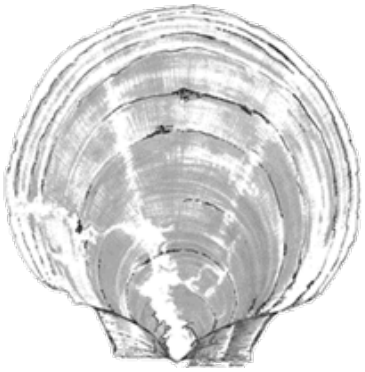
Scallop Fishery Management Plan

Framework Adjustment 36

Including an Environmental Assessment and

Regulatory Flexibility Analysis



Final Submission

March 9, 2023

Prepared by the

New England Fishery Management Council

In consultation with the

National Marine Fisheries Service

New England
Fishery Management Council

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FRAMEWORK ADJUSTMENT 36 TO THE ATLANTIC SEA SCALLOP FISHERY MANAGEMENT PLAN

Proposed Action: Propose updated fishery specifications for FY 2023 and FY 2024 (default) with corresponding management measures and manage removals from the NGOM management area.

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Abstract:

1.0 EXECUTIVE SUMMARY

Framework 36 (FW36) will set specifications and adjust management measures for the Atlantic Sea Scallop fishery for fishing years 2023 and 2024 (default) 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 (NGOM). The Council considered a range of alternatives for this framework.

In Action 1, Overfishing Limit and Acceptable Biological Catch, the Council selected Alternative 4.1.2, update the overfishing limit (OFL) and acceptable biological catch (ABC) for FY 2023 and FY 2024 (default) as preferred. The ABC value with discards removed for FY2023 is 19,828 mt, which is lower than the FY2022 value of 25,724 mt.

In Action 2, the Council developed NGOM management measures that were consistent with Amendment 21 to the Scallop FMP. This includes increasing the overall scallop Research Set-Aside (RSA) by 25,000 pounds and setting aside scallops to support monitoring of directed fishing in the management area. The Council's preferred alternative (Alternative 4.2.2.3) would set the overall NGOM TAL at 434,311 pounds, and the 2023 NGOM Set-Aside would be set at 380,855 pounds. The 2024 default NGOM Set-Aside would be set at 285,641 pounds.

For Action 3, the Council developed a range of fishery specifications for FY 2023 and default measures for FY 2024 for both limited access and limited access general category vessels. The Council selected Alternative 4.3.3.2 as the preferred alternative. The preferred alternative would set limited access open area days-at-sea (DAS) allocations at an open area fishing mortality rate of F=0.51, which corresponds to 24 open area days-at-sea for full-time LA vessels and 9.6 DAS for part-time vessels in FY 2023. The total landings associated with the preferred alternative are projected to be roughly 25 million pounds. The alternative closes the Elephant Trunk, New York Bight (NYB), Nantucket Lightship West, and Area I in FY2023.

The annual projected landings (APL) is calculated by reducing the total landings by set-asides and incidental removals. The APL is then split between the LA (94.5%) and the LAGC IFQ (5.5%) components. Not including set-asides or incidental catch, the annual projected landings for FY 2023 are estimated to be approximately 22.86 million pounds, with LA harvest around 21.6 million pounds, and LAGC IFQ set at roughly 1.14 million pounds. The observer set aside would be approximately 437,000 pounds, the research set-aside (RSA) would be set at 1.275 million pounds, and landings from incidental limited access permits are estimated to be 50,000 pounds.

The full-time limited access possession limit for all access areas open to the fishery under this alternative is set to 12,000 pounds. The preferred alternative would allocate a total of 24,000 pounds to full-time limited access vessels in Area II (two trips, 12,000 pounds each) (Map 6). The part-time limited access trip limit would be set at 9,600 pounds and part-time vessels would receive one Area II trip. Scallop RSA compensation fishing would be available in open bottom, the Northern Gulf of Maine management unit, and the Nantucket Lightship North for LAGC IFQ vessels. Compensation fishing in the NGOM management area would be restricted only to vessels that receive NGOM RSA compensation pounds

This action also includes default measures for FY 2024. These default measures were developed to be in place only until a subsequent action implements updated allocations for FY 2024. The FY 2024 default measures under Alternative 4.3.3.2 would set at 75% of the LAGC IFQ quota and Limited Access DAS allocations from FY2023.

Action 4 designates the number of LAGC IFQ access area trips that may be taken in open rotational access areas. The preferred alternative in Action 4 is Alternative 4.4.2, which would allocate a total of 571 trips which would be available to fish at the 800-pound trip limit in either the Nantucket Lightship

North or Area II. 571 trips is the 800-pound trip equivalent of 5.5% of the full-time LA access area allocation under the Council's preferred specification alternative (Alternative 4.3.3.2). The Nantucket Lightship North would be reserved as an access area for the LAGC IFQ component for the first 90 days of FY2023 (i.e., April 1, 2023 through June 29, 2023). During this time, the only directed scallop fishing that could occur in the Nantucket Lightship North would be LAGC IFQ vessels fishing access area trips including trips that are fishing Research Set-Aside (RSA) compensation pounds. After the first 90 days of FY2023 (i.e., starting June 30, 2023), the Nantucket Lightship North would become available to the LA component as part of the open bottom and LA vessels could choose to fish there while operating under days-at-sea management. LAGC IFQ vessels would be able to continue fishing access area trips at an 800-pound possession limit in the Nantucket Lightship North until the total LAGC IFQ access area trip allocation is projected to have been caught. Once the total LAGC IFQ access area trip allocation is projected to have been caught, the Nantucket Lightship North would be considered part of the open bottom for the LAGC IFQ component and vessels could choose to fish open trips in this area at the 600-pound possession limit.

Framework 36			Council Rationale
Action 1: Overfishing Limit (OFL) and Acceptable Biological Catch (ABC)			The Council recommends the updated OFL/ABC values in Alternative 2 as preferred because they are based on the most recent estimates of scallop biomass and are recommended by the SSC. Setting the OFL and ABC using 2022 survey data should reduce the likelihood of overfishing compared to using outdated information. The estimate of scallop biomass is based on annual surveys, and in some cases multiple surveys are conducted in more critical areas. Overall, using the updated OFL and ABC estimates should have positive biological impacts to the scallop resource over the long-term because the ABC values were determined based on the most recent scientific information available to prevent overfishing of the scallop resource and to optimize yield-per-recruit.
4.1.1	Alternative 1	No Action for OFL and ABC	
4.1.2	**Alternative 2 (Preferred)**	**Updated OFL and ABC for FY2023 and FY2024**	

<table>
<tr><th colspan="3">Framework 36</th><th>Council Rationale</th></tr>
<tr><td colspan="3">Action 2 – Northern Gulf of Maine Management and TAL Setting</td><td rowspan="5">The Council's preferred option, Alternative 2, implements an overall cap on landings from the area, and distributes landings across set-asides to support research, monitoring, and a directed LAGC fishery.

The NGOM TAL options developed by the Council are based on conservative F_{TARGET} rates (F=0.15 to F=0.18). The preferred option, Option 3 (F=0.15 using Stellwagen, Ipswich, and Jeffreys Ledge), is expected to result in lower overall landings for the LAGC component compared to the 2022 FY. The NGOM set-aside would be 380,855 pounds for FY2023. The preferred alternative could be expected to result in lower fishery revenue relative to No Action, but positive biological impacts for the sea scallop resource in the region. Impacts on protected resources could be considered slightly negative.</td></tr>
<tr><td>4.2.1</td><td>Alternative 1</td><td>No Action</td></tr>
<tr><td rowspan="3">4.2.2</td><td rowspan="3">Alternative 2 (Preferred) - Set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery</td><td>Option 1: Set NGOM TAL at F=0.15 using Stellwagen Only</td></tr>
<tr><td>Option 2: Set NGOM TAL at F=0.18 using Stellwagen Only</td></tr>
<tr><td>Option 3: Set NGOM TAL at F=0.15 using Stellwagen, Ipswich, and Jeffreys Ledge (Preferred)</td></tr>
<tr><td></td><td></td><td>Option 4: Set NGOM TAL at F=0.18 using Stellwagen, Ipswich, and Jeffreys Ledge</td><td></td></tr>
</table>

<table>
<tr><th colspan="3">Action 3: 4.3 – Fishing Year 2023 & 2024 Specifications and Rotational Management</th><th>Council Rationale</th></tr>
<tr><td>4.3.1</td><td>Alternative 1</td><td>No Action: 1 trip to CAII, 18 DAS</td><td rowspan="6">A full description of the preferred specifications alternative, Alternative 3, can be found in Section 4.3.3. The overall F rate associated with the Council's preferred alternative is estimated to be F=0.24, which is well below at F=0.45 used for the ABC/ACL. The preferred open area F rate (F=0.51) is also less than the OFL at F=0.61, which is considered the upper limit for fishing mortality as of the 2020 Management Track Assessment (2020).

Spatial management is the same in Alternatives 2, 3, and 4. The impacts to the scallop resource, EFH, protected resources, non-target species, as well as the economic, and social impacts of the measures that the Council considered for FY 2023 and FY 2024 vary depending on the number of DAS allocated and differences in trip limits to Area II. The Council's preferred alternative would allocate 24 DAS. The preferred alternative is expected to result in scallop landings of 25.0 million pounds. Total revenue is estimated to be $398.63 million dollars, which is $19 million dollars less than the highest revenue estimate under consideration. Area swept estimates for Alternative 3 Option 2 (preferred) are lower than Status Quo and Alternative 4 Option 2. The bycatch estimates are above and below the anticipated sub-ACLs approved by the Council through groundfish Framework 65 for the preferred alternative. The projections are forecasts with error and should not be interpreted as precise estimates. Review of past estimates has shown that the projections have over- and under-estimated catches. Fishing year 2022 is the first year a reactive accountability measure is in place for northern windowpane flounder. This, and other factors considered in the Council's selection of Alternative 3 Option 2, are expected to reduce northern windowpane and GB yellowtail bycatch, such that the realized catches would be lower than the point estimate used in this framework.</td></tr>
<tr><td rowspan="2">4.3.2</td><td rowspan="2">Alternative 2, Two access area trips in Area II with 10,000-pound trip limit</td><td>Option 1: F=0.46, 22 DAS</td></tr>
<tr><td>Option 2: F=0.51, 24 DAS</td></tr>
<tr><td rowspan="2">4.3.3</td><td rowspan="2">Alternative 3,
Two access area trips in Area II with 12,000-pound trip limit
(Preferred)</td><td>Option 1: F=0.46, 22 DAS</td></tr>
<tr><td>Option 2: F=0.51, 24 DAS
(Preferred)</td></tr>
<tr><td rowspan="2">4.3.4</td><td rowspan="2">Alternative 4,
Two access area trips in Area II with 14,000-pound trip limit</td><td>Option 1: F=0.46, 22 DAS</td></tr>
<tr><td>Option 2: F=0.51, 24 DAS</td></tr>
</table>

Action 4: Access Area Trip Allocations to the LAGC IFQ Component			Council Rationale
4.4.1	Alternative 1	No Action (357 trips, default measure)	The Council recommends Alternative 2 (Section 4.4.2), setting the overall LAGC IFQ access area allocation at 5.5% of the total access area allocations, with an 800-pound trip limit. This results in 571 trips that can be taken in either Area II or Nantucket Lightship North. The preferred alternative increases the opportunity for LAGC IFQ vessels to operate in access areas relative to No Action, but below FY 2022 levels. This option could have potentially slight positive impacts on the resource overall by spreading effort out and providing more access in areas with higher catch rates. It also could potentially reduce total area swept since the LAGC IFQ component would have the opportunity to fish on scallops in access areas. The preferred alternative could be expected to help reduce fishing times and lower trips costs, particular if the LAGC component elects to fish in Nantucket Lightship North. If LAGC trips are not taken in the access areas, LAGC catch is assumed to come from open areas instead. This could result in lower or higher catch efficiency relative to the access area trips, depending on the open area fished and the resource conditions there. The impacts on non-target species would likely be mixed, as a concentration of fishing in one stock area is likely to reduce effort in other stock areas; however, less adverse impacts to non-target species would be expected in areas with higher scallop catch rates relative to areas with lower scallop catch rates. Allowing the LAGC IFQ component to harvest their share of the Area II access area allocations in Nantucket Lightship North is expected to limit steam time and lower overall trips costs across the entire LAGC IFQ component.
4.4.2	**Alternative 2 (Preferred)**	**Update LAGC IFQ Access Area Trip Allocations, Distribute Closed Area II Access Area Allocation to CAI Only** **Allocated LAGC IFQ AA trips available in either Area II or Nantucket Lightship North: 571**	

2.0 TABLE OF CONTENTS

2.1 TABLES

2.2 FIGURES

2.3 MAPS

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 as modified by the Phase I 2022 revisions. The effective date of the 2022 revisions was May 20, 2022 and reviews begun after this date are required to apply the 2020 regulations as modified by the Phase I revisions unless there is a clear and fundamental conflict with an applicable statute. This EA began on June 30, 2022 and accordingly proceeds under the 2020 regulations as modified by the Phase I revisions.

3.1 BACKGROUND

This framework adjustment to the Scallop Fishery Management Plan (FMP) sets fishery specifications for fishing year (FY) 2023 and default measures for FY 2024.

The list of measures routinely addressed as part of scallop specifications has increased over the years to include overall annual catch limits and 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.

3.2 Purpose and Need

The purpose and need for Framework 36 are described in Table 1.

Table 1 – Purpose and need for Framework 36.

