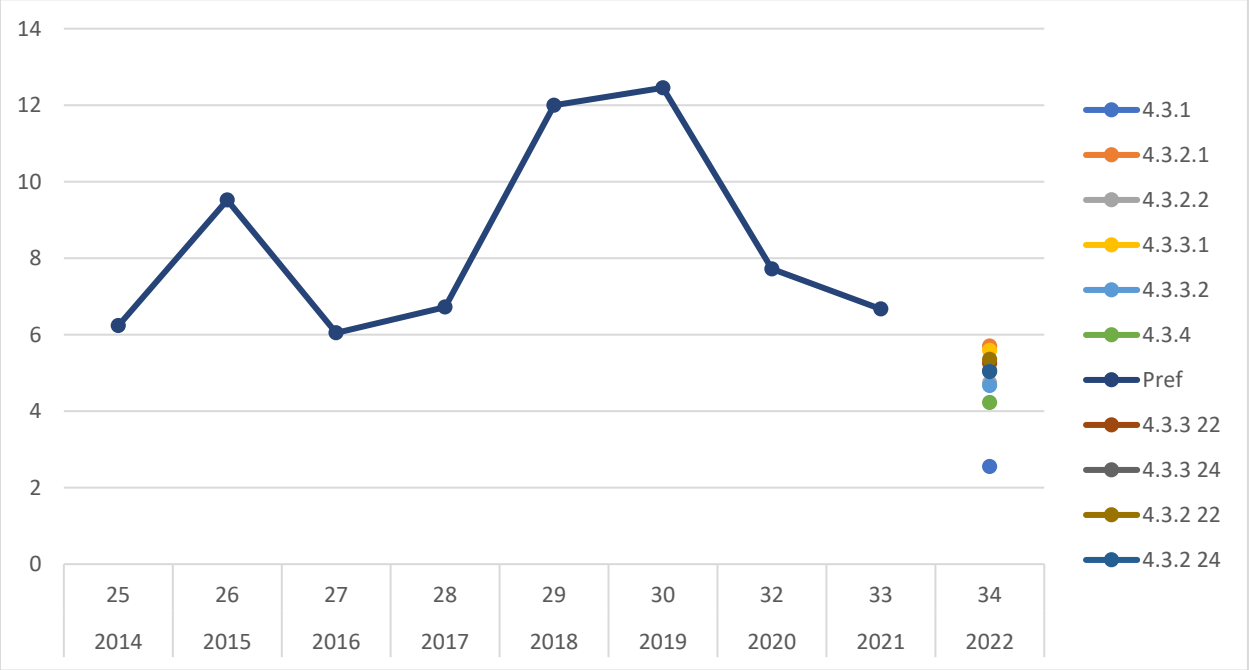
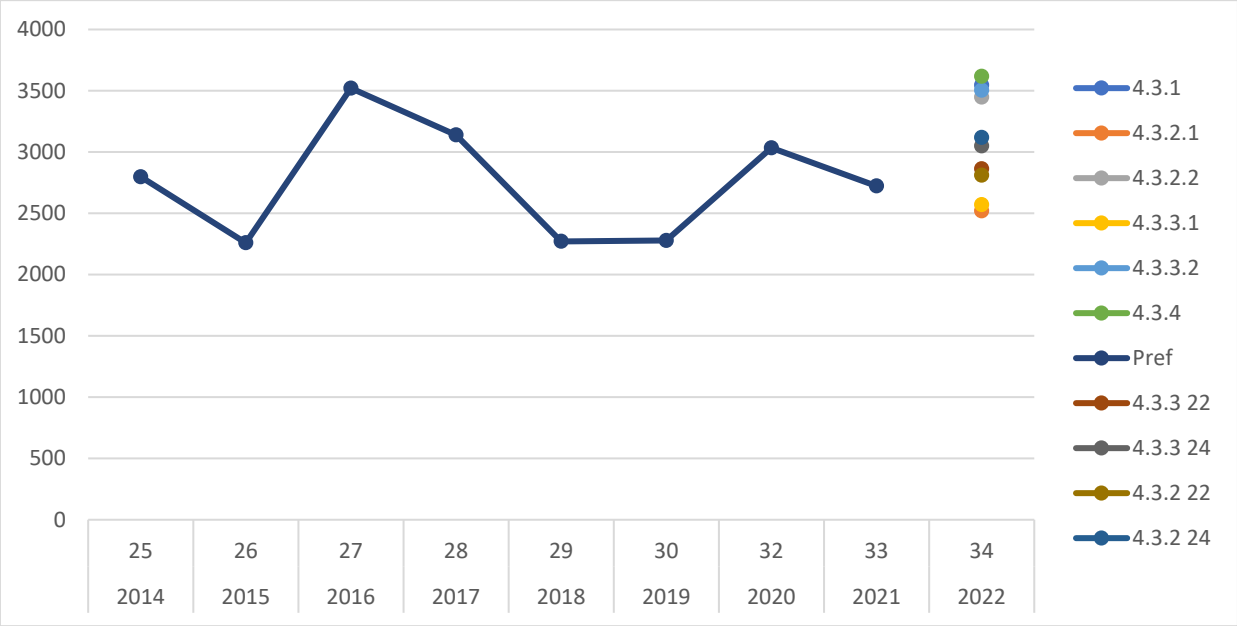


Figure 21 - Comparison of Bottom Area Swept



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

The LAGC IFQ fishery is allocated 5.5% of the access area allocations and 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. This action is considering three options for allocating fleet wide trips to the LAGC IFQ fishery and two options related to the maximum number of trips per area.

Alternative 1 (No Action) would use the default number of trips allocated in FW33 (571 trips to the MAAA and 571 trips to the NLS-South). Alternative 2 allocates 714 LAGC IFQ access areas trips to Closed Area I and 357 LAGC IFQ access area trips to the NLS-South. Alternative 3 allocates 357 LAGC access areas trips to Closed Area I and 714 LAGC IFQ access area trips to the NLS-South. Table 16 summarizes the three alternatives.

Since LAGC fishermen can choose whether to harvest their IFQ from access or open areas, options that afford greater flexibility to make this choice based on current fishery conditions are expected to have marginally lower impacts to EFH. This relies on the assumption that fishermen will opt to fish in areas that have more abundant or larger scallops whenever possible. Fishing more efficiently is expected to reduce gear/seabed contact and thus reduce impacts to EFH. Swept area estimates for access areas are generally lower than open areas, and LPUE in the open bottom is projected to be much lower than in recent fishing years. Thus, Alternatives 2 and 3 would likely have lower impacts to EFH as compared to Alternative 1. The difference in impacts of Alternative 2 versus Alternative 3 on EFH is likely to be negligible.

6.5.2 Action 5 – Additional Measures to Reduce Fishery Impacts

There are two alternatives are under consideration related to where RSA compensation fishing can occur. Alternative 1 would allow RSA compensation fishing in the open bottom but would prohibit vessels from fishing RSA compensation in access areas. Alternative 2 would allow vessels to fish RSA compensation trips in all access areas open to the fishery (NLS-South, Closed Area II, and Closed Area I), open bottom, and the Northern Gulf of Maine management area (up to 25,000 lb.). Note that the Hudson Canyon is only considered open bottom under certain alternatives under Action 3. Under Alternative 2, vessels would be able to fish in access areas which hold the majority of exploitable biomass and have higher projected LPUE compared to the open bottom. Closed Area II would be available for RSA compensation fishing only during the time of year when meat weights are at their highest (summer), which could limit how much effort is needed to achieve compensation trips in this area.

Overall impacts of either alternative are expected to be negligible since RSA compensation fishing is not a large proportion of landings (~4% of projected landings in FY2022). Adjusting the areas where RSA compensation trips can be fished is not likely to have a large influence on fishery impacts to EFH. Restrictions on RSA compensation fishing in the NGOM are to control mortality in the area and could be expected to have a slight positive impact on EFH in the NGOM.

Alternative 2 could be expected to have a slight positive impact on EFH relative to Alternative 1 since it would enable vessels to direct fishing effort to the access areas which have higher concentrations of animals

6.6 Impacts on Communities (Economic and Social Impacts)

The analysis of impacts on human communities characterizes the magnitude and extent of the economic and social impacts likely to result from the alternatives considered, individually and in relation to each other. Management regulations influence the direction and magnitude of economic and social change, but attribution is difficult, because communities are constantly evolving in response to many external factors (e.g., market conditions, technology, alternate uses of waterfront) that contribute to community vulnerability and adaptability to changing regulations.

Economic impacts. The economic effects of regulations can be categorized by changes in 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 as well as related industries (e.g., dealers, processors).

Social impacts. The social effects of regulations relate to changes factors such as demographics, employment fishery dependence, safety, attitudes towards management, equity, cultural values, and the well-being of persons, families, and fishing communities (e.g., Burdge 1998; NMFS 2007).

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; consumers; 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 fishery. Amendment 21 further describes approaches to the analysis of impacts on human communities.

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 considering 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) may have positive short-term impacts on fishing communities depending on how prices respond to changes in quantity supplied. Likewise, lowering allowable harvests (as contemplated in this action) 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 5.6.2. 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. Potential differential impacts across ports are noted in the analysis.

6.6.1 Economic Impacts

6.6.1.1 Action 1 – Overfishing Limit and Acceptable Biological Catch

To be competed.

6.6.1.2 Action 2 – Northern Gulf of Maine Management and TAL Setting

6.6.1.2.1 Alternative 1 – No Action

Under default measures for FY2022, the total NGOM TAC for FY2022 at 74,000 pounds and would maintain the closure of Stellwagen Bank, as specified in the default measures for the NGOM through Framework 33. This alternative would not implement the changes to the NGOM management area made in Amendment 21, such as the updated allocation sharing arrangement that is described in Alternative 2.