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 2023 fishing year, as well as default measures for FY2024 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 the 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).

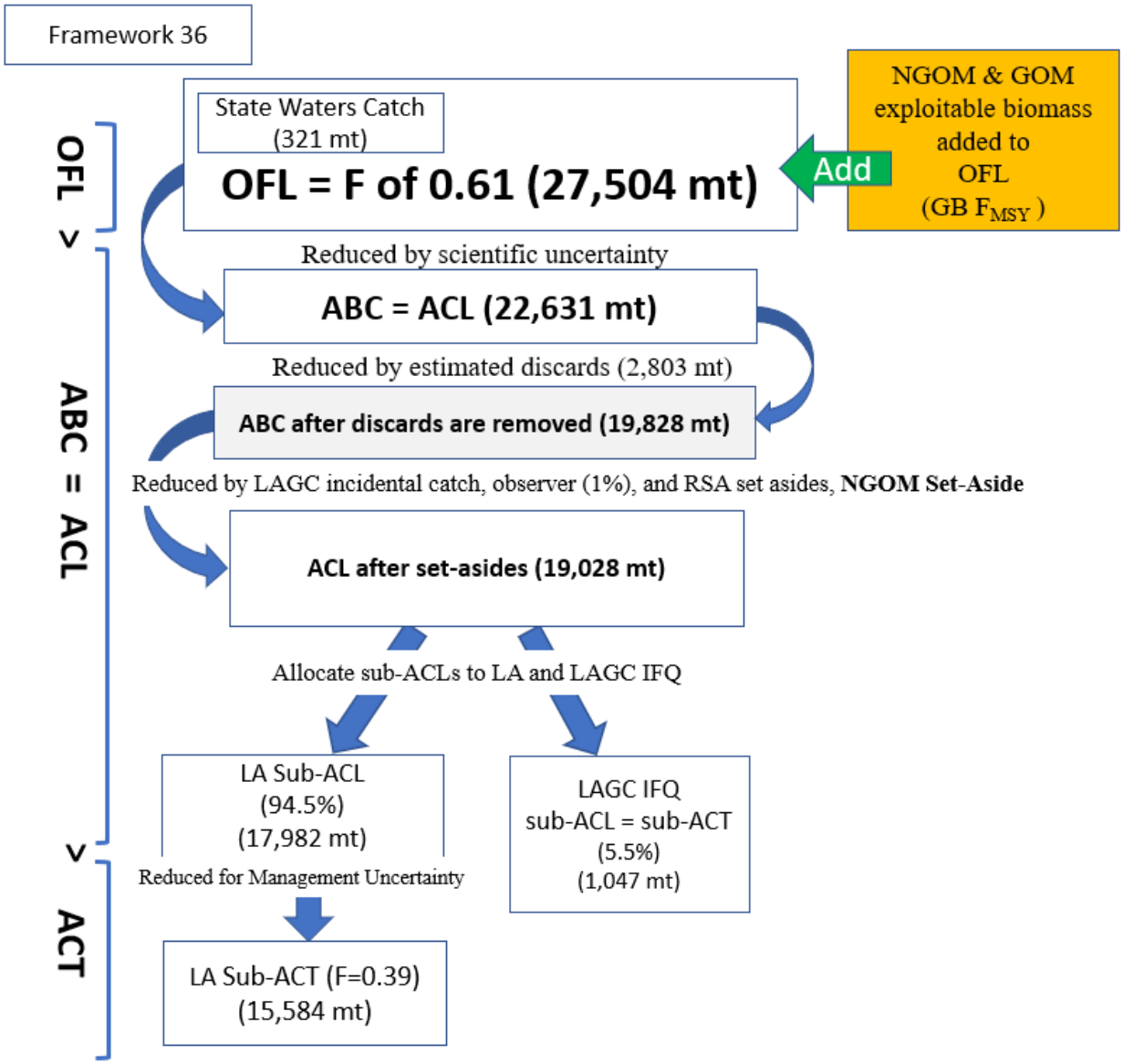
Annual Catch Limit. The ACL is equal to the ABC in the Scallop FMP. The 2020 management track assessment determined that the F associated with the ABC/ACL is F=0.45. As specified in Amendment 21, exploitable biomass from the Northern Gulf of Maine contributes to the overall OFL and ABC. Observer and 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 forecasting 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 - Framework 36 ACL flowchart for fishing year 2023.



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 FY2023 OFL and ABC would be the default values adopted in Framework 34 (Table 2) that were calculated using survey and fishery data through 2021. These default values would remain in place until a subsequent action replaced them. There would be no OFL or ABC set for FY2024. The OFL and ABC values are developed using the following scallop control rule: 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. The fishing mortality rate associated with the OFL is F=0.61 and the F associated with the ABC is F=0.45. These values include estimated discards. Therefore, when the fishery specifications are set based on these limits (Table 3), the estimate of discards is subtracted first and allocations are based on the remaining ABC available (Table 2, column to the far right).

Rationale: This is the default OFL and ABC specified by the Council through Framework 34, which reflect reference points from the 2020 management track scallop assessment and is based on observations from the 2021 scallop surveys.

Table 2 – No Action OFL and ABC for FY2023 (default) approved through Framework 34 (values in mt).

Fishing Year	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards subtracted)
2023	34,941	27,606	4,406	23,200

Table 3 – No Action (default) ACL related values for the scallop fishery based on 2023 OFL and ABC approved through Framework 34.

Catch limits	FY2023 (mt)
Overfishing Limit	34,941
Acceptable Biological Catch/ACL (discards removed)	23,200
Incidental Catch (Estimated catch by LAGC Cat. C permits)	23
Research Set-Aside (RSA)	578
Observer Set-Aside	232
ACL for fishery	22,367
Limited Access ACL (94.5% of ACL)	21,137
LAGC Total ACL	18,318
LAGC IFQ ACL (5% of ACL)	1,230
Limited Access with LAGC IFQ ACL (0.5% of ACL)	1,118
Limited Access ACT (F=0.46)	112
Annual Projected Landings (APL)***	(*)
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.

***The APL value reflects the Council's preferred alternatives for specifications from FW36.

4.1.2 Alternative 2 - Updated OFL and ABC for FY 2023 and FY 2024 (default) (*Preferred Alternative*)

Alternative 2 would specify OFLs and ABCs for FY 2023 and set default values for FY 2024 (Table 4) using the scallop control rule. The fishing mortality rates for OFL and ABC would be based on the results of the 2020 management track assessment for Atlantic sea scallops, with the OFL at F=0.61 and the ABC set at 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 uses 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, some annual variability in exploitable biomass is anticipated, which is reflected in the updated OFL and ABC.

Table 4 - OFL and ABC values for FY 2023 and FY 2024 (default).

Fishing Year	OFL (including discards at OFL)	ABC (including discards)	Discards (at ABC)	ABC available to fishery (after discards removed)
2023	27,504	22,631	2,803	19,828
2024	29,151	23,289	3,083	20,206

Table 5 - Alternative 2 – ACL related values for the scallop fishery based on 2023 and 2024 OFL and ABC

	FY2023	FY2024
	mt	mt
OFL	27,504	29,151
ABC/ACL (discards removed)	19,828	20,206
Incidental Catch	23	23
RSA	578	578
Observer set-aside	198	202
ACL for fishery	18,853	19,403
Limited Access ACL	17,816	18,335
Limited Access ACT	15,441	15,891
LAGC Total ACL	1,037	1,067
LAGC IFQ ACL	943	970
LA w/ LAGC IFQ ACL (0.5% of ACL)	94	97
APL (after set-asides are removed)***	10,368	(*)
Limited Access Projected Landings (94.5% of APL)	9,798	(*)
Total IFQ Annual Allocation (5.5% of APL)****	570	428
LAGC IFQ Annual Allocation (5% of APL)	518	389
Limited Access with LAGC IFQ Annual Allocation (0.5% of APL)	52	39

*The catch limits for the 2024 fishing year are subject to change through a future specifications action or framework adjustment. This includes the setting of an APL for 2024 that will be based on the 2023 scallop surveys.

**As a precautionary measure, the 2024 IFQ annual allocations are set at 75% of the 2023 IFQ Annual Allocations.

***The APL value reflects the Council's preferred alternatives for specifications from FW36.

****Poundage allocations to the LAGC IFQ component are specified in Action 3, 4.3.

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

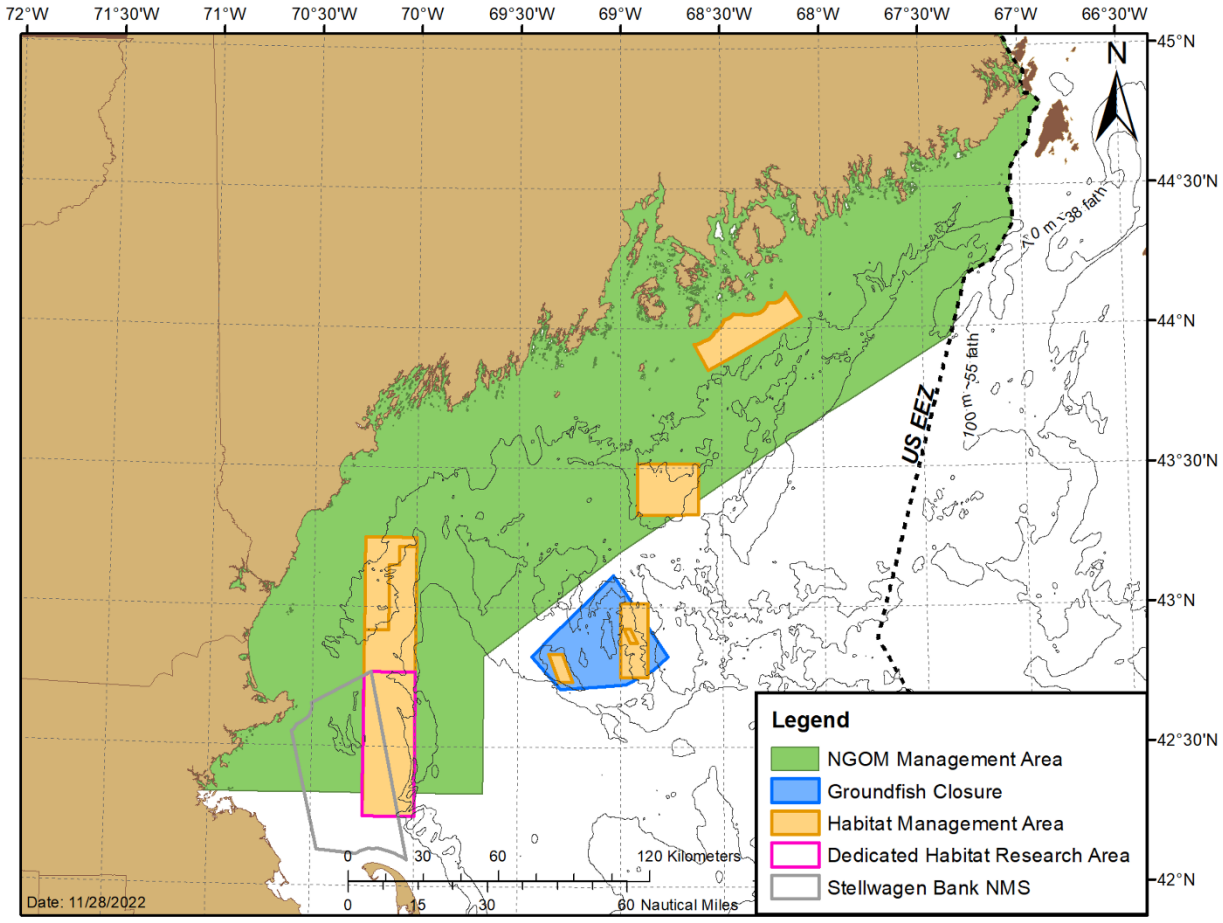
4.2.1 Alternative 1 – No Action

Under Alternative 1 – No Action, the default specifications approved in Framework 34 for the NGOM Set-Aside would be in place for the 2023 fishing year. The FY2023 default NGOM Set-Aside was set at 465,980 pounds. In FY2023 NMFS would implement a reactive AM that accounts for payback of the

17,918 pound LAGC overage from FY2021. Under No Action, the NGOM set-aside would be set at 448,062 pounds, and there would be no value specified for the 2024 fishing year.

Rationale: Specifying the 465,980 pound NGOM Set-Aside and capping removals in the NGOM is consistent with management structure established by the Council through Amendment 21 and implemented through Framework 34. This NGOM Set-Aside is the default set by the Council through Framework 34, which is based on 2021 survey information.

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.



4.2.2 Alternative 2 - Set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery (*Preferred Alternative*)

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY 2023 and FY 2024 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Options 1 and 2 would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank only. Options 3 and 4 would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge.

All options under Alternative 2 would set total allowable landings for all permit categories in the management area, which would be reduced by 25,000 pounds to increase the overall scallop RSA (Table 6). The total allowable landings would also be reduced by 1% of the NGOM ABC (10,538 pounds) to support monitoring the directed scallop fishery in the NGOM (Table 6). The pounds deducted from the NGOM TAL would be added to the fishery-wide set-asides for research and monitoring. Framework 36 measures would also implement an accountability measure from 2021 triggered by a TAC overage. For FY2023, the NGOM Set-Aside would also be reduced by 17,918 pounds to account for the 2021 overage.

None of the NGOM TAL options of Alternative 2 exceed 800,000 pounds; therefore, the remaining TAL after pounds are deducted for research and monitoring are allocated as NGOM Set-Aside for directed LAGC fishing (Table 6). RSA compensation fishing would be allowed in the NGOM, up to the 25,000-pound limit specified in the options of this alternative.