Estimated scallop revenue for the LAGC NGOM fleet would be about $0.93 million under this alternative using an estimated price of $12.86 per pound and assuming landings will be equivalent to 72,000 pounds. Fishing costs are estimated to be about $0.19 million and net revenue would be about $0.74 million for the LAGC NGOM fleet[12] (Table 60).

No Action (Alternative 1) will have negative economic impacts on the NGOM portion of the fishery compared to Alternative 2. This alternative would result in much lower revenues and net benefits relative to Alternative 2 Option 1, Alternative 2 Option 2, and Alternative 2 Option 3.

Table 60. NGOM TAC, Scallop revenue and costs under Alternative 1, No Action (Monetary values are in 2021 dollars)

Data and Values	**Estimated values for FY2022**
Overall TAC (lbs.)	74,000
LA (RSA) TAC	2,000
LAGC (NGOM) TAC	72,000
Economic Impacts on the LAGC (NGOM) share:	
• Estimated LAGC scallop revenue	$925,560
• DAS	360
• Trip costs ($528.90/DAS)	$190,404
• **Net revenue**	**$735,156**

6.6.1.2.2 Alternative 2 - Re-open Stellwagen Bank and set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery with TAL Setting based on A21

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY2022 and FY2023 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Catch limits for the NGOM under Alternative 2, including setting the NGOM TAL, and set-asides to support research, monitoring, and a directed LAGC fishery, reflect changes to management of the NGOM as a result of Amendment 21. Alternative 2 would also re-open the Stellwagen Bank closure area (see Map 1) to directed scallop fishing. The

All options of Alternative 2 would set total allowable landings for all permit categories the management area, which would be reduced by 25,000 pounds to increase the overall scallop RSA (Table 7). The total allowable landings would also be reduced by 1% of the NGOM ABC (15,080 pounds) to support monitoring the directed scallop fishery in the NGOM (Table 7). The pounds deducted from the NGOM TAL would be added to the fishery-wide set-asides for research and monitoring. At or below the 800,000 pounds trigger, the NGOM TAL would be allocated as NGOM Set-Aside, which would support directed LAGC fishing at 200 pounds per day. Over this value, the remaining NGOM TAL would be shared between the NGOM annual projected landings

[12] Scallop revenue and cost estimates are based on the following assumptions and data. The assumed price per pound of scallops, $12.86, is roughly equivalent to the average estimated price (in 2021 dollars based on recent fishery price data adjustment) for all market categories of scallops under the FW34 specification scenarios. This price is used for both alternatives in this action.

Trip costs estimates are based on cost function estimated using observer data for 1991-2020 and corresponds to estimated fuel, oil, water, food, ice, supply costs per trip for the NGOM fishery. Trip costs that were initially estimated in 2020 dollars were later adjusted by cost inflation to estimate costs in terms of 2021 dollars. Note that the observed trip costs in FY2021 increased by about 23 percent compared to the trip cost estimates in FY2020. Hence estimated trip cost for a NGOM vessel is about $529 per DAS. This cost inflation rate was taken into consideration while estimating the trip costs (in 2021 dollars) in FR34 economic analysis. Total DAS for the NGOM fleet was estimated by dividing TAC with the 200 lb. possession limit.

(APL) (i.e., allocated to the limited access and LAGC IFQ components) and additional allocation for the NGOM set-aside. None of the NGOM TAL options of Alternative 2 exceed the 800,000 trigger; therefore, the remaining TAL after pounds are deducted for research and monitoring are allocated as NGOM Set-Aside for directed LAGC fishing (Table 7).

Under Alternative 2, fishing year 2023 default measures would be set at 75% of the 2022 NGOM Set-Aside value (Table 7).

The NGOM Set-Aside for FY2022 under the options of Alternative 2 ranges from 519,895 pounds (Option 1) to 687,446 pounds (Option 3) (Table 61). The FY2023 default NGOM Set-Aside is set at 75% of the FY2022 NGOM Set-Aside; the default NGOM Set-Aside for FY2023 would be set at 389,921 pounds under Alternative 2 Option 1, 465,980 pounds under Alternative 2 Option 2, and 515,584 pounds under Alternative 2 Option 3 (Table 62). The economic impacts of the FY2022 NGOM Set-Aside under the options of Alternative 2 are shown in Table 61 and the economic impacts of the associated FY2023 default NGOM Set-Aside values are shown in Table 62.

Table 61. Economic Impacts of the FY2022 NGOM TAL under Alternative 2 Option 1 - 3 (monetary values are in 2021 dollars).

	Alternative 2		
	Option 1	**Option 2**	**Option 3**
	(F=0.15)	**(F=0.18)**	**(F=0.20)**
2022 Total Allowable Landings	559,974	661,387	727,525
1% NGOM ABC for Observers	15,080	15,080	15,080
2022 RSA Contribution	25,000	25,000	25,000
2022 NGOM Set-Aside	519,895	621,307	687,446
Impacts of the NGOM Set-Aside:			
Estimated LAGC revenue	$6,683,250	$7,986,901	$8,837,118
DAS	2,599	3,107	3,437
Trip costs ($528.90 per DAS)	$1,374,862	$1,643,046	$1,817,951
Net revenue	$5,308,388	$6,343,855	$7,019,167

Table 62. Economic impacts of the FY2023 (default) NGOM Set-Aside under Alternative 2 Option 1 -3 (values in 2021 dollars).

	Alternative 2		
	Option 1	**Option 2**	**Option 3**
FY2023 NGOM Set-Aside (default)	389,921	465,980	515,585
Impacts of the 2023 NGOM Set-Aside (default):			
Estimated Revenue	$5,012,434	$5,990,173	$6,627,832
DAS	1,950	2,330	2,578
Trip costs ($528.90 per DAS)	$1,031,146	$1,232,284	$1,363,462
Net revenue	$3,981,288	$4,757,889	$5,264,370

6.6.1.2.3 FY2022 & FY 2023 NGOM TAL

Table 61 and Table 62 summarize the economic impacts of Alternative 2 in FY2022 and FY2023 (default), respectively. Revenues and net revenues under all FY2022 options under Alternative 2 are much higher than estimated for Alternative 1 (No Action).

- Alternative 2, Option 1 would result in a higher NGOM Set-Aside (519,974 pounds) for the LAGC component compared to the LAGC share of the NGOM TAC under Alternative 1 (72,000 pounds) for the 2022 fishing year and is expected to have an estimated revenue of $6.68 million. Net revenue for Alternative 2 Option 1 would be around $5.31 million, which is about $4.57 million higher than No Action. Gross and net revenue estimates for the 2022 fishing year are calculated using a price estimate of $12.86 per pound (in 2021 dollars).
- Alternative 2 Option 2 yields higher net revenue estimated at $6.34 million in FY2022. The net benefit (net of No Action) for this sub-option is estimated to be $5.61 million higher than Alternative 1.
- Alternative 2 Option 3 yields the highest net revenue estimated at $7.02 million in FY2022. The net benefit (net of No Action) for this option is estimated to be $6.28 million higher than the Alternative 1.
- Comparing the three options of Alternative 2 for FY2022, Option 3 has the highest net revenues relative to other options.

Alternative 2 has substantially higher economic benefits in the short term due to higher levels of biomass on Stellwagen Bank and the measures being implemented through Amendment 21, including changes to the allocation structure to the LAGC component which results in higher catch limits compared to Alternative 1. In the longer term, sustaining higher NGOM Set-Asides and revenue will be directly related to the level of exploitable biomass in the NGOM in the future. The allocation sharing arrangement, requirement for observer coverage, and contributions to the research set-aside as a result of Amendment 21 are expected to reduce uncertainty around removals from the area, allow for a directed LAGC fishery, and improve the understanding of the resource in the NGOM through improved fishery data and research. These aspects of Amendment 21 that are being implemented through Alternative 2 of Action 2 are expected to result in positive economic benefits of the participants of the LAGC NGOM fishery.

6.6.1.3 Action 3 – Fishery Specifications and Rotational Management

The LA (94.5%) and LAGC IFQ (5.5%) allocations are based on Annual Projected Landings (APL). Table 63 provides a comparison of anticipated F rates, along with APL values for the LA and LAGC components.

Table 63 - Comparison of allocations and DAS associated with each specification alternative in FW34.

Alternatives in FW34	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	0.072	0.28	19,940,812	17,319,516	16,366,942	952,573
4.3.2.1	HCcl20	0.229	0.34	31,667,199	29,045,903	27,448,379	1,597,525
4.3.2.2	HCcl26	0.244	0.47	36,030,147	33,408,852	31,571,365	1,837,487
4.3.2_Sensitvt22	HCcl22	0.233	0.39	33,150,910	30,529,615	28,850,486	1,679,129
4.3.2_Sensitvt24	HCcl24	0.24	0.42	34,605,961	31,984,665	30,225,509	1,759,157
4.3.3.1	HCSop20	0.23	0.33	31,649,562	29,028,267	27,431,712	1,596,555
4.3.3.2	HCSop26	0.246	0.45	36,043,375	33,422,079	31,583,865	1,838,214
4.3.3_Sensitvt22	HCSop22	0.233	0.37	33,142,092	30,520,796	28,842,152	1,678,644
4.3.3_Sensitvt24	HCSop24	0.24	0.39	34,039,373	31,418,077	29,690,083	1,727,994
4.3.4*	Status Quo			33,686,634	31,065,338	29,356,744	1,708,594

* "Status Quo" refers to Framework 32 preferred measures and is provided in the alternatives section of Framework 33 to provide continuity and context for the reader, but is not an option proposed for Council decision.