Fishing year 2024 default measures would be set at 75% of the 2023 NGOM Set-Aside value after the AM is accounted for (Table 6). In 2024, the NGOM contribution to the RSA would be 25,000 pounds, and 1% of the NGOM ABC would be 7,932 pounds.

Rationale: Alternative 2 utilizes data from the 2022 scallop surveys and is expected to promote resource conservation by 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 growing 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. While most of the exploitable biomass in the management unit is on Stellwagen Bank, setting the NGOM TAL based on biomass estimates from Stellwagen, Ipswich Bay, and Jeffreys Ledge (Options 3 and 4) reflects the ability for vessels to fish within the entire management unit, and sets harvest limits using the scallop biomass from multiple areas. Options 1 and 2 take a more conservative approach by setting the NGOM TAL based on the area with the highest densities of scallops in the NGOM.

4.2.2.1 Option 1 – Set NGOM TAL at F=0.15 (Stellwagen Only)

The overall NGOM TAL would be set by applying a fishing mortality rate of F=0.15 to the exploitable biomass on Stellwagen Bank only. Under Option 1, the TAL for 2023 would be set at 357,149 pounds, and the NGOM Set-Aside would be set at 303,693 pounds. The 2024 default NGOM Set-Aside would be set at 227,770 pounds.

4.2.2.2 Option 2 – Set NGOM TAL at F=0.18 (Stellwagen Only)

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 2023 would be set at 421,083 pounds, and the NGOM Set-Aside would be set at 367,627 pounds. The 2024 default NGOM Set-Aside would be set at 275,720 pounds.

4.2.2.3 Option 3 – Set NGOM TAL at F=0.15 (Stellwagen Bank, Ipswich Bay, Jeffreys Ledge) (*Preferred*)

The overall NGOM TAL would be set by applying a fishing mortality rate of F=0.15 to the exploitable biomass on Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge. Under Option 3, the TAL for 2023 would be set at 434,311 pounds, and the NGOM Set-Aside would be set at 380,855 pounds. The 2024 default NGOM Set-Aside would be set at 285,641 pounds.

4.2.2.4 Option 4 – Set NGOM TAL at F=0.18 (Stellwagen Bank, Ipswich Bay, Jeffreys Ledge)

The overall NGOM TAL would be set by applying a fishing mortality rate of F=0.18 to the exploitable biomass on Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge. Under Option 4, the TAL for 2023 would be set at 511,472 pounds, and the NGOM Set-Aside would be set at 458,016 pounds. The 2024 default NGOM Set-Aside would be set at 343,512 pounds.

Table 6 - Distribution of the NGOM TAL, set-asides, application of the accountability measure for the 2021 NGOM overage, and default NGOM set-aside (2024) for Alternative 2 Options 1 – 4. Values shown in pounds.

Section	4.2.2.1	4.2.2.2	4.2.2.3	4.2.2.4
	Option 1	Option 2	Option 3	Option 4
Fishing Mortality Rate	F=0.15	F=0.18	F=0.15	F=0.18
Area(s) Fished	Stellwagen	Stellwagen	Stellwagen, Ipswich, Jeffreys	Stellwagen, Ipswich, Jeffreys
2023 Total Allowable Landings	357,149	421,083	434,311	511,472
1% NGOM ABC for Observers	10,538	10,538	10,538	10,538
2023 RSA Contribution	25,000	25,000	25,000	25,000
2021 Overage - Payback	(-17,918)	(-17,918)	(-17,918)	(-17,918)
2023 NGOM Set-Aside	303,693	367,627	380,855	458,016
2024 Default NGOM Set-Aside	227,770	275,720	285,641	343,512

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 for the specification alternatives considered in this action is provided in Table 7.

Table 7 – Comparison of allocations and DAS associated with each specification alternative in Framework 36.

Alternative	Run	Overall F	Open area F	DAS	Annual Projected Landings	APL with Set-Asides removes	LA APL (94.5%)	LAGC APL (5.5%)	LAGC IFQ only (5%)	LA with IFQ (0.5%)
4.3.1	NA	0.183	0.34	18	20,214,185	18,064,942	17,071,370	993,572	903,247	90,325
4.3.2.1	10k 22DAS	0.216	0.46	22	22,619,428	20,470,185	19,344,325	1,125,860	1,023,509	102,351
4.3.2.2	10k 24DAS	0.226	0.51	24	23,719,535	21,570,292	20,383,926	1,186,366	1,078,515	107,851
4.3.3.1	12k 22DAS	0.232	0.46	22	23,909,132	21,759,889	20,563,095	1,196,794	1,087,994	108,799
4.3.3.2 (*Preferred*)	12k 24DAS	0.242	0.51	24	25,007,034	22,857,791	21,600,613	1,257,179	1,142,890	114,289
4.3.4.1	14k 22DAS	0.247	0.46	22	25,207,655	23,058,412	21,790,199	1,268,213	1,152,921	115,292
4.3.4.2	14k 24DAS	0.258	0.51	24	26,305,557	24,156,314	22,827,717	1,328,597	1,207,816	120,782

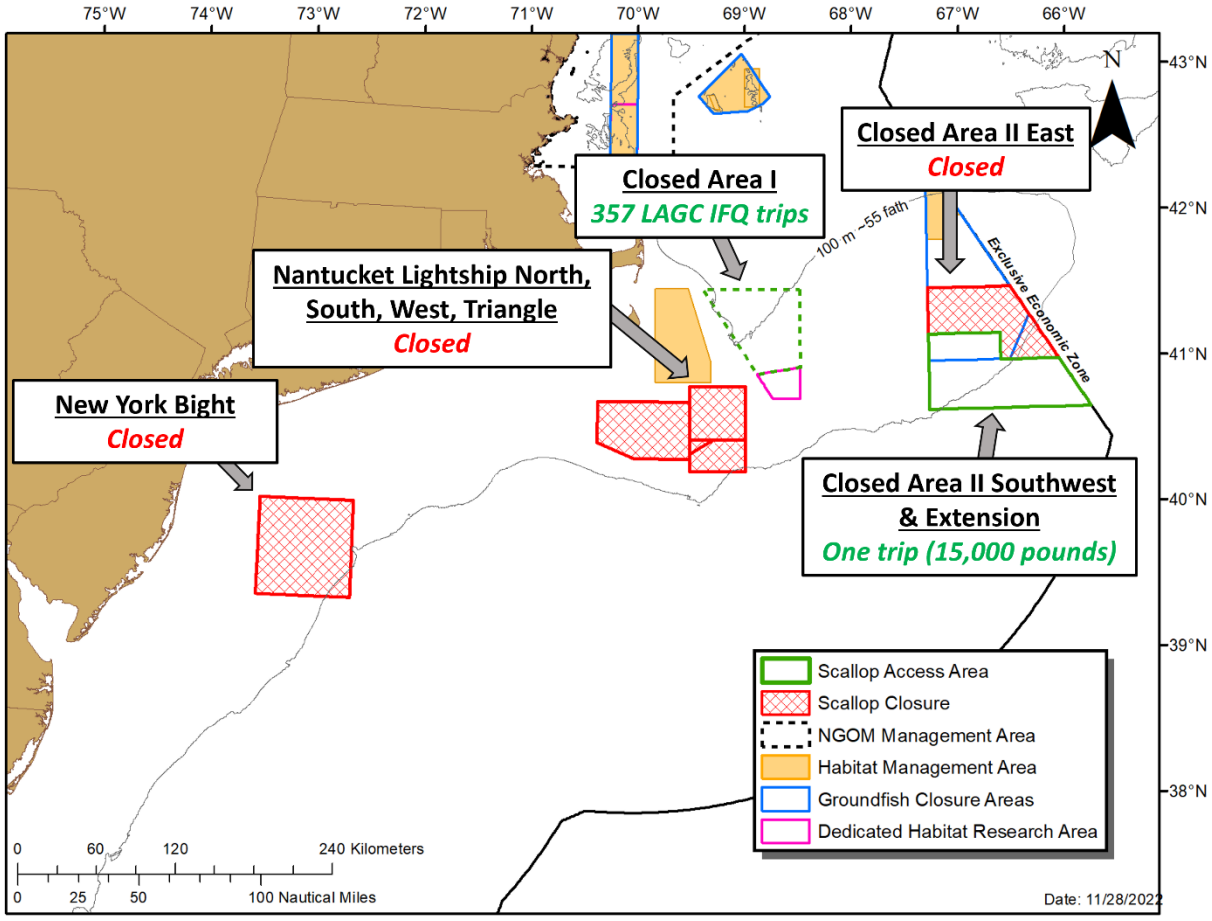
4.3.1 Alternative 1 – No Action (Default Measures)

Under Alternative 1 – No Action, the default specifications approved in Framework 34 would be in place for the 2023 fishing year and there would be no allocations specified for the 2024 fishing year. Default measures approved in Framework 34 include full-time Limited Access DAS set at 18, which would be 75% of the DAS allocated for FY2022. Part-time Limited Access vessels would receive 7.2 DAS, and Occasional Limited Access vessels would be allocated 1.5 DAS. No Action would allocate one 15,000-pound full-time Limited Access trip to Closed Area II (CAII SW and EXT) in FY2023.

Under the FW34 default measures for FY2023, the total LAGC IFQ allocation would be 1,295,996 pounds, which is equivalent to 75% of the total LAGC IFQ allocation for FY2022. No Action would allocate 357 LAGC IFQ access area trips to Closed Area I for FY2023.

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 – Two access area trips in Area II with 10,000-pound trip limit

Alternative 2 would allocate two (2) full-time limited access vessels access area trips to Area II (i.e., formerly "Closed Area II) with a possession limit of 10,000 pounds (Map 3). The total Area II access area allocation would be 20,000 pounds per full-time limited access vessel. The Area II boundary would be expanded compared to the configuration used for Closed Area II in FY2022 (see Alternative 1) to include Closed Area II Southwest, Closed Area II Extension, and Closed Area II East (Map 4). Coordinates of the Area II boundary under this alternative are provided in Map 4.

Alternative 2 would close the following areas for the entirety of FY2023: Area I (i.e., formerly "Closed Area I"), the Nantucket Lightship West, the New York Bight, and the Elephant Trunk. Coordinates for these closure areas are provided in Map 5. The New York Bight closure would be no transit.

Under Alternative 2, the Nantucket Lightship South would remain an access area for the first 60 days of FY2023 (i.e., through May 30, 2023) to allow limited access vessels to fish their remaining FY2022 access area allocations to this area. On May 31, 2023, the Nantucket Lightship South and Nantucket Lightship Triangle would revert to open bottom and would be accessible to limited access vessels fishing open area days-at-sea and LAGC IFQ vessels fishing open trips. The Nantucket Lightship North would revert to open bottom, with the timing of the opening dependent on the alternative selected in Section 4.4 (Access Area Trip Allocations to the LAGC IFQ Component).

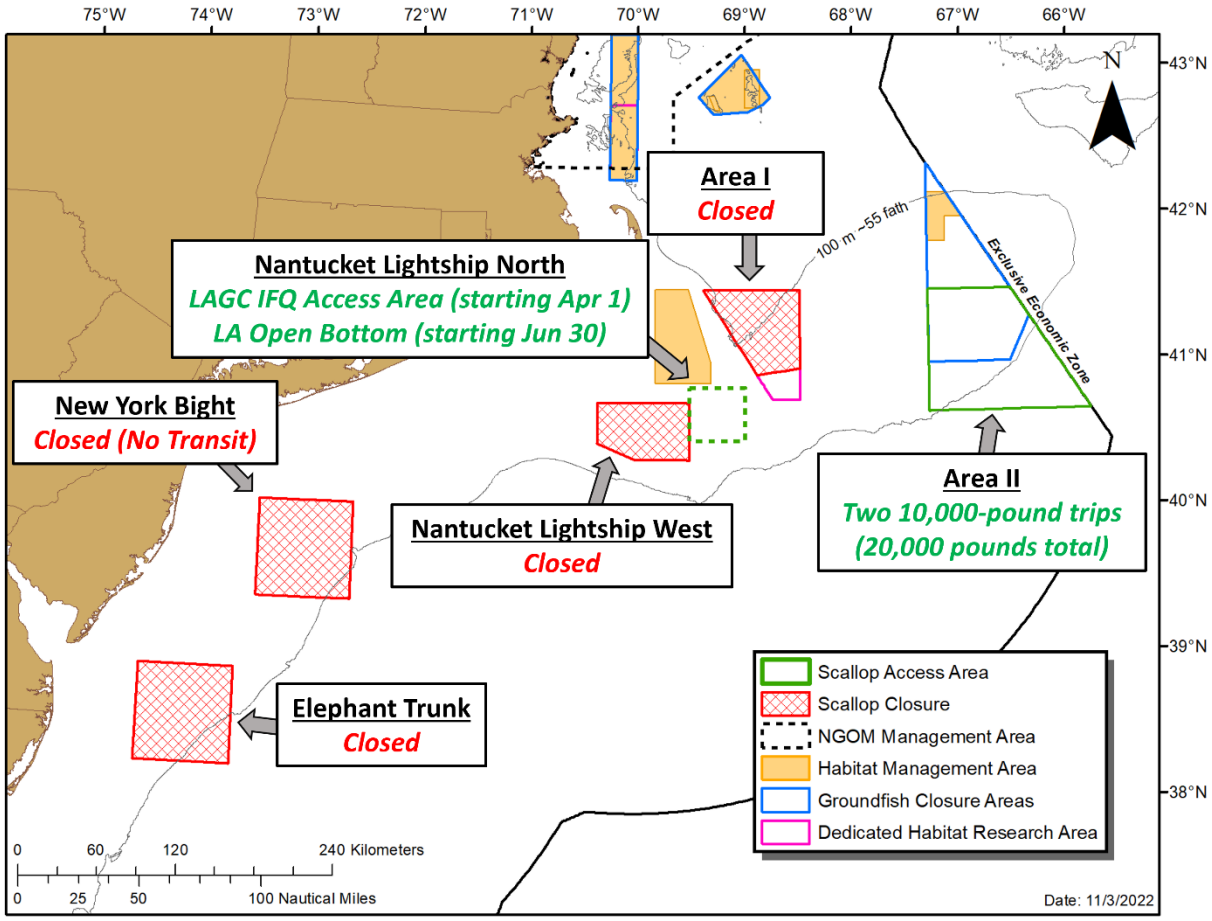
The specific allocations associated with Alternative 2 include:

- The FY2023 Annual Projected Landings (APL) for this alternative are 22.6 million pounds (open area F=0.46, 22 DAS), or 23.7 million pounds (open area F=0.51, 24 DAS) before set-asides are accounted for (i.e., RSA, observer, NGOM). The Research Set-Aside, Observer Set-Aside, and incidental catch total for 2023 is 800 mt or 1.76 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 20,000 Area II access area pounds and the trip limit would be set at 10,000 pounds per trip.
- Access area allocations would be set at 8,000 pounds for part time (PT) limited access vessels and 1,670 pounds for occasional limited access vessels. The LA PT trip limit would be set at 8,000 pounds and PT vessels would receive one trip to Area II. The occasional LA trip limit would be set at 1,670 pounds and occasional vessels would be able to fish their allocation in Area II.
- 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 36 for FY2023 and the first 60 days of FY2024, even if the area is scheduled to close in FY2024 (Map 4). Vessels planning to fish FY2023 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, 2024.
- Research Set-Aside (RSA) compensation fishing would be allowed only in the open area under this alternative, though the Council could elect to allow LAGC IFQ vessels to fish RSA compensation in the NLS-North during the first 90 days of the fishing year under the action alternative being considered in Section 4.4. As stated in Section 4.2, RSA compensation fishing would be allowed in the NGOM, up to the 25,000- pound limit specified in the options of this alternative.
- FY2024 default measures under Alternative 2 would allocate 75% of FY2023 days at sea for the limited access component and 75% of FY2023 quota allocations to the LAGC IFQ component. No default access area trips would be allocated for FY2024 under this alternative.

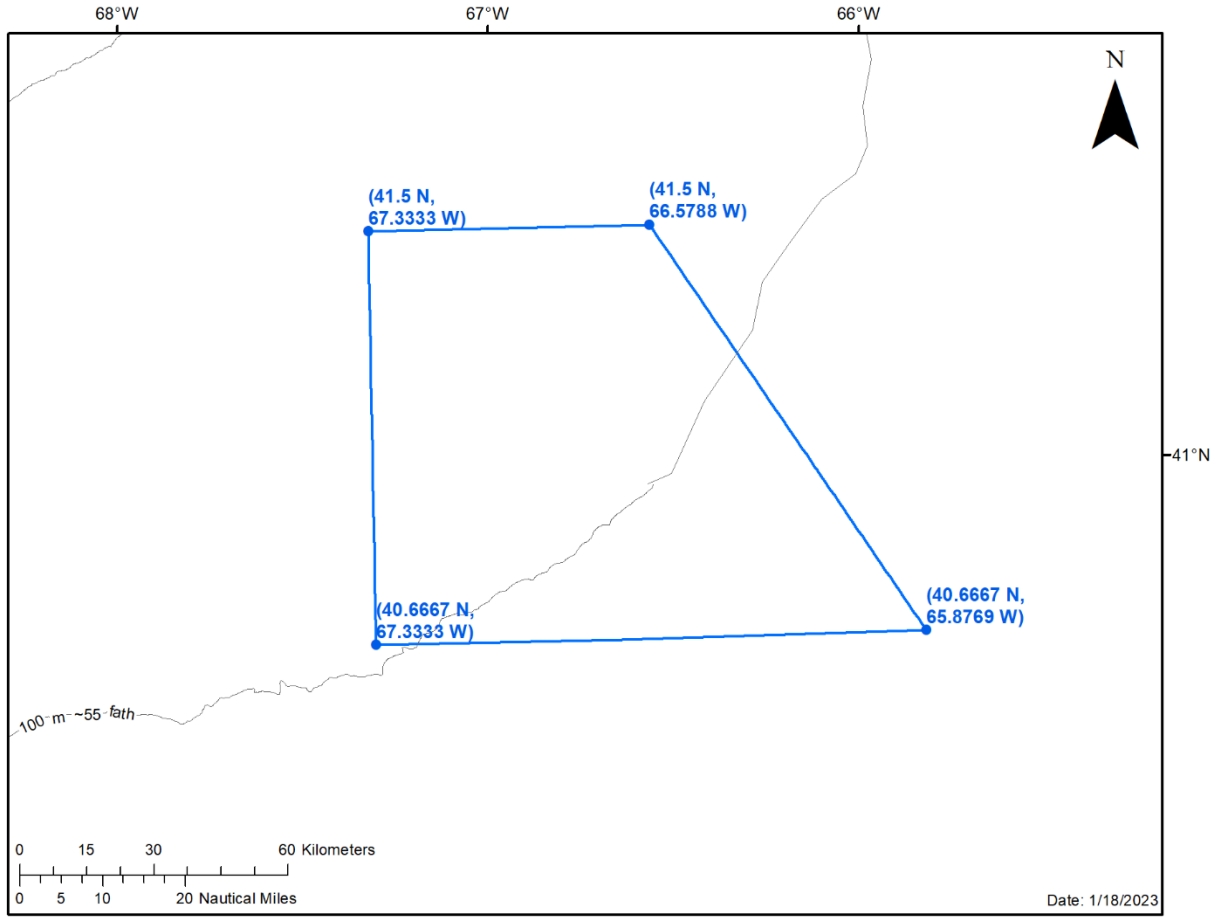
Rationale: The rationale for Alternative 2, Alternative 3, and Alternative 4 is similar given the small difference in specifications under each option. Alternative 2, with the lowest trip limit and landings from

Area II, has higher odds of supporting a rotational fishing trip to the region in 2024. Please refer to the Council's preferred alternative, Alternative 3, in Section 4.3.3 for the complete rationale.

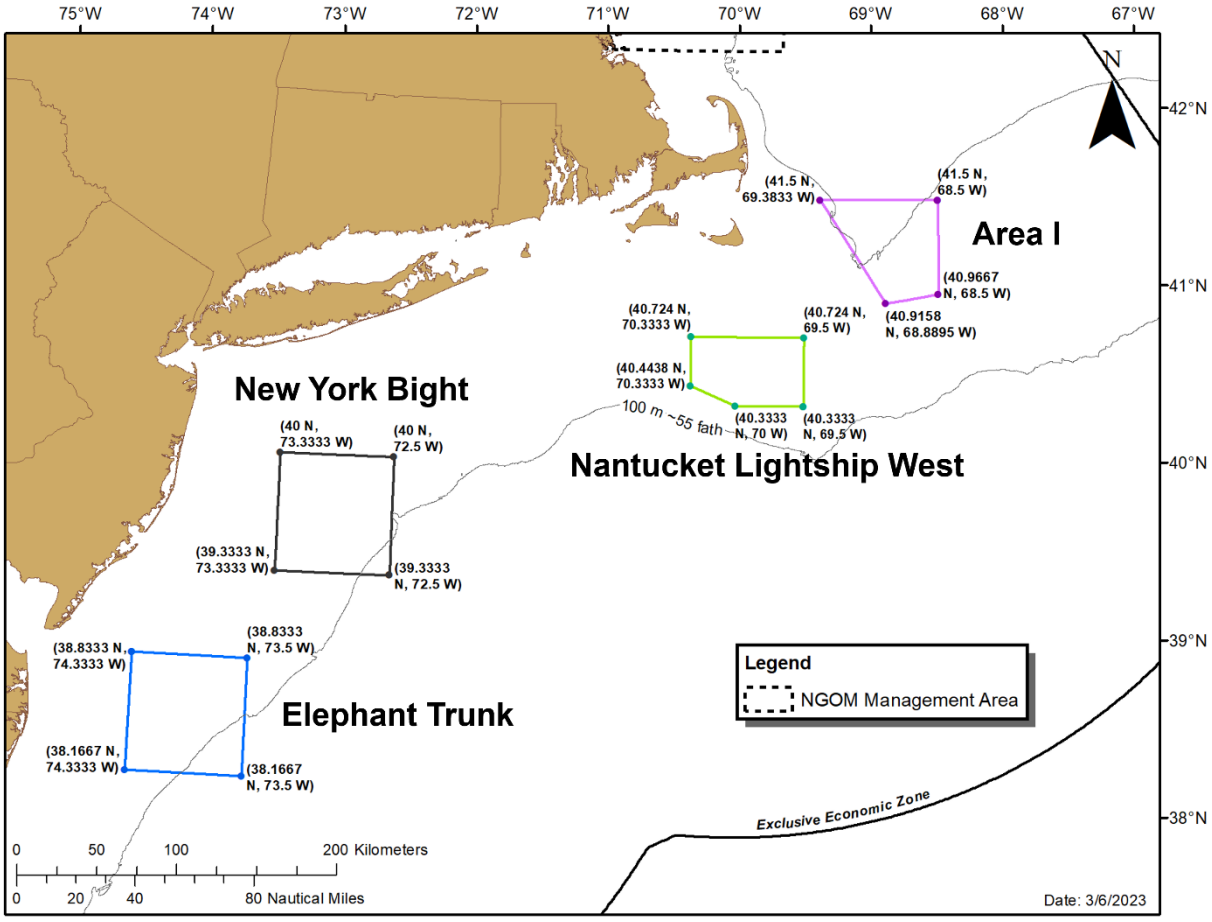
Map 3 – Spatial management under Alternative 2.



Map 4 – Coordinates of the Area II Access Area under Alternative 2, Alternative 3, and Alternative 4.



Map 5 – Coordinates of the scallop closures being considered under Alternative 2, Alternative 3, and Alternative 4. Note that the New York Bight would be no transit.



4.3.2.1 Option 1 – Open Areas Fished at F=0.46 (22 DAS)

Option 1 would allocate 22 days at sea to full time limited access vessels which is expected to result in an average open area fishing mortality rate of F=0.46. The specific allocations associated with Alternative 2 Option 1 include:

- The APL after set-asides are removed would be 20,470,185 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,125,860 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,023,509 pounds. The FY2024 default LAGC IFQ quota (5.5%) would be set at 75% of the FY2023 value, which would be 844,395 pounds.
- FY2023 and FY2024 (default) day at sea allocations for full-time, part-time, and occasional permits under Option 1 are shown in Table 8.

Table 8 – Summary of LA DAS allocations for each permit type at 22 DAS for FT LA vessels.

	FY 2023	FY 2024
FT LA	22	16.5
PT LA	8.8	6.6
Occasional	1.83	1.38

4.3.2.2 Option 2 – Open Areas Fished at F=0.51 (24 DAS)

Option 2 would allocate 24 days at sea to full time limited access vessels which is expected to result in an average open area fishing mortality rate of F=0.51. The specifical allocations associated with Alternative 2 Option 1 include:

- The APL after set-asides are removed would be 21,570,292 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,186,366 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,078,515 pounds. The FY2024 default LAGC IFQ quota (5.5%) would be set at 75% of the FY2023 value, which would be 889,775 pounds.
- FY2023 and FY2024 (default) day at sea allocations for full-time, part-time, and occasional permits under Option 2 are shown in Table 9.

Table 9 – Summary of LA DAS allocations for each permit type at 24 DAS for FT LA vessels.

	FY 2023	FY 2024
FT LA	24	18
PT LA	9.6	7.2
Occasional	2	1.5

4.3.3 Alternative 3 - Two access area trips in Area II with 12,000-pound trip limit (*Preferred Alternative*)

Alternative 3 would allocate two (2) full-time limited access vessels access area trips to Area II (i.e., formerly "Closed Area II") with a possession limit of 12,000 pounds (Map 6). The total Area II access area allocation would be 24,000 pounds per full-time limited access vessel. The Area II boundary would be expanded compared to the configuration used in FY2022 (see Alternative 1) to include Closed Area II Southwest, Closed Area II Extension, and Closed Area II East (Map 6). Coordinates of the Area II boundary under this alternative are provided in Map 4.

Alternative 3 would close the following areas for the entirety of FY2023: Area I (i.e., formerly "Closed Area I"), the Nantucket Lightship West, the New York Bight, and the Elephant Trunk. Coordinates for these closure areas are provided in Map 5. The New York Bight closure would be no transit.

Under Alternative 3, the Nantucket Lightship South would remain an access area for the first 60 days of FY2023 (i.e., through May 30, 2023) to allow limited access vessels to fish remaining FY2022 access area allocations to this area. On May 31, 2023, the Nantucket Lightship South and Nantucket Lightship Triangle would revert to open bottom and would be accessible to limited access vessels fishing open area

days-at-sea and LAGC IFQ vessels fishing open trips. The Nantucket Lightship North would revert to open bottom, with the timing of the opening dependent on the alternative selected in Section 4.4 (Access Area Trip Allocations to the LAGC IFQ Component).

The specific allocations associated with Alternative 3 include:

- The FY2023 Annual Projected Landings (APL) for this alternative are 23.9 million pounds (open area F=0.46, 22 DAS), or 25.0 million pounds (open area F=0.51, 24 DAS) before set-asides are accounted for (i.e., RSA, observer, NGOM). The Research Set-Aside, Observer Set-Aside, and incidental catch total for 2023 is 800 mt or 1.76 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 24,000 Area II access area pounds and the trip limit would be set at 12,000 pounds per trip.
- Access area allocations would be set at 9,600 pounds for part time (PT) limited access vessels and 2,000 pounds for occasional limited access vessels. The LA PT trip limit would be set at 9,600 pounds and PT vessels would receive one trip to Area II. The occasional LA trip limit would be set at 2,000 pounds and occasional vessels would be able to fish their allocation in Area II.
- 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 FY2023 and the first 60 days of FY2024, even if the area is scheduled to close in FY2024 (Map 4). Vessels planning to fish FY2023 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, 2024.
- Research Set-Aside (RSA) compensation fishing would be allowed only in the open area under this alternative, though the Council could elect to allow LAGC IFQ vessels to fish RSA compensation in the NLS-North during the first 90 days of the fishing year under the action alternative being considered in Section 4.4. As stated in Section 4.2, RSA compensation fishing would be allowed in the NGOM, up to the 25,000- pound limit specified in the options of this alternative.
- FY2024 default measures under Alternative 3 would allocate 75% of FY2023 days at sea for the limited access component and 75% of FY2023 quota allocations to the LAGC IFQ component. No default access area trips would be allocated for FY2024 under this alternative.

Rationale: Focusing access area effort in Area II is in response to this region containing the highest level of exploitable biomass in 2022. Expanding the Area II boundary to include Closed Area II East will allow the fishery to target exploitable biomass that has been in a rotational closure since FY2021 and to spread effort out across a larger area compared to the configuration employed by the Council in FY2021 and FY2022. The majority of scallops in Area II Access Area are exploitable and are supporting access area fishing in the current fishing year (i.e., FY2022).

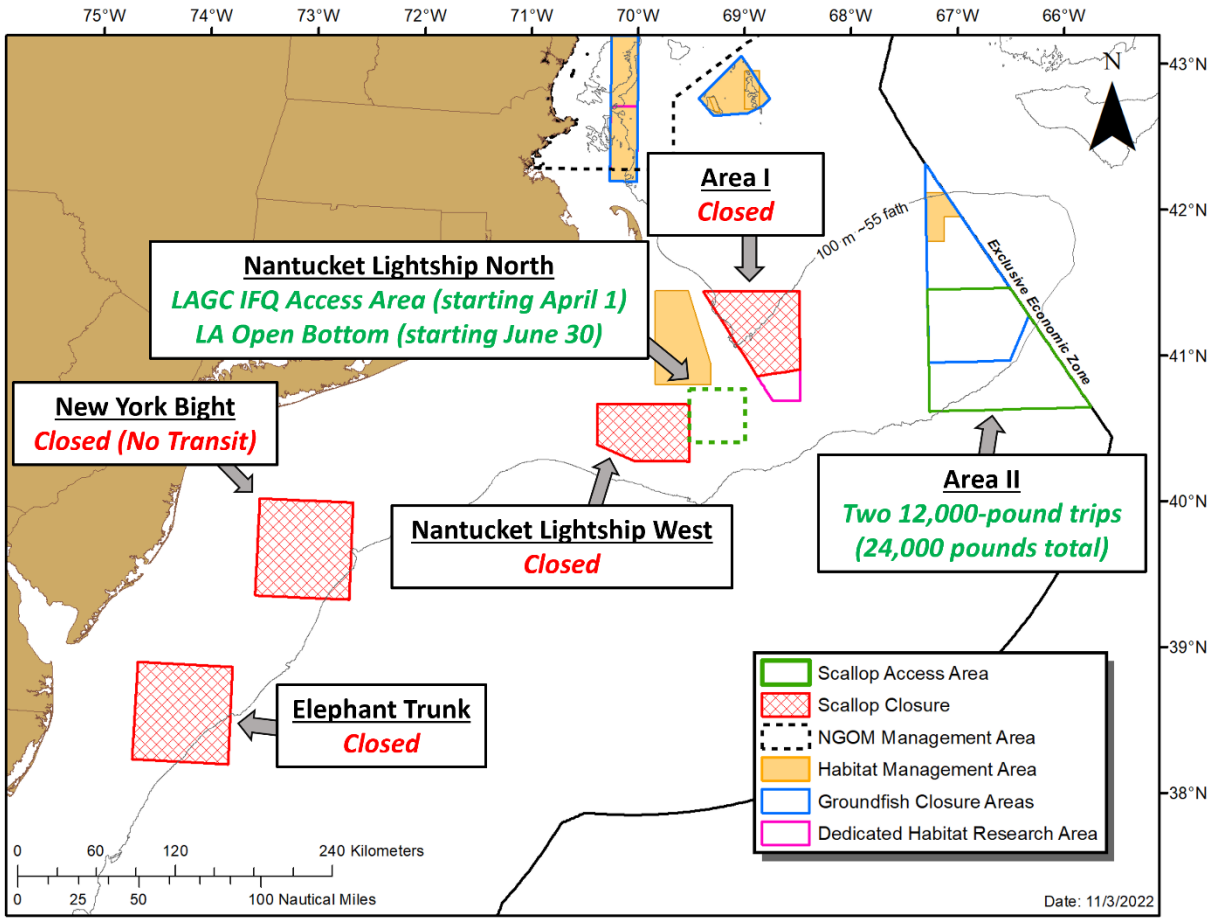
Closures of Area I, the Elephant Trunk, and continued closures of the New York Bight and Nantucket Lightship West, are anticipated to optimize growth of juvenile scallops with the expectation of supporting scallop fishing in the future.

The 2022 surveys of the Nantucket Lightship South observed a substantial drop in biomass and reports from industry members suggested that catch rates in this area became too low to be viable in May of 2022. A large portion of FY2022 access area allocations to the Nantucket Lightship South has not been landed as a result of the downturn biomass in this area early in FY2022. Maintaining the Nantucket Lightship South access area boundary for the first 60 days of FY2023 will allow vessels with remaining FY2022 allocation to fish in this area if they elect to do so, before the area is reverted to open bottom. Given the low biomass in this area, reverting the NLS-South to open bottom is consistent with the principles the of rotational management system employed by the Council.

The Nantucket Lightship Triangle is a small area established by the Council in FY2020 that could be used for research purposes. Reverting the NLS-Triangle to open bottom after the first 60 days of FY2023 will allow for limited access vessels fishing days at sea and LAGC IFQ vessels fishing open trips to target the biomass in this area and is also expected to spread out open area in general. Reverting the area to open bottom after the first 60 days of FY2023 will align with the time of year when meat yield is at its peak. Given that fishing in either the NLS-South and NLS-Triangle could be expected to occur on the shared boundary of both areas, reverting the NLS-Triangle and NLS-South to open bottom on the same schedule (i.e., after the first 60 days of FY2023) avoids a situation where vessels could be fishing a small area of open bottom (i.e., NLS-Triangle) directly adjacent to vessels fishing access area allocations (i.e., NLS-South).

The Nantucket Lightship North has traditionally been a productive area that has been accessed by the scallop fishery only through the rotational management program. While some larger scallops were observed in the NLS-North in the 2022 surveys, little to no recruitment has been observed in this area for the past several years and there is not enough biomass to support equitable access by the fishery through the rotational management program. Reverting the NLS-North to open bottom will allow fishermen to target the larger scallops that persist in this area on open trips if they so choose and is expected to spread open area effort out in general.

Map 6 – Spatial management under Alternative 3.



4.3.3.1 Option 1 – Open Areas Fished at F=0.46 (22 DAS)

Option 1 would allocate 22 days at sea to full time limited access vessels which is expected to result in an average open area fishing mortality rate of F=0.46. The specifical allocations associated with Alternative 2 Option 1 include:

- The APL after set-asides are removed would be 21,759,889 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,196,794 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,087,994 pounds. The FY2024 default LAGC IFQ quota (5.5%) would be set at 75% of the FY2023 value, which would be 897,595 pounds.
- FY2023 and FY2024 (default) day at sea allocations for full-time, part-time, and occasional permits under Option 1 are shown in Table 8.

4.3.3.2 Option 2 – Open Areas Fished at F=0.51 (24 DAS) (*Preferred*)

Option 2 would allocate 24 days at sea to full time limited access vessels which is expected to result in an average open area fishing mortality rate of F=0.51. The specifical allocations associated with Alternative 2 Option 1 include:

- The APL after set-asides are removed would be 22,857,791 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,257,179 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,142,890 pounds. The FY2024 default LAGC IFQ quota (5.5%) would be set at 75% of the FY2023 value, which would be 942,884 pounds.
- FY2023 and FY2024 (default) day at sea allocations for full-time, part-time, and occasional permits under Option 2 are shown in Table 9.

4.3.4 Alternative 4 - Two access area trips in Area II with 14,000-pound trip limit

Alternative 4 would allocate two (2) full-time limited access vessels access area trips to Area II (i.e., formerly "Closed Area II) with a possession limit of 14,000 pounds (Map 7). The total Area II access area allocation would be 28,000 pounds per full-time limited access vessel. The Area II boundary would be expanded compared to the configuration used in FY2022 (see Alternative 1) to include Closed Area II Southwest, Closed Area II Extension, and Closed Area II East (Map 4). Coordinates of the Area II boundary under this alternative are provided in Map 4.

Alternative 4 would close the following areas for the entirety of FY2023: Area I (i.e., formerly "Closed Area I"), the Nantucket Lightship West, the New York Bight, and the Elephant Trunk. Coordinates for these closure areas are provided in Map 5. The New York Bight closure would be no transit.

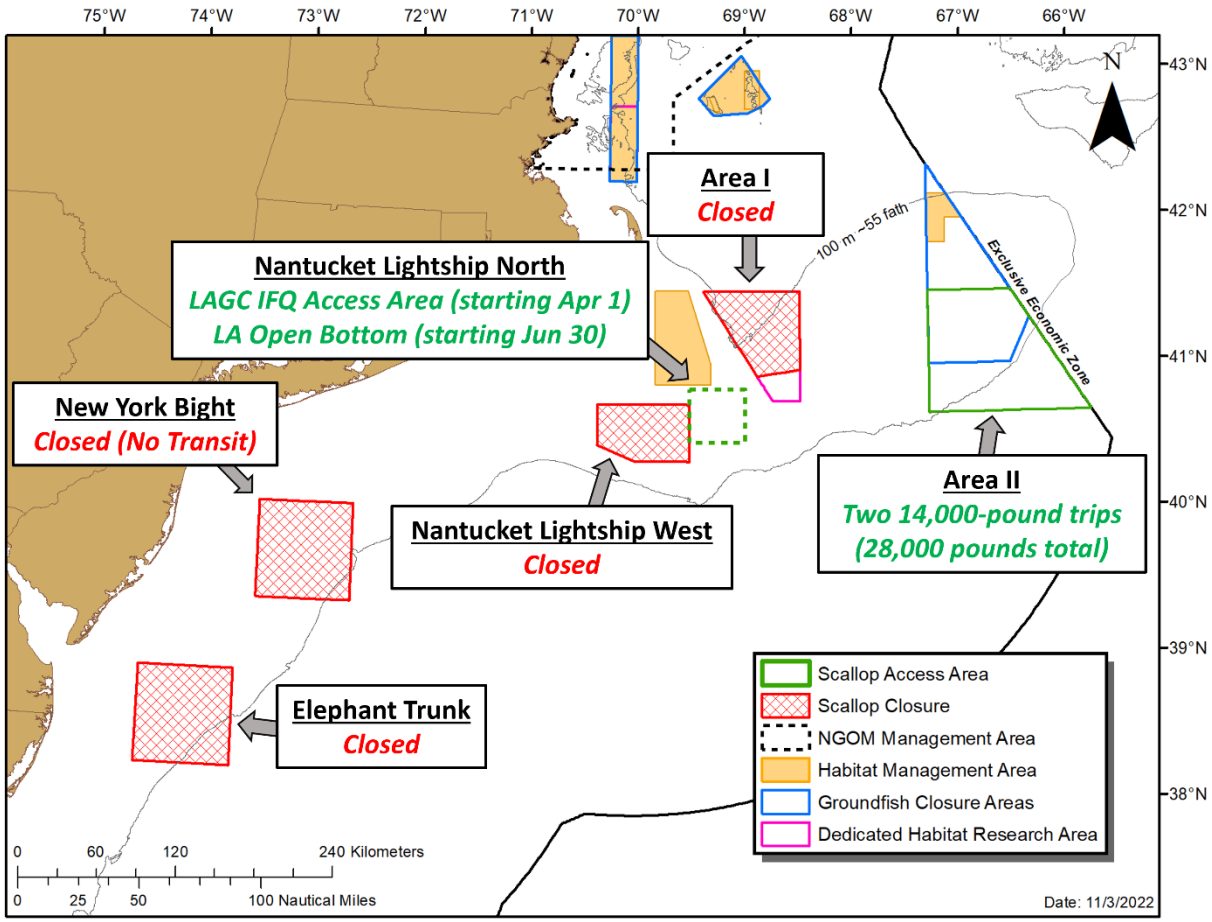
Under Alternative 4, the Nantucket Lightship South would remain an access area for the first 60 days of FY2023 (i.e., through May 30, 2023) to allow limited access vessels to fish remaining FY2022 access area allocations to this area. On May 31, 2023, the Nantucket Lightship South and Nantucket Lightship Triangle would revert to open bottom and would be accessible to limited access vessels fishing open area days-at-sea and LAGC IFQ vessels fishing open trips. The Nantucket Lightship North would revert to open bottom, with the timing of the opening dependent on the alternative selected in Section 4.4 (Access Area Trip Allocations to the LAGC IFQ Component).