6.6.1.3.1 Economic impacts of the proposed specification alternatives

Alternatives considered in Framework 34 are described in Section 4.3 for a full-time limited access vessel. No Action corresponds to the default measures in Framework 33 and Status Quo refers to a state with no changes from the present allocations in Framework 33 for open area DAS and access area trips using updated biological data from the 2021 surveys.

The short-term impacts in FY2022 and the long-term impacts over the 15- year period from FY2022-2036 are summarized below. Note that this section refers to a specification alternative or run.

Summary of economic impacts

Economic impacts in the Framework 34 fishery specifications are evaluated for both the short- and long-terms. Price and variable trip cost models that feed data up to FY2020 with economic variables in 2020 dollars estimates scallop prices and trip costs in 2020 dollars, but they are adjusted to 2021 dollars for the upcoming year's landing projections using economy wide inflation index. However, because of a very high price increases in 2021, the short-term economic impacts for FY2022 landings are evaluated using both low and high price scenarios to provide plausible economic impact ranges.[13] In the short-term, economic values for the FY2022 projected landings are adjusted to 2021 dollars based on the consumer price index (CPI) as well as recent fishery price data (GARFO's APSD database) for U10 and 11plus grades. The long-term economic impact estimates, however, are not based on fishery data. It is assumed that the recent price spikes and inflation may smooth out in the long run. Therefore, the long-term economic impacts are evaluated conservatively using scallop prices adjusted with CPI.[14]

Short-term (FY2022) impacts (Table 64 **and** Table 65**)[15]:**

- Total economic benefits (a sum of producer and consumer surpluses) under the alternatives (Section 4.3.2.2, Section 4.3.2_Sensitivity24, Section 4.3.3.2 and 4.3.3_Senisitivity24) are higher than SQ in FY2022 but lower in rest other alternatives.

- Total economic benefits (in 2021 dollars) are highest for the Section 4.3.3.2 ranging from $312 to $387 million, and lowest for the Section 4.3.2.1 ranging from about $274 million to $339 million in low and high price scenarios. Compared to the SQ, the total economic benefit in the highest-ranking Section 4.3.3.2 is low positive ranging from about $20 to $25 million in low and high price scenarios. Similarly,

[13] Right after Covid-19 pandemic, both scallop harvest and prices plummeted. Scallop prices remained at a lower level for most part of FY2020 but buoyed up significantly later in FY2020. Prices further increased and have remained high for all grades of scallops throughout FY2021 (as of November 2021). The price increase has surpassed well above the economy wide inflation index. As of October 2021, economy wide CPI increased by about 5.2 percent between FY2020 and midyear of FY2021. However, U10 grade price increased by about 86 percent and 11plus grade scallop price increased by about 16 percent for the same period. Overall, there was about 27% increase in the price of all scallops. At the same period, fuel price increased by about 33 percent and overall trip cost increased by about 23 percent.

[14] Note that the CPI based price adjustment provides reasonably conservative economic impact estimates, but the prices adjusted based on recent fishery data provides economic impact estimates on the higher end. The price estimates adjusted based on fishery data, however, may be a transitory or permanent price shift that depends on future economic or inflation situation.

[15] Note that range of estimates for different economic variables like revenues, producer surplus, consumer surplus and total economic benefits in the short-term economic impacts are based on low (CPI based price adjustment) and high (fishery data-based price adjustment) scallop prices in 2021 dollars for FY2022 landing projections in fishery specification management action. All economic numbers are in 2021 dollars in the short-term economic impacts.

the total economic benefits in the lowest-ranking Section 4.3.3.1 are lower by about $19 million to $23 million compared to the SQ levels under the low and high price scenarios.

- In the short run, the Section 4.3.3.2, which allocates 26 DAS for full-time limited access vessels in open areas, has the highest landings (36.04 million lbs.), revenues ($388 million to $460 million) and total economic benefits ($312 million to $387 million) in FY2022. Total revenues associated with this section (the economically highest-ranking specification alternative) are estimated to exceed the SQ revenue by about $21 million to $26 million.

- Except for No Action, revenue ranges from around $345 million (Section 4.3.2.1) to $360 million (Section 4.3.3.2) under the low-price scenario. Similarly, revenue ranges from about $409 million (Section 4.3.2.1) to $460 million (Section 4.3.3.2) under the high-price scenario.

- Compared to SQ, projected revenues are lower by $21.39 in Sections 4.3.2.1, by $21.43 million in Section 4.3.3.1, by $6.74 million in Section 4.3.3 (Sensitivity22), and by $6.86 million in Section 4.3.3 (Sensitivity22) under the low-price scenario. Similarly, projected revenues compared to SQ are lower by $25.06 million in Sections 4.3.2.1, by $25.34 million in Section 4.3.3.1, by $7.76 million in Section 4.3.3 (Sensitivity22), and by $7.65 million in Section 4.3.3 (Sensitivity22) under the high-price scenario. Revenues for rest other alternatives in Section 4.3.2.2, Section 4.3.3.2, and sections associated to Sensitivity 24 are all higher than SQ in both low and high price scenarios.

- It is important to note that actual prices, revenues, and total economic benefits may differ from these estimates. Actual prices will depend on realized landings, the size composition of landings, and values of variables that effect prices including import prices, disposable income of consumers and imports of scallops from countries such as Canada and Japan that are a close substitute for the large domestic scallops. When estimating prices, it was assumed that the values of these variables will not change from the current levels and that actual landings will equal to the projected landings from the biological model. For these reasons, the numbers provided in the tables should be mainly used to compare one alternative with another rather than to predict future values.

Table 64 - Economic Impacts for 2022 in Low Price Scenario*: Estimated landings (Mill.lb.), revenue and economic benefits (Mill. $, in 2021 dollars), and price (in 2021$ per lb.).

Values/ RUN	Unit	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt 22	4.3.2_Sensitvt 24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt 22	4.3.3_Sensitvt 24	SQ_4.3.4
Landings	mil lbs.	19.94	31.67	36.03	33.15	34.61	31.65	36.04	33.14	34.04	33.69
Price _all	$/lb	$11.25	$10.92	$10.77	$10.87	$10.82	$10.92	$10.77	$10.87	$10.84	$10.90
Revenue	mil dollar	$224.37	$345.67	$387.95	$360.20	$374.33	$345.63	$388.35	$360.32	$369.06	$367.06
Revenue Difference from SQ	mil dollar	-$142.69	-$21.39	$20.89	-$6.86	$7.27	-$21.43	$21.29	-$6.74	$2.00	$0.00
Producer Surplus (PS)	mil dollar	$157.35	$263.51	$298.42	$275.57	$287.25	$263.48	$298.81	$275.70	$282.94	$280.59
Consumer Surplus (CS)	mil dollar	$3.50	$10.01	$13.20	$11.05	$12.12	$10.00	$13.22	$11.05	$11.70	$11.49
Total Economic Benefits (PS+CS)	mil dollar	$160.85	$273.52	$311.62	$286.62	$299.36	$273.48	$312.03	$286.74	$294.64	$292.07
Total Benefits Difference from SQ	mil dollar	-$131.22	-$18.55	$19.55	-$5.45	$7.29	-$18.59	$19.96	-$5.33	$2.57	$0.00
Rank		9	7	2	6	3	8	1	5	4	

*Low-price is CPI based priced adjustment to 2021 dollars for the price model estimates.

Table 65 - Economic Impacts for 2022 in High Price Scenario: Estimated landings (Mill.lb.), revenue and economic benefits (Mill. $, in 2021 dollars), and price (in 2021$ per lb.).**

Values/ RUN	Unit	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
Landings	mil lbs.	19.94	31.67	36.03	33.15	34.61	31.65	36.04	33.14	34.04	33.69
Price _all	$/lb	$13.52	$12.93	$12.77	$12.88	$12.83	$12.93	$12.77	$12.88	$12.85	$12.90
Revenue	mil dollar	$269.63	$409.61	$460.18	$427.02	$443.91	$409.33	$460.40	$426.91	$437.37	$434.67
Revenue Difference from SQ	mil dollar	-$165.04	-$25.06	$25.51	-$7.65	$9.24	-$25.34	$25.73	-$7.76	$2.70	$0.00
Producer Surplus (PS)	mil dollar	$202.61	$327.45	$370.65	$342.39	$356.83	$327.17	$370.86	$342.29	$351.25	$348.20
Consumer Surplus (CS)	mil dollar	$4.21	$11.98	$15.85	$13.24	$14.53	$11.96	$15.86	$13.23	$14.02	$13.75
Total Economic Benefits (PS+CS)	mil dollar	$206.81	$339.42	$386.50	$355.63	$371.36	$339.13	$386.72	$355.52	$365.27	$361.94
Total Benefits Difference from SQ	mil dollar	-$155.13	-$22.52	$24.55	-$6.31	$9.42	-$22.81	$24.78	-$6.42	$3.32	$0.00
Rank		9	7	2	5	3	8	1	6	4	

**High-price is fishery data based priced adjustment to 2021 dollars for the price model estimates.

Long-term impacts (FY2022 to FY2036)

The long-term economic impacts are summarized in Table 66 (in Panel A and Panel B). Economic values are discounted to present value terms at a market rate of 7 percent. The economic estimates are in 2021 dollars with price adjustments based on CPI.

- In the long-term, cumulative scallop landings ranged between 819.62 million to 822.52 million pounds.

- Compared to SQ, the long-term present value of revenues, producer surplus and total economic benefits are higher for Section 4.3.3.2, but lower in rest other specification alternatives.
- The cumulative present value of the revenue is highest for the Section 4.3.3.2 at about $4,545 million (in 2021 dollars). With the exception of the No Action alternative, the cumulative present value of revenue ranged between $4,515 million (Section 4.3.2.1) and $4,545 million (Section 4.3.3.2).
- With the exception of the No Action alternative, the cumulative present value of producer surplus ranged between $4,238 million (Section 4.3.2.1) and $4,253 million (Section 4.3.3.2).

- The differences in total economic benefit from SQ range between -$15.2 million (Section 4.3.2.1) and $0.07 million (Section 4.3.3.2).

- The ranking of alternatives between short- and long-term impacts for the top ranked specification alternative is identical, but they differ for other alternatives. In terms of the long-term revenue ranking, the Section 6.6.1.3.1 ranks 1st both in the short-term and long-term.

- Higher revenues and economic benefits are expected from specifications alternatives with the higher open area DAS for the FT LA vessels. The increase in revenues and economic benefits can be attributed to higher DAS from 20-24 to 26 DAS in open areas. The long-term differences in cumulative present value of revenue between 22- and 24-days sensitivity options is only $2 million or negligible for both Sections 4.3.2 and 4.3.3.

Table 66. Long-term (FY2022-FY2036) economic impacts discounted at 7% (in 2021 dollars (Panel A: CPI based, and Panel B: Fishery Data based price adjustment to 2020 dollars)) (Million dollars).

Panel A:

FW34 - Long-term Economic Impacts (2022-2036) with Low Prices (CPI based price adj in 2021 dollars): Cumulative present value of revenues, producer surplus and total economic benefits net of Status quo values (million $ in 2021 dollars, 7% Discount rate)

Economic Variables	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
Landings mil lbs	819.620	821.371	821.558	821.461	821.523	822.290	822.524	822.398	822.456	822.502
Price _all	10.15	10.14	10.13	10.13	10.13	10.14	10.13	10.13	10.13	10.14
Revenue	5,251.84	5,272.72	5,281.37	5,276.08	5,278.99	5,283.40	5,292.85	5,287.01	5,289.06	5,291.47
Revenue Difference from SQ	**(39.63)**	**(18.75)**	**(10.11)**	**(15.39)**	**(12.48)**	**(8.08)**	**1.37**	**(4.46)**	**(2.41)**	**-**
Producer Surplus	4,217.48	4,238.22	4,243.74	4,240.53	4,242.40	4,246.80	4,253.08	4,249.34	4,250.74	4,252.50
Consumer Surplus	297.24	291.87	291.13	291.59	291.34	292.93	292.19	292.65	292.51	292.71
Total Benefits	4,514.72	4,530.09	4,534.86	4,532.11	4,533.74	4,539.73	4,545.27	4,541.99	4,543.25	4,545.21
Total Benefits Difference from SQ	**(30.49)**	**(15.12)**	**(10.34)**	**(13.09)**	**(11.46)**	**(5.47)**	**0.07**	**(3.22)**	**(1.96)**	**-**
Total Benefit Rank	**9**	**8**	**5**	**7**	**6**	4	1	3	2	

Panel B:

FW34 - Long-term Economic Impacts (2022-2036) with High Prices (Fishery data based price adj in 2021 dollars): Cumulative present value of revenues, producer surplus and total economic benefits net of Status quo values (million $ in 2021 dollars, 7% Discount rate)

Economic Variables	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
Landings mil lbs	819.620	821.371	821.558	821.461	821.523	822.290	822.524	822.398	822.456	822.502
Price _all	11.76	11.72	11.71	11.71	11.71	11.71	11.71	11.71	11.71	11.71
Revenue	6,084.27	6,096.68	6,106.96	6,100.71	6,104.16	6,108.61	6,119.89	6,112.94	6,115.40	6,119.07
Revenue Difference from SQ	**(34.80)**	**(22.39)**	**(12.12)**	**(18.36)**	**(14.91)**	**(10.46)**	**0.82**	**(6.13)**	**(3.67)**	**-**
Producer Surplus	5,049.91	5,062.18	5,069.33	5,065.16	5,067.57	5,072.02	5,080.12	5,075.26	5,077.09	5,080.10
Consumer Surplus	348.00	340.76	339.90	340.44	340.15	342.04	341.18	341.71	341.55	341.85
Total Benefits	5,397.92	5,402.95	5,409.23	5,405.60	5,407.72	5,414.06	5,421.31	5,416.98	5,418.63	5,421.94
Total Benefits Difference from SQ	**(24.03)**	**(19.00)**	**(12.71)**	**(16.35)**	**(14.22)**	**(7.88)**	**(0.64)**	**(4.97)**	**(3.31)**	**-**
Total Benefit Rank	**9**	**8**	**5**	**7**	**6**	4	1	3	2	

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

6.6.1.3.2 LAGC IFQ allocations

LAGC IFQ fishery is allocated 5.5% of the annual projected landings (APL), those with IFQ permits receiving 5% and those with both IFQ and LA permits receiving 0.5% of the total APL.

Table 67 - Economic Impacts (Low Price Scenario) of the LAGC IFQ TAC for the 2022 fishing year.

Runs/Alts	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
LAGC IFQ Share (pounds)	952,573	1,597,525	1,837,487	1,679,129	1,759,157	1,596,555	1,838,214	1,678,644	1,727,994	1,708,594
LAGC IFQ Share (mt)	432	725	834	762	798	724	834	762	784	775
Price per lb. (in 2021$ CPI adj)	$11.25	$10.92	$10.77	$10.87	$10.82	$10.92	$10.77	$10.87	$10.84	$10.90
Revenue (2021 $)	$10,717,734	$17,437,839	$19,784,649	$18,243,944	$19,028,054	$17,435,072	$19,805,270	$18,249,720	$18,734,756	$18,616,936
Revenue Difference from SQ (mil $)	-$7.90	-$1.18	$1.17	-$0.37	$0.41	-$1.18	$1.19	-$0.37	$0.12	$0.00
Percent Change in Revenue from SQ	-42.43%	-6.33%	6.27%	-2.00%	2.21%	-6.35%	6.38%	-1.97%	0.63%	0.00%

Table 68 - Economic Impacts (High Price Scenario) of the LAGC IFQ TAC for the 2022 fishing year.

Runs/Alts	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
LAGC IFQ Share (pounds)	952,573	1,597,525	1,837,487	1,679,129	1,759,157	1,596,555	1,838,214	1,678,644	1,727,994	1,708,594
LAGC IFQ Share (mt)	432	725	834	762	798	724	834	762	784	775
Price per lb. (in 2021$ Fish Data based adj)	$13.52	$12.93	$12.77	$12.88	$12.83	$12.93	$12.77	$12.88	$12.85	$12.90
Revenue (2021 $)	$12,880,067	$20,663,831	$23,468,643	$21,628,868	$22,565,819	$20,648,680	$23,480,519	$21,623,222	$22,203,067	$22,046,615
Revenue Difference from SQ (mil $)	-$9.17	-$1.38	$1.42	-$0.42	$0.52	-$1.40	$1.43	-$0.42	$0.16	$0.00
Percent Change in Revenue from SQ	-41.58%	-6.27%	6.45%	-1.89%	2.36%	-6.34%	6.50%	-1.92%	0.71%	0.00%

Table 67 and Table 68 show the LAGC IFQ share (5.5% of APL) and estimated revenues for all specification alternatives including SQ and NA options. LAGC IFQ share for the SQ alternative is 1,708,594 pounds. The share for the specification alternatives ranges from 1,597,525 pounds (Section 4.3.2.1) to a high of 1,838,214 pounds (Section 4.3.2.2). Alternative Section 4.3.4 is the Status Quo scenario for comparison purposes of the relative economic benefits. Under this scenario, allocations for the LAGC IFQ fishery would be set using the regulations and spatial management from FW33, which would result in 1,708,594. Alternative Section 4.3.3.2 has the highest LAGC IFQ allocation, at 1,838,214 pounds with an expected revenue of $23.48 million (in 2021 dollars). The differences in revenue with SQ across alternatives range from about -$1.38 million to $01.43 million. The highest-ranking option in terms of revenue is Section 4.3.3.2 with 6.5% more revenue than what is expected for the LAGC IFQ allocation under Status Quo.

6.6.1.3.3 Landings and size composition

- Projected landings under all specification alternatives (except for No Action) range from roughly 31.67 million to 36.04 million pounds in FY 2022. While projections suggest that landings could reach close to 56 million pounds in FY 2024 to FY2026 (Table 69), the Council plans to revisit its rotational management strategy again next year using different assumptions. However, over the long-term (FY2027 to FY2036), the projected landings for each specification alternative (including No Action) are expected to stabilize around 58 million pounds.
- The short- and long-term projected landings of U10s are shown in Table 70 and Table 72. Under the specification alternatives being considered in this action (except for No Action), the proportion of overall landings that are U10s is estimated to be about 9 percent in FY2022 and is expected to stabilize around 4 to 6% in the long-term (FY 2026 to FY 2036). The share of U10 landing is expected to fall significantly from Framework 33, when U10s were projected to compose about 16% of the APL.

Table 69. Estimated landings (Million lbs., Average per fishing year).

Average of Total landings	FW34 Scenarios									
Fishing year groups	**4.3.1_NA**	**4.3.2.1**	**4.3.2.2**	**4.3.2_Sensitvt22**	**4.3.2_Sensitvt24**	**4.3.3.1**	**4.3.3.2**	**4.3.3_Sensitvt22**	**4.3.3_Sensitvt24**	**SQ_4.3.4**
2022	19.94	31.67	36.03	33.15	34.61	31.65	36.04	33.14	34.04	33.69
2023	54.83	45.04	43.32	44.46	43.88	46.26	44.55	45.69	45.34	45.99
2024-26	57.14	55.91	55.26	55.70	55.48	56.14	55.49	55.93	55.80	55.75
2027-36	57.34	57.69	57.64	57.68	57.66	57.59	57.54	57.58	57.57	57.56

Table 70. Projected landings of U10 scallops per year (million lbs).