The specific allocations associated with Alternative 4 include:

- The FY2023 Annual Projected Landings (APL) for this alternative are 25.2 million pounds (open area F=0.46, 22 DAS), or 26.3 million pounds (open area F=0.51, 24 DAS) before set-asides are accounted for (i.e., RSA, observer, NGOM). The Research Set-Aside, Observer Set-Aside, and incidental catch total for 2023 is 800 mt or 1.76 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 28,000 Area II access area pounds and the trip limit would be set at 14,000 pounds per trip.
- Access area allocations would be set at 11,200 pounds for part time (PT) limited access vessels and 2,340 pounds for occasional limited access vessels. The LA PT trip limit would be set at 11,200 pounds and PT vessels would receive one trip to Area II. The occasional LA trip limit would be set at 2,340 pounds and occasional vessels would be able to fish their allocation in Area II.
- 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 FY2023 and the first 60 days of FY2024, even if the area is scheduled to close in FY2024 (Map 4). Vessels planning to fish FY2023 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, 2024.
- Research Set-Aside (RSA) compensation fishing would be allowed only in the open area under this alternative, though the Council could elect to allow LAGC IFQ vessels to fish RSA compensation in the NLS-North during the first 90 days of the fishing year under the action alternative being considered in Section 4.4. As stated in Section 4.2, RSA compensation fishing would be allowed in the NGOM, up to the 25,000- pound limit specified in the options of this alternative.
- FY2024 default measures under Alternative 3 would allocate 75% of FY2023 days at sea for the limited access component and 75% of FY2023 quota allocations to the LAGC IFQ component. No default access area trips would be allocated for FY2024 under this alternative.

Rationale: The rationale for Alternative 4, Alternative 3, and Alternative 2 is similar given the small differences in specifications under each option. Alternative 4, with the highest trip limit and landings from Area II, has lower odds of supporting a rotational fishing trip to the region in 2024, but would result in higher landings in FY2023. Please refer to the rationale for the Council's preferred alternative, Alternative 3, in Section 4.3.3 for the complete rationale.

Map 7 – Spatial management under Alternative 4.



4.3.4.1 Option 1 – Open Areas Fished at F=0.46 (22 DAS)

Option 1 would allocate 22 days at sea to full time limited access vessels which is expected to result in an average open area fishing mortality rate of F=0.46. The specific allocations associated with Alternative 2 Option 1 include:

- The APL after set-asides are removed would be 23,058,412 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,268,213 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,152,921 pounds. The FY2024 default LAGC IFQ quota (5.5%) would be set at 75% of the FY2023 value, which would be 951,159 pounds.
- FY2023 and FY2024 (default) day at sea allocations for full-time, part-time, and occasional permits under Option 1 are shown in Table 8.

4.3.4.2 Option 2 – Open Areas Fished at F=0.51 (24 DAS)

Option 2 would allocate 24 days at sea to full time limited access vessels which is expected to result in an average open area fishing mortality rate of F=0.51. The specific allocations associated with Alternative 2 Option 1 include:

- The APL after set-asides are removed would be 24,156,314 pounds.
- The LAGC IFQ (5.5%) allocation would be 1,328,597 pounds. The LAGC IFQ only (5% of the APL) allocation would be set at 1,207,816 pounds. The FY2024 default LAGC IFQ quota (5.5%) would be set at 75% of the FY2023 value, which would be 996,448 pounds.
- FY2023 and FY2024 (default) day at sea allocations for full-time, part-time, and occasional permits under Option 2 are shown in Table 9.

4.3.5 Alternative 5 – Status Quo

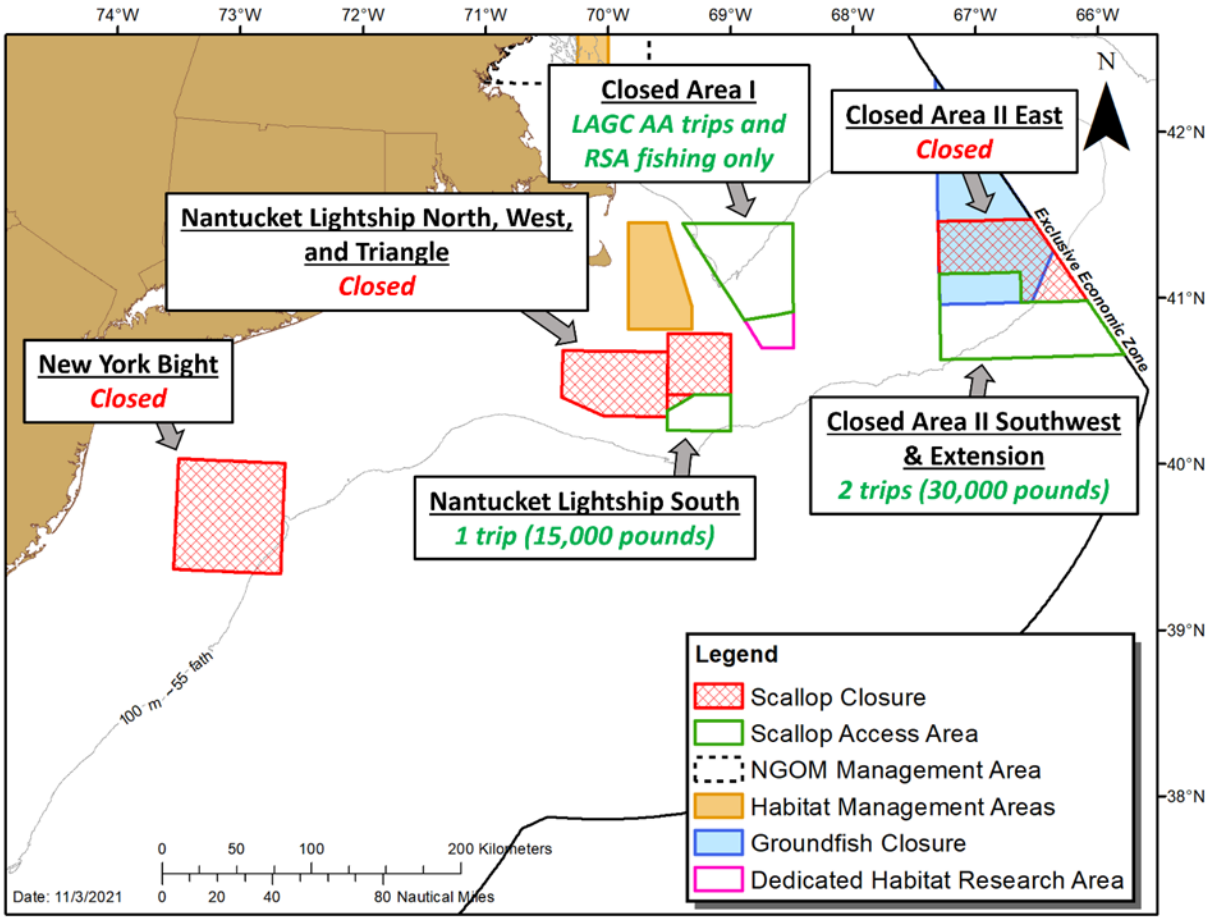
A description of the Framework 34 preferred specification measure is provided in the alternatives section of Framework 36 to provide continuity and context for the reader but is not an option proposed for Council decision. The allocations and spatial management measures that were approved for FY2022 though Framework 34 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 FW34 (i.e., partial allocations).

In Framework 36, the Status Quo run that is presented deviates from the modeling assumptions made in FW34 due to changes in scallop biomass and observations of incoming year classes. Therefore, Status Quo should not be considered an exact comparison to the FY2022 approach to spatial management.

Framework 34 allocated full-time limited access vessels a total access area allocation of 45,000 pounds per vessel and set the access area possession limit at 15,000 pounds per trip. The Council allocated trips to: Closed Area II Access Area (2 FT LA trip) and the Nantucket Lightship South Access Area (1 FT LA trip) (Map 8).

Fishing the open bottom at an F=0.39 with the 2022 spatial management would result in an allocation of 22.7 DAS in FY2023 (vs. 24 DAS in FY2022). Applying status quo spatial management in FY2023 would be expected to result in an APL of 26 million pounds after set asides are removed, which is roughly 16% less than the 31 million pound APL associated with the same spatial management and open area F applied for FY2022.

Map 8 – Status Quo spatial management (FW34 allocations for FY2022).



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

4.4.1 Alternative 1 – No Action (Default measures from FW34)

Alternative 1 would set LAGC IFQ access area trips at 357 trips to Area I with a possession limit of 800-pounds per trip, which is the number of trips specified through default measures in Framework 34. The LAGC IFQ fishery is allocated a fleet wide total number of access area trips and 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 34 specified a set number of LAGC IFQ access area trips in default measures to provide LAGC IFQ vessels fishing opportunities should updated specifications for FY2023 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 Area II Access Area Allocation to the Nantucket Lightship North and Area II (*Preferred Alternative*)

Under Alternative 2, the total number of 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 full time limited access component specified in Section 4.3. Table 10 shows the total number of LAGC IFQ trips that would be allocated based on the FT LA access area trip options being considered for FY2023 (i.e., two 10,000-pound trips per FT LA vessel, two 12,000-pound trips per FT LA vessel, and two 14,000-pound trips per FT LA vessel). Based on the Council's preferred alternative in Section 4.3 (Alternative 4.3.3.2), a total of 571 access area trips would be allocated to the LAGC IFQ component.

Alternative 2 would make the total LAGC IFQ access area trip allocation available in both Area II and the Nantucket Lightship North. There would not be a specific number of trips allocated to Area II or the Nantucket Lightship North, but rather, vessels would be able to fish in either area and trips would be counted against the total trip allocation. Once the total trip allocation is projected to have been taken, both areas would be closed to LAGC IFQ access area fishing for the remainder of the fishing year.

Under Alternative 2, the Nantucket Lightship North would be reserved as an access area for the LAGC IFQ component for the first 90 days of FY2023 (i.e., April 1, 2023 through June 29, 2023). During this time, the only fishing that could occur in the Nantucket Lightship North would be LAGC IFQ vessels fishing access area trips including trips that are fishing Research Set-Aside (RSA) compensation pounds. After the first 90 days of FY2023 (i.e., starting June 30, 2023), the Nantucket Lightship North would become available to the LA component as part of the open bottom and LA vessels could choose to fish there while operating under days at sea management. LAGC IFQ vessels would be able to continue fishing access area trips at an 800-pound possession limit in the Nantucket Lightship North until the total LAGC IFQ access area trip allocation is projected to have been caught. Once the total LAGC IFQ access area trip allocation is projected to have been caught, the Nantucket Lightship North would be considered part of the open bottom for the LAGC IFQ component and vessels could choose to fish open trips in this area at the 600-pound possession limit.

Rationale: Given the outlook for FY2023, access area fishing opportunities for the FT LA component are limited to Area II, which is on eastern Georges Bank. In the past, the Council has distributed the portion of Area II LAGC IFQ access area trips to nearshore areas to provide fishing opportunities to this component of the fishery, which is made up of smaller day-boats. Allowing LAGC IFQ access area trips to be fished in Area II and the Nantucket Lightship North provides access area fishing opportunities in both nearshore and offshore areas, though LAGC IFQ activity in Area II is expected to be minimal given its distance from shore. While biomass in the Nantucket Lightship North is too low to support access area effort by the LA component, larger scallops do exist in this area that could make LAGC IFQ trips viable. Reverting the area to open bottom after the first 90 days of FY2023 would allow LAGC IFQ vessels to fish access area trips at the 800-pound possession limit before the area could be targeted by the LA component of the fishery fishing under days at sea management. This is a unique approach that creates access area fishing opportunities for the LAGC IFQ component should they choose to fish trips in either area and also creates more space for LA vessels fishing under days at sea management once the area reverts to open bottom on June 30, 2023.

Table 10 – The total access area allocation to the LAGC IFQ component under Alternative 2 based on the fishery specification options being considered in Section 4.3.

Specs. Alt.	FT LA AA Description	LAGC Trips to NLS-North/Area II	LAGC Trips to Area I
Alt. 4.3.1	No Action	0	357
Alt. 4.3.2	2 AII trips at 10K	476	0
Alt. 4.3.3 (*Pref.*)	2 AII trips at 12K	571	0
Alt. 4.3.4	2 AII trips at 14K	666	0

4.5 CONSIDERED BUT REJECTED ALTERNATIVES

The following suite of alternatives (Action 5) were added to Framework 36 at the December 1, 2022 Scallop Committee meeting to give the Council an opportunity to choose measures that could reduce scallop fishery bycatch of northern windowpane. On December 7, 2022, the Council elected to move these alternatives to considered but rejected based on the following rationale:

- Based on 2022 in-season catch information, it appears that bycatch was likely overestimated in last year's forecasts.
- This is the first year that accountability measures are in place for a northern windowpane overages, it looks like it may be having an effect. This AM is expected to be in place again next year in Area II.
- Landings from the northern windowpane stock area are likely to decline in FY2023 and the Council's preferred fishery specifications alternative reduces bycatch from Area II.
- It does not appear that bycatch from the scallop fishery could result an ACL overage, and AMs for the groundfish fishery, which has been a point of concern for the Council in the past.
- Northern windowpane will be assessed next year, and more care could be taken to consider appropriate measures (i.e., gear or otherwise) to reduce bycatch as needed in future years after the stock assessment is complete and updated specifications are prepared.