Average of L-U10	Scenarios									
Fishing year groups	**4.3.1_NA**	**4.3.2.1**	**4.3.2.2**	**4.3.2_Sensitvt22**	**4.3.2_Sensitvt24**	**4.3.3.1**	**4.3.3.2**	**4.3.3_Sensitvt22**	**4.3.3_Sensitvt24**	**SQ_4.3.4**
2022	2.14	2.76	3.20	2.92	3.06	2.74	3.18	2.89	2.98	2.93
2023	4.68	3.92	3.71	3.85	3.78	3.95	3.74	3.88	3.84	4.01
2024-26	3.55	3.14	3.08	3.12	3.10	3.15	3.09	3.13	3.12	3.13
2027-36	2.70	2.67	2.66	2.66	2.66	2.67	2.66	2.66	2.66	2.66

Table 71. Historical landings of scallops by size category (in pounds).

Fishyear	'U10'_landing	'1120'_landing	'2130'_landing	31+ landing	'UNK'_landing	Grand 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	10,856,965	41,365,184	6,930,184	65,768	880,567	60,098,667
2019	11,944,335	38,171,190	8,154,785	1,061,243	1,053,266	60,384,819
2020	7,680,431	26,585,538	7,013,746	3,967,575	714,734	45,962,024

Table 72. Biological projections - Percentage share of U10 scallops in total landings.

Average of U10PCTSH	FW34 Scenarios									
Fishing year groups	**4.3.1_NA**	**4.3.2.1**	**4.3.2.2**	**4.3.2_Sensitvt22**	**4.3.2_Sensitvt24**	**4.3.3.1**	**4.3.3.2**	**4.3.3_Sensitvt22**	**4.3.3_Sensitvt24**	**SQ_4.3.4**
2022	10.72%	8.73%	8.88%	8.80%	8.85%	8.65%	8.81%	8.72%	8.76%	8.68%
2023	8.54%	8.71%	8.56%	8.66%	8.61%	8.54%	8.39%	8.49%	8.46%	8.72%
2024-26	6.22%	5.66%	5.63%	5.65%	5.64%	5.64%	5.61%	5.63%	5.62%	5.64%
2027-36	4.70%	4.62%	4.62%	4.62%	4.62%	4.63%	4.62%	4.63%	4.63%	4.62%

Table 73. Historical data: Percentage composition of scallop landings by size categories.

Fishyear	'U10'_landing	'1120'_landing	'2130'_landing	31+ landing	'UNK'_landing
2009	14.55%	61.81%	21.05%	0.30%	2.29%
2010	15.48%	63.63%	19.12%	0.11%	1.66%
2011	14.55%	77.10%	5.55%	0.52%	2.28%
2012	18.44%	73.14%	6.13%	0.11%	2.17%
2013	21.55%	61.62%	13.84%	0.31%	2.68%
2014	24.86%	58.96%	12.60%	0.88%	2.70%
2015	17.03%	58.85%	21.49%	0.47%	2.15%
2016	11.37%	45.21%	35.38%	5.30%	2.75%
2017	19.00%	54.84%	23.61%	0.73%	1.83%
2018	18.07%	68.83%	11.53%	0.11%	1.47%
2019	19.78%	63.21%	13.50%	1.76%	1.74%
2020	16.71%	57.84%	15.26%	8.63%	1.56%

Table 74. Scallop landings pounds per DAS (LPUE).

Average of LPUE-all		**FW34 Scenarios**									
Fishing year groups	**Scenum**	**4.3.1_NA**	**4.3.2.1**	**4.3.2.2**	**4.3.2_Sensitvt22**	**4.3.2_Sensitvt24**	**4.3.3.1**	**4.3.3.2**	**4.3.3_Sensitvt22**	**4.3.3_Sensitvt24**	**SQ_4.3.4**
2022	2022	2,322	2,440	2,384	2,422	2,403	2,439	2,385	2,421	2,410	2,368
2023	2023	2,529	2,497	2,481	2,491	2,486	2,494	2,478	2,488	2,485	2,501
2024-26		2,658	2,674	2,672	2,673	2,672	2,670	2,668	2,670	2,669	2,668
2027-36		2,729	2,732	2,732	2,732	2,732	2,731	2,731	2,731	2,731	2,731

6.6.1.3.4 Prices and Revenue

- Prices are estimated (Table 75) using the ex-vessel price model that takes into account the impacts of changes in domestic landings, exports, import prices, income of consumers, composition of landings by market category (i.e., size of scallops), and changes in international markets for large scallops using imports of Japanese and Canadian scallops as proxy variables (Economic Appendix I on Price Model).

- The price estimates in Framework 34 correspond to the price model outputs assuming that the import prices will be constant at their recent two year average value (i.e., import price for FY2019 and FY2020 averaged to about $5.51 per pound); scallop exports will constitute about 15% of the domestic landings;

per capita disposable income of about $55 thousands in FY2020 and is adjusted for in price estimation; the ratio of Japanese and Canadian imports to total scallops imported will be constant at their current levels in 2020; and only the effects of the reduction in and changes in the size composition of landings could be identified. In addition, price estimates reflect real (as opposed to nominal) prices since they are expressed in 2020 constant prices assuming inflation will be zero in future years. Therefore, actual, real, or nominal prices could be higher (lower) than the estimated prices depending on the import prices, exports, and(or) disposable income increased (decreased) in future years. Nominal prices will probably be higher in the future as well since it is unusual for the inflation to remain at zero. In addition, ex-vessel prices could be underestimates of true values because the biological model underestimates the proportion of U10s in landings and it does not have a separate category for U12 scallops which also receive a premium price.

- Although the absolute values for revenues, producer and consumer surpluses, and total economic benefits would change with the value of estimated prices, the differences of these values for all the alternatives to the No Action or Status Quo scenarios would not change in any substantial way. Higher realized prices would increase the short-term positive impact of all alternatives on revenues compared to No Action and SQ, while lower realized prices would reduce this impact. Increase in import prices leads to higher ex-vessel prices and revenues.

In short, absolute values of short- and long-term revenues (Table 64, Table 65, Table 75, and Table 76) and economic benefits will be greater with higher prices and smaller with lower prices, but the ranking of alternatives are not expected to change.

Table 75. Short-term Ex-Vessel Scallop Price Estimates for FY2022 (in 2020 and 2021 dollars) by Market Grades.

Price US$/lb.	*Prices in	Fish Year	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2 Sensitvt22	4.3.2 Sensitvt24	4.3.3.1	4.3.3.2	4.3.3 Sensitvt22	4.3.3 Sensitvt24	SQ_4.3.4
Price U10	2020$	2022	14.85	14.71	14.46	14.62	14.54	14.72	14.48	14.64	14.59	14.62
	2021$ (Adj to CPI)	2022	15.62	15.47	15.22	15.38	15.30	15.49	15.23	15.40	15.34	15.38
	2021$ (Adj based on Fishery Data)	2022	27.62	27.36	26.90	27.19	27.04	27.39	26.93	27.23	27.13	27.19
11 plus	2020$	2022	10.49	10.19	10.08	10.15	10.12	10.19	10.08	10.15	10.13	10.14
	2021$ (Adj to CPI)	2022	11.04	10.72	10.61	10.68	10.64	10.71	10.60	10.68	10.65	10.66
	2021$ (Adj based on Fishery Data)	2022	12.17	11.82	11.69	11.77	11.73	11.81	11.69	11.77	11.75	11.76
Price All	2020$	2022	10.70	10.38	10.24	10.33	10.28	10.38	10.24	10.33	10.31	10.36
	2021$ (Adj to CPI)	2022	11.25	10.92	10.77	10.87	10.82	10.92	10.77	10.87	10.84	10.90
	2021$ (Adj based on Fishery Data)	2022	13.52	12.93	12.77	12.88	12.83	12.93	12.77	12.88	12.85	12.90

*Price model estimates are in 2020 dollars. The price estimates are adjusted to 2021 dollars based on CPI and fishery data inflations between 2020 and 2021.

Table 76. Scallop revenue per fishing year (undiscounted, Million dollars, in 2021 dollars (based on prices adj to fishery data).

Average of REV-21	Scenarios									
Fishing year groups	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
2022	$269.63	$409.61	$460.18	$427.02	$443.91	$409.33	$460.40	$426.91	$437.37	$434.67
2023	$671.25	$564.73	$544.28	$557.87	$551.02	$577.48	$557.32	$570.75	$566.61	$575.34
2024-26	$674.19	$656.70	$649.63	$654.37	$652.00	$659.10	$652.11	$656.77	$655.37	$655.01
2027-36	$660.48	$663.39	$662.86	$663.21	$663.05	$662.46	$661.94	$662.29	$662.19	$662.05

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

Total effort in terms of DAS (Table 77, Table 78) will be higher in the short-term in FY 2022 for alternatives Section 4.3.3.2, Section 4.3.2.2, and section 4.3.2 (sensitivity 24) compared to the SQ scenario. Total DAS per FT vessel would be lower for rest other alternatives. Changes in the employment level in the scallop fishery, as measured by CREW*DAS, will be proportional to total effort under all alternatives compared to No Action and SQ. Because overall annual DAS per FT vessel will increase for Section 4.3.3.2, Section 4.3.2.2, and section 4.3.2 (sensitivity 24) compared to the levels under SQ conditions in 2022, employment is also expected to increase. For other alternatives, employment is expected to decrease.

- Fleet-wide trip costs in FY2022 (Table 79) for few alternatives (Section 4.3.3.2, Section 4.3.2.2, and 4.3.2_Sensitivity24) are expected to be slightly higher than SQ levels dollars as a result of slightly higher Total DAS, but there are small differences in the magnitude of trip costs across specification alternatives. However, trip costs are expected to increase slightly over the long-term. Trip cost per DAS in FY2022 is expected to increase by about 23% primarily attributed to increasing fuel costs and general inflation recently.

Table 77. Projected DAS per FT vessel per year (including open and access areas).

Average of DAS/LA vessel	FW34 Scenarios									
Fishing year groups	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
2022	24.08	36.37	42.36	38.37	40.37	36.37	42.36	38.37	39.59	39.87
2023	60.76	50.56	48.94	50.03	49.48	52.00	50.39	51.47	51.14	51.55
2024-26	60.26	58.59	57.95	58.38	58.16	58.92	58.28	58.70	58.57	58.54
2027-36	58.91	59.19	59.14	59.17	59.16	59.11	59.07	59.10	59.09	59.08

Table 78. Percentage change in total DAS from SQ levels (open and access areas).

Average of DAS/LA vessel	Percent change from SQ on Avg of DAS/LA vessel in tth year or period.									
Fishing year groups	4.3.1_NA	4.3.2.1	4.3.2.2	4.3.2_Sensitvt22	4.3.2_Sensitvt24	4.3.3.1	4.3.3.2	4.3.3_Sensitvt22	4.3.3_Sensitvt24	SQ_4.3.4
2022	-39.62%	-8.77%	6.24%	-3.77%	1.24%	-8.79%	6.24%	-3.77%	-0.71%	0.00%
2023	17.86%	-1.91%	-5.06%	-2.95%	-4.02%	0.86%	-2.25%	-0.16%	-0.80%	0.00%
2024-26	2.94%	0.08%	-1.02%	-0.28%	-0.65%	0.63%	-0.46%	0.27%	0.05%	0.00%
2027-36	-0.30%	0.18%	0.10%	0.16%	0.13%	0.06%	-0.02%	0.03%	0.02%	0.00%

Table 79. Trip costs per year for the scallop fleet (Undiscounted, in million 2021 dollars).

Average Trip Cost	FW34 Scenarios									
Fishing year groups	**4.3.1_NA**	**4.3.2.1**	**4.3.2.2**	**4.3.2_Sensitvt22**	**4.3.2_Sensitvt24**	**4.3.3.1**	**4.3.3.2**	**4.3.3_Sensitvt22**	**4.3.3_Sensitvt24**	**SQ_4.3.4**
2022	17.84	26.96	31.39	28.44	29.91	26.95	31.39	28.44	29.34	29.55
2023	45.03	37.47	36.27	37.08	36.67	38.53	37.34	38.14	37.90	38.20
2024-26	44.66	43.42	42.94	43.26	43.10	43.66	43.19	43.50	43.41	43.39
2027-36	43.65	43.86	43.83	43.85	43.84	43.81	43.77	43.80	43.79	43.78

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

- **Producer surplus (benefits)** for a fishery shows the net benefits to harvesters, including vessel owners and crew, and is measured by the difference between total revenue and costs including operating costs and opportunity costs of labor and capital. In technical terms, the producer surplus (PS) is defined as the area above the supply curve and the below the price line of the corresponding firm and industry (Just, Hueth & Schmitz (JHS)-1982). The supply curve in the short-run coincides with the short-run marginal cost above the minimum average variable cost. This area between price and the supply curve can then be approximated by various methods depending on the shapes of the marginal and average variable cost curves.

- Only alternatives Section 4.3.2.2, Section 4.3.2.2_Sensitivity24, Section 4.3.3.2, and Section 4.3.3.2_Sensitivity24 developed by the Council in Framework 34 have higher producer surplus relative to the SQ alternative in the short-term. It is lower for rest other alternatives. The decrease in producer surplus is largely attributed to decline in scallop landings together with the decline in share of U10 scallops and increase in trip costs. An increase in scallop prices could partially offset any decline in revenues due to reduced landing expectations.

- In FY2022, producer surplus (Table 64 and Table 65) is estimated to range between $327 million (Section 4.3.2.1) to $371 million (Section 4.3.3.2).

- The economic analysis presented in this section used the most straightforward approximation of producer surplus, which was defined as the excess of total revenue (TR) over the total variable costs (TVC) minus the opportunity costs of labor and capital. The fixed costs were not deducted from the producer surplus since the producer surplus is equal to profits plus the rent to the fixed inputs. More information about the producer surplus estimates and opportunity costs are provided in the Appendix for the Economic Model.

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

Consumer surplus for a fishery is the net benefit that consumers gain from consuming fish based on the price they would be willing to pay for them. Consumer surplus will increase when fish prices decline, and/or when the volume of fish harvested goes up. Present value of the consumer surplus (using a 7% discount rate), and the cumulative present values net of Status Quo levels are summarized in Table 66.

- Only alternatives Section 4.3.2.2, Section 4.3.2.2_Sensitivity24, Section 4.3.3.2, and Section 4.3.3.2_Sensitivity24 developed by the Council in Framework 34 have higher consumer surplus relative to the SQ alternative in the short-term. However, consumer surplus for rest other alternatives is lower relative to SQ.
- In FY2022, consumer surplus range between approximately $12 million (Section 4.3.2.1) to $16 million (Section 4.3.3.2).

Economic benefits include the benefits both to the consumers and to the fishing industry and are equal the sum of benefits to the consumers and producers. The cumulative present value of the total benefits and economic benefits net of Status Quo (SQ) levels are shown in Table 66.

- The cumulative present value of economic benefits is also estimated at a 7% discount rate. Total economic benefits for all specification alternatives are lower relative to the SQ. Discounting future benefits at a lower level resulted in higher benefits for all options without changing the ranking of the alternatives in terms of magnitude of benefits.

- Total economic benefits would be largest under Alternative Section 4.3.3.2 and lowest under the specification alternative in Section 4.3.2.1.
- Compared to SQ, total economic benefits in the short-term (FY2022) are higher in alternatives Section 4.3.2.2, Section 4.3.2.2_Sensitivity24, Section 4.3.3.2, and Section 4.3.3.2_Sensitivity24. Rest other all alternatives have lower total economic benefits compared to SQ.
- Total economic benefits range between $339 million (Section 4.3.2.1) to $387 million (Section 4.3.3.2).
- The short-term impact on total economic benefit for increasing open areas DAS from 24 to 26 DAS is estimated to be about $16 to $21 million.
- The long-term economic impacts (FY2022-2036) under the low and high price scenarios are presented in Table 66. In the long-term, Section 4.3.3.2 ranks highest and Section 4.3.2.1 ranks lowest in total economic benefits in both price scenarios.

6.6.1.4 Action 4 - Access Area Trip Allocations To The LAGC IFQ Component

6.6.1.4.1 Alternative 1 – No Action (Default Measures from FW33)

Alternative 1 could have negative economic impacts on LAGC IFQ vessels compared to Alternative 2 and Alternative 3. Alternative 1 would set LAGC IFQ access area trips at 571 trips to the Mid-Atlantic Access Area, which is the number of trips specified through default measures in Framework 33. Under No Action only a small percentage of the LAGC IFQ catch could come from access areas, with the rest coming from open areas. 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 and higher LPUE. 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.

6.6.1.4.2 Alternative 2 - Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation to Closed Area I Only

Alternative 2 could have positive economic impacts on LAGC IFQ vessels overall, and compared to Alternative 1. While the allocation of access area trips to the LAGC IFQ component is viewed as a positive, this alternative in FW34 would allocate 1,071 LAGC IFQ trips, which is 1,212 total trips less than the FY2021 allocation. This reduction was expected in part because of the increased trip limit recommended in Amendment 21. The preferred option in FW34 would not have any LAGC IFQ AA trips to the MAAA in 2022.

Alternative 2 could be expected to have slightly positive impacts relative to Alternative 3. Under Alternative 2, the LAGC IFQ component would have twice as many trips to CAI compared to Alternative 3. Alternative 2 would provide more opportunities to fish in access areas compared to Alternative 1 over a larger geographic area. Having access area opportunities on Georges Bank (CAI) where scallop market grades could be expected to be larger than in the Nantucket Lightship-South area could lead to increased revenues for the LAGC IFQ component (Alternative 2 vs. Alternative 3).

6.6.1.4.3 Alternative 3 - Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation evenly across the Nantucket Lightship-South and Closed Area I

Alternative 3 could have positive economic impacts on LAGC IFQ vessels overall, and compared to Alternative 1. While the allocation of access area trips to the LAGC IFQ component is viewed as a positive, this alternative in FW34 would allocate 1,071 LAGC IFQ trips, which is 1,212 total trips less than the FY2021 allocation.

Alternative 3 could be expected to have slight negative impacts relative to Alternative 2. Alternative 3 would provide more opportunities to fish in access areas compared to Alternative 1 over a larger geographic area. Under Alternative 3, the number of total access area trips to the NLS-South would increase compared to Alternative 2. Since market grades from the NLS-S are projected to be small (30+ counts), and LPUE in the open bottom is projected to decline in FY2021, LAGC IFQ vessels may have fewer opportunities to target larger scallops in areas of high abundance under Alternative 3.

6.6.1.5 Action 5 – Additional Measures to Reduce Fishery Impacts

6.6.1.5.1 Alternative 1 – No Action

The No Action alternative is expected to have negligible economic impacts on the scallop fishery as a whole compare to Alternative 2. 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. 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 and higher LPUE.

6.6.1.5.2 Alternative 2 - Allow RSA compensation fishing in the NLS-South, Closed Area II, and Closed Area I, with limited RSA compensation fishing in the NGOM Management Area

Alternative 2 is expected to have negligible to slightly positive economic benefits over the long-term for the scallop fishery.