4.5.1 Action 5 – Additional Measures to Reduce Fishery Impacts, Measures to Reduce Northern Windowpane Bycatch on Georges Bank

4.5.1.1 Alternative 1 – No Action

Under No Action, there would be no change to the gear requirements to fish on Georges Bank. Scallop vessels would continue to be able to fish a maximum 7 row apron when open bottom fishing.

With respect to other measures designed to reduce northern windowpane bycatch, the scallop fishery is expected to be subject to the reactive AM for the duration of FY2023 based on an overage of the northern windowpane sub-ACL in FY2021, which would require vessels to use a maximum 5 row apron with 1.5 to 1 average maximum hanging ratio when fishing in Area II Access Area year-round. Vessels could choose to use the 5 row apron and 1.5:1 average maximum hanging ratio when fishing in open areas of Georges Bank but would not be required to do so.

4.5.1.2 Alternative 2 – Create a gear restricted area in open areas of Georges Bank east of 68° 30' W longitude for FY2023

Alternative 2 would implement a gear restricted area (GRA) for a specified period of FY2023 in open areas of Georges Bank east of 68° 30' W longitude, not to exceed one (1) year.

Vessels would be required to use a dredge configuration of a maximum 5 row apron and 1.5 to 1 maximum average hanging ratio for the duration of time specified in Option 1 (4.5.2.1) and Option 2 (4.5.2.2), below. The gear restricted area would apply to all scallop vessels fishing open area trips during this time period, within the boundary shown in Map 9.

Description of the required gear: First, the maximum number of rows allowed in the apron of the topside of the dredge would be five (5) rows. A vessel could fish with fewer rows of rings, but the maximum number of rows would be restricted to five. Second, the maximum hanging ratio for the dredge would be 1.5:1 overall; that is an average of 1.5 meshes per ring for the width of the twine top. The twine top is usually connected to the topside of the dredge frame by several rows of rings called the skirt. Individual meshes of the twine top are connected to each ring across the skirt of the dredge. Some vessels use a hanging ratio of 2:1, which means 2 meshes per ring. Some vessels fish with a lower hanging ratio, and some with a greater ratio of 3:1 or even 5:1. An overall hanging ratio of 1.5:1 means that the twine top is hung alternating 2 meshes per ring and 1 mesh per ring, for an overall average of 1.5 meshes per ring for the entire width of the twine top.

A dredge would be in compliance if the ratio did not exceed 1.5 based on the total number meshes in the twine top (counted at the bottom where the twine top connects to the apron) divided by the total number of rings that the twine top is connected to in the apron. For example, an apron that is 40 rings wide (not including any ring in the side pieces) would only be able to use a twine top with 60 or fewer meshes so that the overall ratio of meshes to rings did not exceed 1.5 (60 meshes/40 rings = 1.5). The regulation would not be based on the number of meshes across the top of the twine top connected to the skirt of the dredge, because some vessels connect the twine top to the frame with chain instead of rings.

Rationale: Projections of scallop fishery bycatch of northern windowpane in FY2023 exceed the sub-ACL for this stock. The majority of bycatch is excepted to occur in open areas of Georges Bank. Implementing a gear restricted area for open area fishing east of 68° 30' W longitude is expected to reduce bycatch of northern windowpane flounder by the scallop fishery in FY2023. The spatial extent of the GRA excludes the Great South Channel based on input from scallop industry members who noted the challenges of using the modified gear in areas with rocky substrate.

4.5.1.2.1 Option 1 – Year-Round Gear Restricted Area in Georges Bank Open Areas east of 68° 30' W longitude

Alternative 2 Option 1 would require all scallop vessels fishing open area trips east of 68° 30' W longitude to use a dredge configuration of a maximum 5 row apron and 1.5 to 1 maximum average hanging ratio for the duration of FY2023 (i.e., April 1, 2023 – March 31, 2024). The gear restricted area would apply to all LA and LAGC IFQ vessels fishing open trips during this time, within the boundary shown in Map 9.

Rationale: Projections of scallop fishery bycatch of northern windowpane in FY2023 exceed the sub-ACL for this stock. The majority of bycatch is excepted to occur in open areas of Georges Bank. Implementing a year-round gear restricted area for open area fishing east of 68° 30' W longitude is expected to reduce bycatch of northern windowpane flounder by the scallop fishery during the entirety of FY2023. Requiring the modified gear year round is anticipated to maximize bycatch savings for northern windowpane flounder.

4.5.1.2.2 Option 2 – Seasonal Gear Restricted Area (February 1 – May 31) in Georges Bank Open Areas

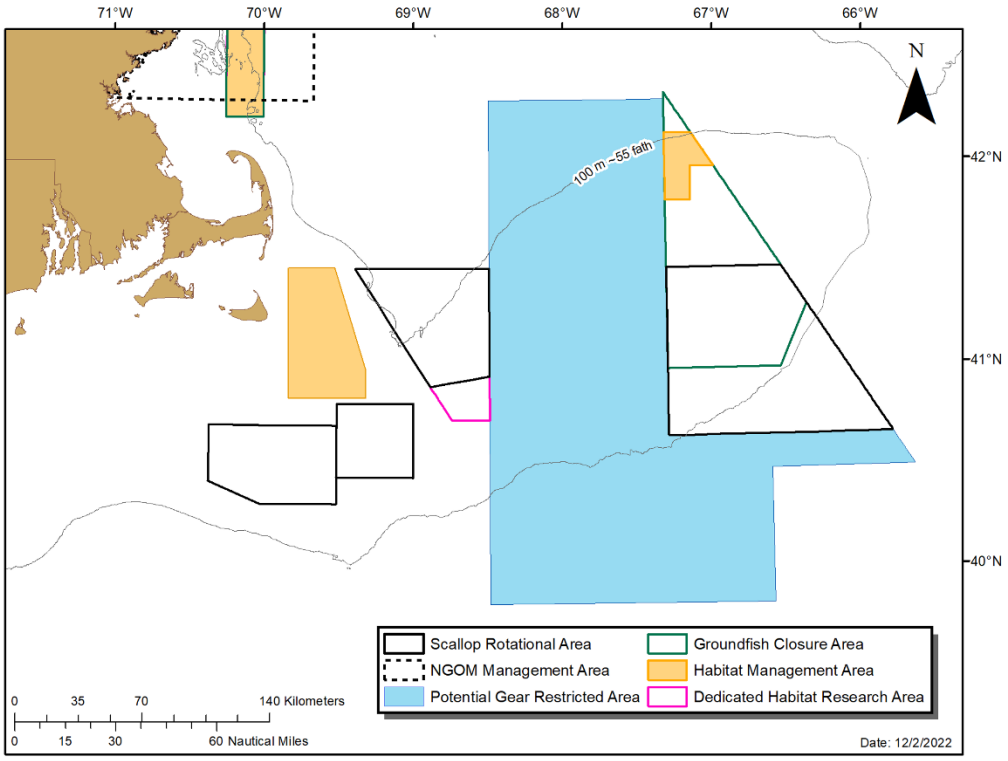
Alternative 2 Option 2 would require all scallop vessels fishing open area trips east of 68° 30' W longitude to use a dredge configuration of a maximum 5 row apron and 1.5 to 1 maximum average hanging ratio from April 1, 2023 – May 31, 2023 and February 1, 2024 – March 31, 2024. The gear restricted area would apply to all LA and LAGC IFQ vessels fishing open trips during this time, within the boundary shown in Map 9.

Rationale: Projections of scallop fishery bycatch of northern windowpane in FY2023 exceed the sub-ACL for this stock. The majority of bycatch is excepted to occur in open areas of Georges Bank. Implementing a seasonal gear restricted area for open area fishing east of 68° 30 W longitude is expected to reduce bycatch of northern windowpane flounder by the scallop fishery in FY2023. The timing of the GRA aligns with the time of year when the scallop fishery and northern windowpane tend to overlap the most.

Table 11. [Table 2 from FW29 Appendix II] GB yellowtail and N. windowpane bycatch savings gained by using a 5-row apron in each month for GB open-area fishing. The percentage of landings from GB open-area fishing in each month is given in the first column. Fishery data used were from 2012-2016.

Month	% landings	GB YT bycatch savings	NWP bycatch savings
April	5.8%	1.5%	9.0%
May	20.4%	9.1%	11.8%
June	29.3%	12.9%	2.8%
July	17.9%	7.0%	3.5%
August	14.5%	1.2%	4.7%
September	7.0%	1.0%	1.7%
October	1.6%	0.3%	0.3%
November	0.4%	0.0%	1.5%
December	0.4%	0.0%	0.0%
January	0.4%	0.0%	0.0%
February	0.3%	0.1%	4.5%
March	2.0%	0.3%	6.2%

Map 9 – Considered but rejected Georges Bank GRA Shown in Blue. GRA would apply in open areas east of 68° 30' W.



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://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2020_scallop_unit_maindoc_rev.pdf

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 scallops from 1975 - 2019

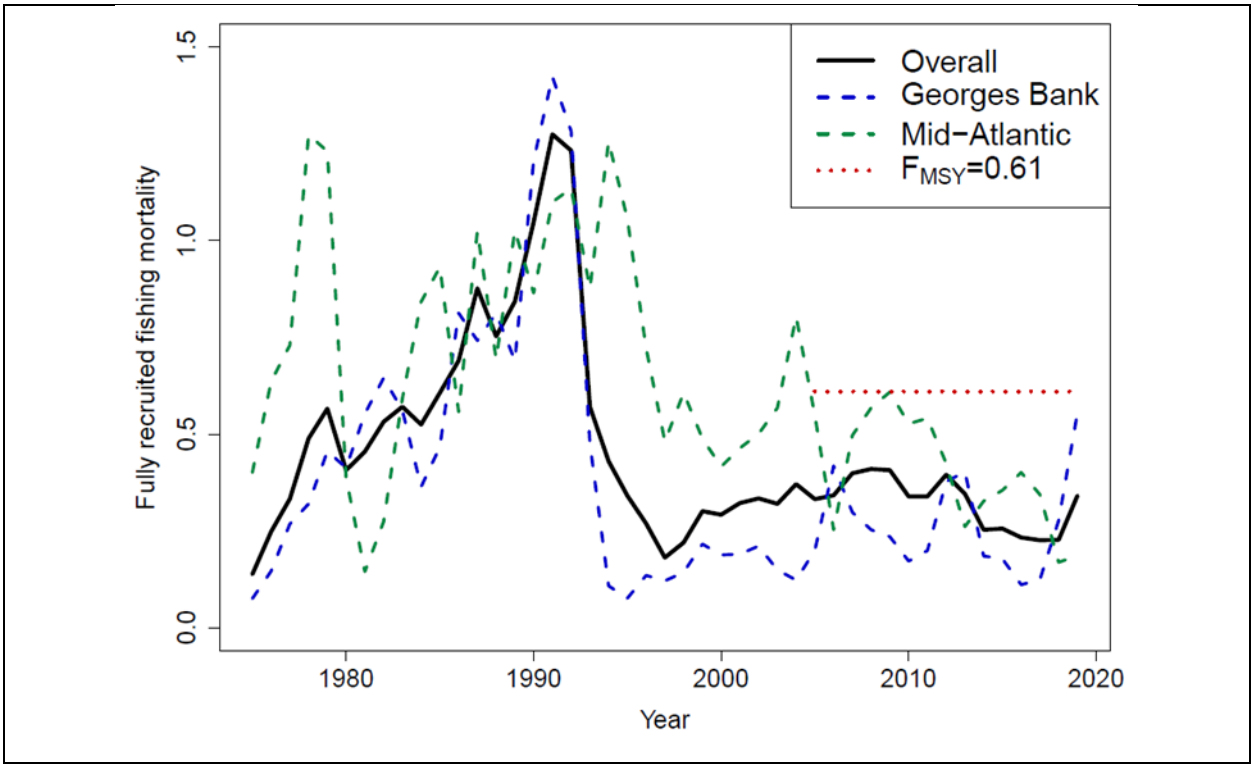


Table 12 – Atlantic sea scallop stock status from recent assessments.

	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

5.2.1.1 Seasonal Meat Yield

Scallop meat yield is known to vary seasonally, corresponding with spawning cycles that can occur twice per year (i.e., in the fall and spring). Scallops typically can lose up to 20% of their meat yield when they spawn (NEFSC 2018). Fishing mortality is correlated with seasonal meat yield trends, particularly in access areas where vessels do not have a time penalty when fishing; for example, vessels fishing during the time of year with low meat yield would need to harvest more scallops compared to when meat yield is high. Seasonal closures that focus access area effort during times of year when meat yield is high were considered during development of FY2023 specifications (i.e., through this action). Part of the rationale for the delayed opening of the Nantucket Lightship North, South, and Triangle under the Council's preferred specification alternative (Alternative 4.3.3) was that the opening would align with the time of year when meat yield is at its peak.

A wide range of studies have focused on meat yield and spawning trends for Atlantic sea scallops. In particular, Appendix II of the 2018 benchmark assessment for scallops (SARC 65, NEFSC 2018) focused on shell height to meat weight relationships and accounted for seasonal meat yield anomalies for the Mid-Atlantic and Georges Bank regions. For Georges Bank and the Mid-Atlantic, meat yield peaked between May and July (Figure 3). Lower meat yields were estimated for both regions in the fall through early spring.