Alternative 2 could be expected to have slightly positive economic impacts relative to Alternative 1. Under Alternative 2, RSA compensation fishing would be permitted in the following areas in FY2022:

- Areas open to Limited Access DAS fishing (i.e., open bottom)
- Closed Area II, from June 1, 2022 – August 15, 2022
- Closed Area I
- Nantucket Lightship-South
- NGOM Management area (up to the 25,000 in this area)

RSA compensation fishing would be permitted in the NGOM management area, RSA compensation fishing would be permitted in the NGOM management area up 25,000 pounds, and only by vessels that are awarded NGOM RSA compensation pounds.

Since this option would allow directed scallop fishing on larger animals in high densities scallops in access areas, it could result in lower trip costs compared to open area fishing. Access to larger scallops in access areas could have positive effect on revenues, which is an important part of the RSA program.

This provision will help accurately account for scallop removals in the NGOM . facilitates access to high densities of scallops in available access areas, and is expected to reduce impacts on small scallops and overall mortality in Closed Area II

6.6.2 Social Impacts

6.6.2.1 Action 1 – Overfishing Limit and Acceptable Biological Catch

6.6.2.1.1 Alternative 1 – No Action

Under No Action, the OFL and ABC would be set at the default values for FY 2022, which were adopted by the Council through FW33 (Table 52). The ABC excluding discards would be 28,074 mt and the ABC for FY 2023 would be 0 mt.

The social impacts of No Action would likely be moderate negative. With no change in the FY 2022 ABC from the default, there would be a degree of constancy and predictability for fishing industry operations. However, this ABC is 8% lower than that of FY 2021 (30,517 mt). While fishery allocations are not linked to ABC (set in Action 3), the decline in the ABC is a bellwether for scallop resource as a whole and may lead to reduced levels of harvest in the fishery. The employment levels of the fishery-related workforce could be lowered, and the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) could be altered. The SSC recommended 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. Because the default ABC for FY 2023 would be 0 mt (i.e., there would be no fishery), unless the Council takes a future action that sets ABC, and it is implemented on-time, stakeholders could perceive the use of default specifications for sea scallops as a fishery management failure.

6.6.2.1.2 Alternative 2 – Update OFL and ABC for FY 2022 and FY 2023 (default)

Under Alternative 2, the OFL and ABC for FY 2022 would be set based on the results of the most recent stock assessment and at levels recommended by the SSC (Table 52). The ABC excluding discards would be 25,724 mt for FY 2022 and the default for FY 2023 would be 23,200 mt.

The social impacts of Alternative 2 would likely be slight negative and more positive than No Action. The ABC in FY 2022 would be 16% lower than in FY 2021 (30,517 mt) and 8% lower than the FY 2022 default level. While fishery allocations are not linked to ABC (set in Action 3), the decline in the ABC is a bellwether for scallop resource as a whole and may lead to reduced levels of harvest in the fishery. Employment levels of the fishery-related workforce could be lowered, and the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) could be altered. Although the ABC would be lower, 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. In the long term, the industry could realize the benefits of yield that is supported by the best available science. With a default ABC for 2023, 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.

6.6.2.2 Action 2 – Northern Gulf of Maine Management and TAL Setting

6.6.2.2.1 Alternative 1 – No Action

Under No Action, the default measures for FY 2022 would be in place: the NGOM TAC for FY 2022 would be 74,000 lb, 57% lower than the FY 2021 TAC (171,722 lb) and no default would be set for FY 2023. The closure of Stellwagen Bank (Map 1) would remain and changes to NGOM management recommended by the Council through Amendment 21 would not be implemented, such as the allocation sharing arrangement in Alternative 2. The NGOM TAC would be split between the LAGC and LA components, with 72,000 lb available for directed fishing by the LAGC component at 200 lb per day and 2,000 lb available to be fished as RSA compensation by the limited access component (Table 6).

The social impacts of No Action would likely be negative. With a 56% reduction in the TAC from the FY 2021 level, but no change from the FY 2022 default, the fishery would continue to benefit from fishing in the NGOM, but at much reduced levels. This degree of change could disrupt the constancy and predictability of fishing industry operations and make providing a steady supply to the market a challenge. The size of the fishery-related workforce operating in the NGOM would likely be reduced, as would the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights). Scallop surveys indicate that the No Action NGOM TAC may be higher than is biologically sustainable in the long term (Section 5.2.2). 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. Because the default NGOM TAC for FY 2023 would be 0 mt (i.e., there would be no fishery), unless the Council takes a future action that sets the TAC, and it is implemented on-time, stakeholders could perceive the use of default specifications for this area as a fishery management failure.

Alternative 1 would likely have differential impacts among ports. Gloucester is a key landing port for the vessels that would be fishing the NGOM TAC, particularly the LAGC NGOM vessels, as it is near the most productive fishing grounds in this area and has the necessary shoreside infrastructure to support the fishery. However, the LAGC vessels fishing out of Gloucester are from homeports throughout Maine, New Hampshire, and Massachusetts (Table 31 in Amendment 21).

6.6.2.2.2 Alternative 2 - Re-open Stellwagen Bank and set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery

Under Alternative 2, the NGOM TAL for FY 2022 would be set based on the most recent survey data and at levels recommended by the SSC and a default NGOM TAL for FY 2023 would be set. Alternative 2 would adopt the approaches for NGOM management recommended by the Council through Amendment 21 and the Stellwagen Bank closure area (Map 1) would be reopened to directed scallop fishing.

The social impacts of Alternative would likely be positive and more positive than No Action. The measures recommended through Amendment 21 were expected to improve management of the resource in this area. This would lead to improved attitudes and beliefs of fishermen towards management and on the ability of businesses and households to plan in the long term. The fishery would continue to benefit from fishing in the NGOM. Benefits would continue to accrue to both LA and LAGC, but the resource sharing formula adopted through Amendment 21 would let LA vessels commercially fish in the area when biomass is above the trigger threshold, expanding the long-term benefits of fishing in the NGOM to more fishery components. For these specifications however, biomass expected to be below the trigger, so a directed LA fishery would not be allowed for FY 2022-2023.

There are three options for setting the NGOM TAL at varying F rates that result in FY 2022 TALs ranging from a low of 559,974 lb under Option 1 to a high of 727,525 lb under Option 3. While Option 3 may lead to more positive short-term social impacts due to allowing the highest landings, in the long-term the most positive social impacts would more likely accrue under Option 1, which has the most conservative TAL. In the long term,

ensuring continued, sustainable harvest of the resource benefits all fisheries. The Option 2 positive impacts would fall between the more positive Option 1 impacts and the lower Option 3 impacts.

Alternative 2 would likely have differential impacts among ports with the short-term positive impacts accruing more to the port of Gloucester for the same reasons as described under No Action. In the long term, if Alternative 2, and particularly Option 1, allows for the most growth in the scallop resource, biomass may increase substantially and become more distributed throughout the area. Thus, LAGC landings may increase in more northerly ports as well. Alternative 2 may more quickly lead to biomass being above the trigger that would allow for more directed harvest by the LA fishery component. These vessels are distributed throughout the range of the entire resource; many are based out of New Bedford but occur down to North Carolina.

6.6.2.3 Action 3 – Fishery Specifications and Rotational Management

Action 3 sets specifications for open area DAS and access area trip allocations. The alternatives are based on Alternative 2 for OFL and ABC (Section 4.2.1). The LA (94.5%) and LAGC IFQ (5.5%) allocations are based on the Annual Projected Landings (APL).

6.6.2.3.1 Alternative 1 – No Action

Under No Action, the FY 2022 specifications (default approved in Framework 33) would include 18 full-time LA open area DAS, 75% of the FY 2021 DAS. Part-time and occasional LA vessels would have 7.2 and 1.5 DAS, respectively. The FT LA component would be allowed one 18,000 lb trip in the Mid-Atlantic Access Area (Map 2). The total LAGC IFQ allocation would be 1,570,455 lb, 75% of the FY 2021 LAGC IFQ allocation. LAGC IFQ vessels would have access in the MAAA on April 1, 2022, with a fleet wide maximum of 571 trips. The target TAC for vessels with an LAGC incidental permit would be 50,000 lb.

The social impacts of No Action would be negative. Fishing would be allowed, but at substantially reduced levels relative to FY 2021. Open area access would only be allowed for LA vessels and fishing in the rotational access areas would be limited to just one area, the MAAA. Landings, revenue, and total economic benefits would likely be lower than Status Quo (FY 2021), providing substantially fewer fishing opportunities. Employment (i.e., crew limit * DAS) is modeled to be lower under No Action relative to Status Quo. Thus, the size of the fishery-related workforce would likely decrease. Given these specifications are only for the next two years, any change to the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) would be minor and difficult to predict. Fishermen could perceive the selection of No Action as a fishery management failure (e.g., no default for FY 2023) and it might cause distrust in management among the industry, and a feeling that managers are not making use of the best available science which indicates that scallop fishing would be sustainable in additional areas and using more DAS. No Action may lead to negative impacts on the attitudes of stakeholders towards management. The industry could not realize the benefits of yield that is supported by the best available science. The social impacts could be negative in the long term because no access would be specified for FY 2023, unless the Council takes a future action to set specifications.

6.6.2.3.2 Alternative 2 - Three Access Area trips, with the Hudson Canyon closed and closures of the New York Bight and Nantucket Lightship West

Under Alternative 2, specifications for access to the open areas and rotational access areas would be set for FY 2022 and default measures for FY 2023. The full-time LA vessels would have access area trips to Closed Area II (two trips) and the Nantucket Lightship South (one trip, Map 6), each with a possession limit of 15,000 lb. The Closed Area 1 Access Area would be available for RSA compensation fishing by the LA component and for LAGC access area fishing. On May 31, 2022, the Hudson Canyon portion of the Mid-Atlantic Access Area (MAAA) would be closed to the scallop fishery and the Elephant Trunk portion of the MAAA would revert to open bottom, available to LA vessels fishing DAS and LAGC IFQ vessels on open trips (Map 3). Alternative 2 would establish the combined New York Bight (NYB)/Hudson Canyon (HC) closure as well as the Nantucket Lightship West (NLS-West) closure (Map 3). Options 1 and 2 would set open area fishing at F=0.34 (20 DAS)

and F=0.47 (26 DAS), respectively. The APL (after set-asides removed) under these options would be 29.1M lb and 33.4M lb, respectively.

The social impacts of both Alternative 2 options are likely positive. Impacts would be more positive than No Action. Landings, revenue, and total economic benefits would likely be higher than No Action, providing substantially more fishing opportunities and participation and more positive social impacts. Social impacts of the Alternative 2 options are likely negligible relative to each other and the Alternative 3 options and less positive than Status Quo (FY 2021). Given these specifications are only for the next two years, any change to the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) would be minor and difficult to predict. Allowing trip exchanges, in 7,500 lb increments, would provide continued flexibility of fishing operations. Alternative 2 would also increase the crew limit by two for fishing in NLS-S, which would allow for more efficiency and a small increase in employment opportunities, expanding the crew limit increase from FY 2021 (only in NLS-S-deep). Scallops in NLS-S are generally small, so without this allowance, trips to this area would likely be longer to harvest the trip limit. Setting default measures for FY 2023 leads to greater predictability and business planning, which have positive social outcomes.

6.6.2.3.3 Alternative 3 - Three Access Area Trips, with the Hudson Canyon and Elephant Trunk reverted to open bottom and closures of the New York Bight and Nantucket Lightship West

Under Alternative 3, specifications for access to the open areas and rotational access areas would be set for FY 2022 and default measures for FY 2023. Like Alternative 2, the full-time LA vessels would have access area trips to Closed Area II (two trips) and the Nantucket Lightship South (one trip, Map 6), each with a possession limit of 15,000 lb. The Closed Area 1 Access Area would be available for RSA compensation fishing by the LA component and for LAGC access area fishing. On May 31, 2022, the entire Mid-Atlantic Access Area (MAAA) would revert to open bottom (the Hudson Canyon portion is closed under Alternative 2) and would be available to LA vessels fishing DAS and LAGC IFQ vessels on open trips (Map 6). Like Alternative 2, Alternative 3 would establish the New York Bight (NYB) and Nantucket Lightship West (NLS-West) closure areas (Map 6). Options 1 and 2 would set open area fishing at F=0.33 (20 DAS) and F=0.45 (26 DAS), respectively. The APL (after set-asides removed) under these options would be 29.0M lb and 33.4M lb, respectively.

The social impacts of both Alternative 3 options are likely positive. Impacts would be more positive than No Action. Landings, revenue, and total economic benefits would likely be higher than No Action, providing substantially more fishing opportunities and participation and more positive social impacts. Social impacts of the Alternative 3 options are likely negligible relative to each other and the Alternative 2 options and less positive than Status Quo (FY 2021). Given these specifications are only for the next two years, any change to the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) would be minor and difficult to predict. Allowing trip exchanges, in 7,500 lb increments, would provide continued flexibility of fishing operations. Alternative 3 would also increase the crew limit by two for fishing in NLS-S, which would allow for more efficiency and a small increase in employment opportunities, expanding the crew limit increase from FY 2021 (only in NLS-S-deep). Scallops in NLS-S are generally small, so without this allowance, trips to this area would likely be longer to harvest the trip limit. Setting default measures for FY 2023 leads to greater predictability and business planning, which have positive social outcomes.

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

6.6.2.4.1 Alternative 1 – No Action (Default Measures from FW33)

Under Alternative 1, the FY 2022 LAGC IFQ access area trips, with a 600 lb trip limit, would be 571 trips to the MAAA, the default from Framework 33.

The social impacts of No Action are likely negative. For FY 2021, there were 2,283 access area trips for this fishery component, to the MAAA, CA I and NLS-S-deep, so No Action would result in a substantial reduction from present conditions. Fishing in the rotational access areas would be limited to just one area. LAGC IFQ

vessels would still be allowed to fish in open areas, but the scallop resource is generally less dense in open areas, so fishing operations tend to be less efficient. No Action would provide less fishing opportunities. Employment and the size of the fishery-related workforce would likely decrease. The historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) would likely change, though it is difficult to predict specifically how. Fishermen could perceive the selection of No Action as a fishery management failure and it might cause distrust in management among the industry, and a feeling that managers are not making use of the best available science which indicates that scallop fishing would be sustainable in additional areas and using more DAS. This may lead to negative impacts on the attitudes of stakeholders towards management. No Action may lead to a perception among LAGC IFQ fishermen of management unfairness if their effort in the access areas is substantially constrained while the LA effort continues. The social impacts could be negative in the long term because no access would be specified for FY 2023, unless the Council takes a future action to set the ABC.

6.6.2.4.2 Alternative 2 - Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation to Closed Area I Only

Under Alternative 2, the FY 2022 LAGC IFQ access area trips would be 1,071 total with an 800 lb trip limit, adopting the trip limit increase recommended by the Council through Amendment 21. Trips would be allowed in the NLS-S and CAI (effort shifted from CAII), with more trips in CAI than NLS-S.

The social impacts of Alternative 2 are likely slight positive. For FY 2021, there were 2,283 access area trips for this fishery component, so Alternative 2 would result in a reduction from present conditions. Relative to No Action, the social impacts would be positive, leading to more opportunity for the LAGC IFQ to harvest scallops from access areas. Employment opportunities, the size of the fishery-related workforce and the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) could be sustained, but would not necessarily change relative to current conditions. Alternative 2 would likely lead to a perception among LAGC IFQ fishermen of management fairness, relative to No Action, as their effort in the access areas could continue along with that of the LA effort. This may lead to more positive impacts on the attitudes of stakeholders towards management. Access would be allowed in multiple access areas, so vessels based in a wider geographic range of ports could benefit from fishing in the access areas relative to No Action. Shifting effort from CAII to CAI could improve the safety of vessel operations as CAI is more assessable to the vessels in the LAGC IFQ fleet (generally smaller than LA vessels) than CAII which is further offshore. The social impacts of Alternative 2 may be more positive than under Alternative 3, because more trips are allocated to CAI than to NLS-S and scallops in CAI are likely to be of higher market grade than in NLS-S, so of greater value to the fishery.

6.6.2.4.3 Alternative 3 - Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation evenly across the Nantucket Lightship-South and Closed Area I

Under Alternative 3, the FY 2022 LAGC IFQ access area trips would be 1,071 total with an 800 lb trip limit, adopting the trip limit increase recommended by the Council through Amendment 21 (Like Alternative 2). Trips would be allowed in the NLS-S and CAI (effort shifted from CAII), with more trips in NLS-S than CAII.

The social impacts of Alternative 3 are likely slight positive. For FY 2021, there were 2,283 access area trips for this fishery component, so Alternative 3 would result in a reduction from present conditions. Relative to No Action, the social impacts would be positive, leading to more opportunity for the LAGC IFQ to harvest scallops from access areas. Employment opportunities, the size of the fishery-related workforce and the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights) could be sustained, but would not necessarily change relative to current conditions. Alternative 3 would likely lead to a perception among LAGC IFQ fishermen of management fairness, relative to No Action, as their effort in the access areas could continue along with that of the LA effort. This may lead to more positive impacts on the attitudes of stakeholders towards management. Access would be allowed in multiple access areas, so vessels based in a wider geographic range of ports could benefit from fishing in the access areas relative to No Action.

Shifting effort from CAII to CAI could improve the safety of vessel operations as CAI is more assessable to the vessels in the LAGC IFQ fleet (generally smaller than LA vessels) than CAII which is further offshore. The social impacts of Alternative 3 may be less positive than under Alternative 2, because more trips are allocated to NLS-S than to CAI and scallops in NLS-S are likely to be of lower market grade than in CAI, so of less value to the fishery.

6.6.2.5 Action 5 – Additional Measures to Reduce Fishery Impacts

6.6.2.5.1 Alternative 1 – No Action

Under No Action, the default set for FY 2022 in Framework 33 would continue: 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.

The social impacts of No Action would likely be slight positive, as RSA compensation fishing could continue, but slight negative relative to Alternative 2, because the fishery would not have the opportunity harvest compensation pounds from access areas, which generally have higher densities of exploitable scallops. Fishing operations could be less efficient relative to Alternative 2. As RSA compensation fishing represents a small portion to total fishing effort, No Action would likely have negligible impacts on employment, the size of the fishery-related workforce, or the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights).

6.6.2.5.2 Alternative 2 - Allow RSA compensation fishing in the NLS-South, Closed Area II, and Closed Area I, with limited RSA compensation fishing in the NGOM Management Area

Under Alternative 2, in addition to areas open to LA DAS fishing (No Action), RSA compensation fishing would be permitted in FY 2022 in the following areas (Map 8): CAII (June 1 – August 15, 2021), CAI, NLS-S, NGOM (up to 25,000 lb).

The social impacts of Alternative 2 would likely be positive and slight positive relative to No Action, because the fishery would have the opportunity harvest compensation pounds from certain access areas, which generally have higher densities of exploitable scallops than open areas. Fishing operations could be more efficient relative to No Action. As RSA compensation fishing represents a small portion to total fishing effort, Alternative 2 would likely have negligible impacts on employment, the size of the fishery-related workforce, or the historical dependence on and participation in the fishery (structure of fishing practices, income distribution and rights). Alternative 2 may incentivize additional vessels to participate in compensation fishing.

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