Figure 3 – Mean monthly meat weight anomalies on Georges Bank (left) and Mid-Atlantic (right) open areas from GAM predictions (source: SARC 65 Appendix II).

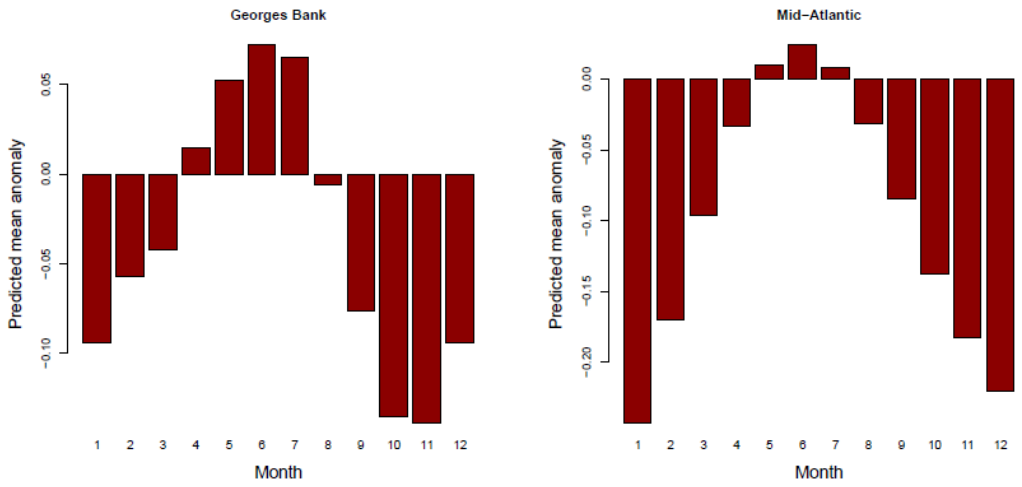


Figure App A2-7: Mean monthly meat weight anomalies on Georges Bank (left) and Mid-Atlantic (right) open areas from GAM predictions.

Hennen and Hart (2012) examined shell height to meat weight relationships and used a GLMM to account for the effect of season on meat yield. The authors noted that meat weights in the MAB were influenced by season. Weights were highest between April and August, and lowest during November to January (Figure 4). On GBK, a bimodal pattern is evident with peaks in December and June, and valleys in April and October.

Figure 4 – Seasonal anomalies in meat weight. The points were fit by a second degree Loess smooth with a 25% span. GBK, Georges Bank; MAB, Mid-Atlantic Bight (source: Hennen and Hart 2012, Fig.7).

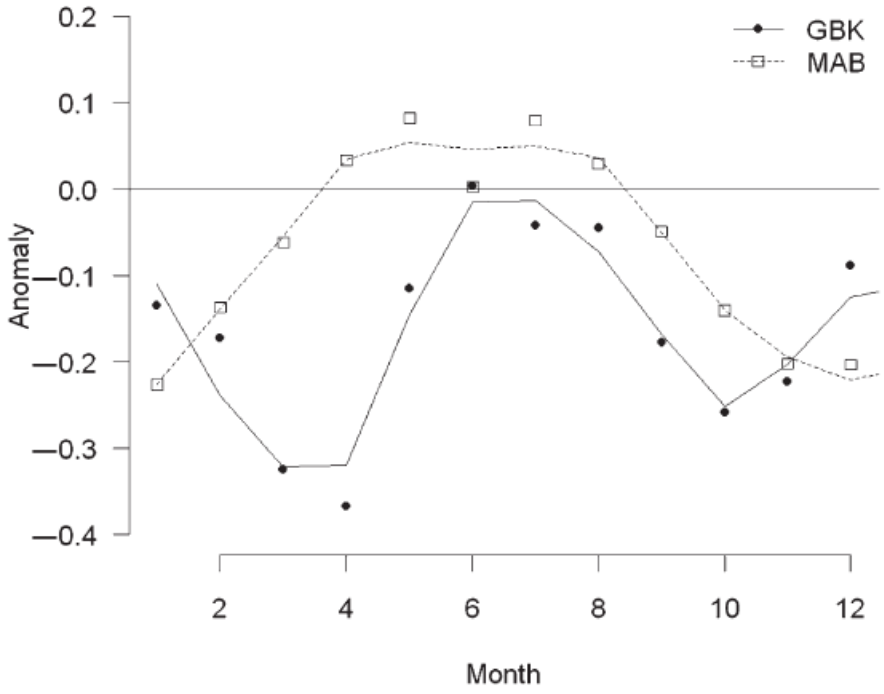


Figure 7. Seasonal anomalies in meat weight. The points were fit by a second-degree Loess smooth with a 25% span. GBK, Georges Bank; MAB, Mid-Atlantic Bight.

Thompson et al. (2014) focusing on identifying spawning events in CAI and CAII by measuring gonadosomatic indices, dry meat yield, and oocyte diameter to gauge spawning intensity. This study indicated a consistent signal in spawning during the study time period (2011, 2012, and 2013) in that scallops tended to spawn in the spring/early summer (April through June), as well as the early fall (October and September) (Figure 5). For both CAI and CAII, meat yield peaked in June throughout the study period, except for in CAI in 2011 which peaked in May.

Figure 5 – Mean dry gonosomatic index (GSI) in Closed Area I (CAI) and CAII in 2011 (A), 2012 (B), and 2013 (C). Vertical lines represent 95th confidence intervals (source: Thompson et al. 2014, Fig.2).

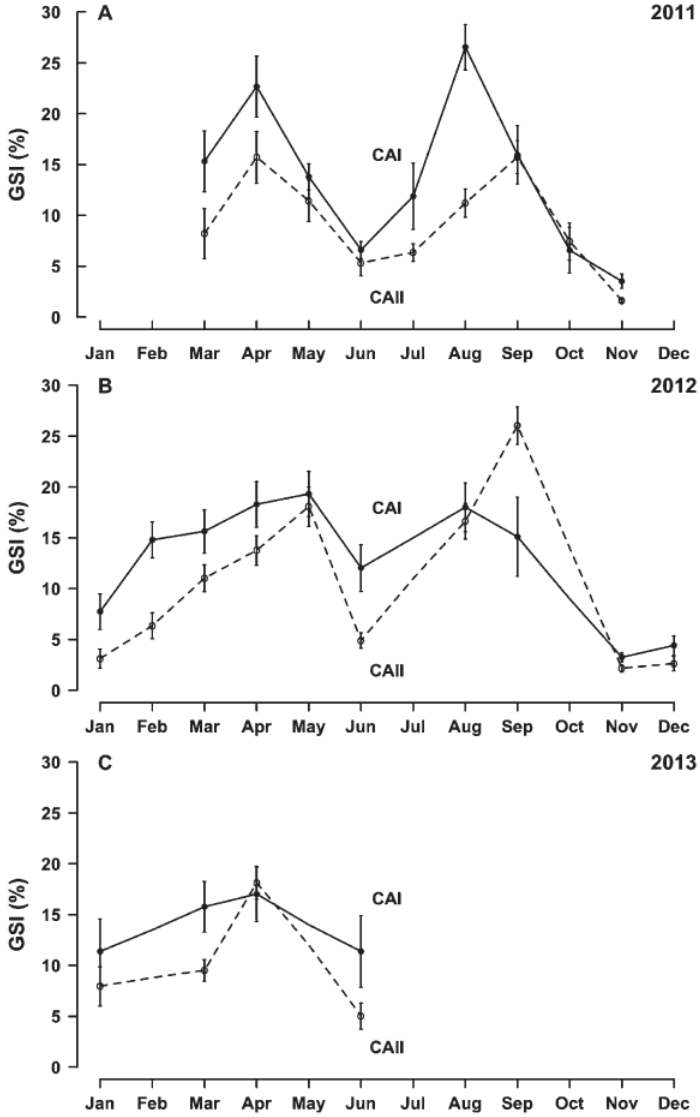


Figure 2. (A–C) Mean dry gonosomatic index (GSI) in Closed Area I (CAI) and CAII in 2011 (A), 2012 (B), and 2013 (C). Vertical lines represent 95% confidence intervals.

Figure 6 – Mean dry meat weight in Closed Area I (CAI) and CAII in 2011 (A), 2012 (B), and 2013 (C). Vertical lines represent 95% confidence interval (source: Thompson et al. 2014, Fig.3).

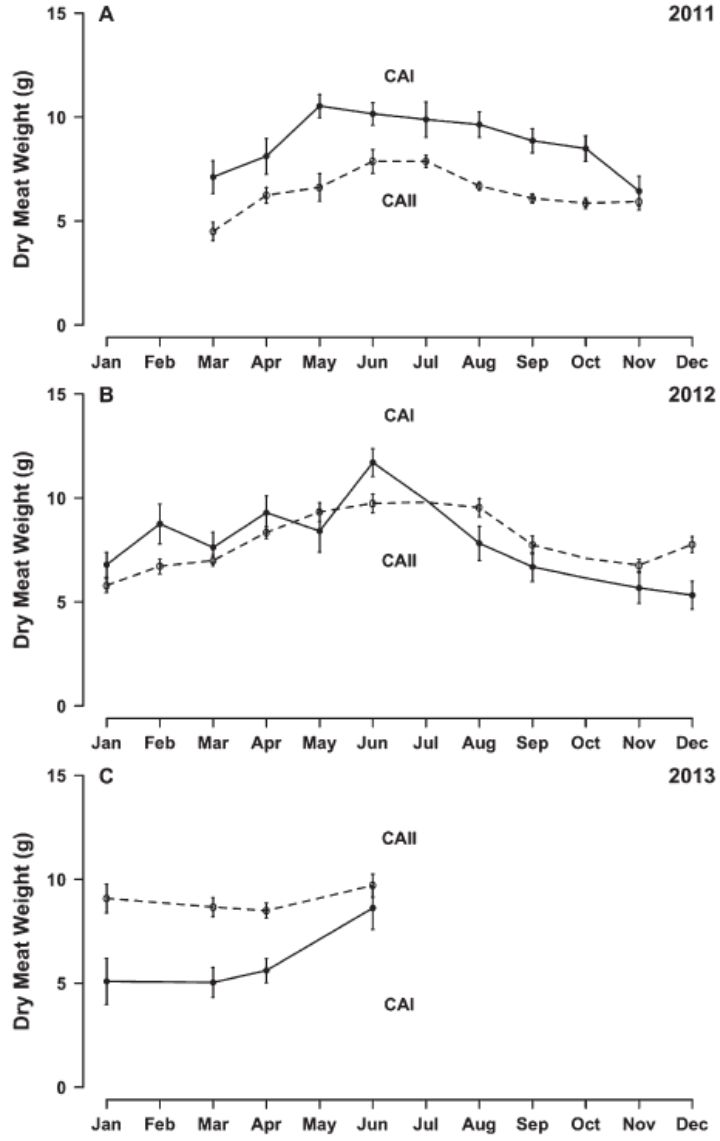


Figure 3. (A–C) Mean dry meat weight in Closed Area I (CAI) and CAII in 2011 (A), 2012 (B), and 2013 (C). Vertical lines represent 95% confidence interval.

5.2.2 Summary of 2022 Scallop Surveys

A summary of findings from the 2022 scallop surveys, including biomass estimates and observations of recruitment, can be found in the following memo to the SSC from October 7, 2022: https://d23h0vhsm26o6d.cloudfront.net/1.3-221007-Memo-PDT-to-SSC-RE-ABC-OFL-2023-2024.pdf

The strongest signal of recruitment observed in the 2022 surveys was in Area I and the Elephant Trunk. The 2022 surveys also observed recruitment in the Nantucket Lightship West, which was closed at the start of FY2022. The New York Bight was closed at the start of FY2022 to allow a large year class of scallops to grow in the absence of scallop fishing. Observations from the 2022 surveys suggest that

scallops in the New York Bight would benefit from a continued closure in FY2023, with the expectation that this area could be accessible to the fishery in FY2024.

Table 13 - 2022 Combined survey abundance and biomass estimates

version 3 - Sept.14, 2022

This version updates the NLS-S using VIMS SHMW from 2016-2022, NYB Closure using VIMS SHMW from 2015-2022, MAB nearshore transcription error, and GOM/NGOM estimates using DMR 2021 SHMW with covariates.

		Dredge				DropCam				Habcam				Mean			
Region	Subarea	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt	Num	Bmsmt	SE	MeanWt
GB	CL1ACC	4	95	90	23.3	37	524	235	14.2	10	215	13	22.1	17	278	84	16.4
GB	CL1-Sliver+S	3302	3955	1422	1.2	932	4876	2526	5.2	373	1578	33	4.2	1536	3470	966	2.3
GB	CL-2(N)	525	11092	4001	21.1	429	9209	2040	21.5	350	6916	175	19.7	435	9072	1498	20.9
GB	CL-2SE	645	11619	813	17.9	466	8131	1047	17.4	842	7631	248	9.1	651	9127	450	14.0
GB	CL-2SW	143	3783	384	26.8	99	2892	483	29.2	150	3105	158	20.7	131	3260	212	24.9
GB	CL2Ext	408	9371	951	23.1	575	9223	1405	16.0	501	7227	242	14.4	495	8607	571	17.4
GB	SF	764	11714	1207	15.4	537	6377	1479	11.9	627	7328	114	11.7	643	8473	637	13.2
GB	NLSAccN	44	857	63	21.8	71	923	606	13.0	65	990	41	15.3	60	923	204	15.4
GB	NLSAccS-Deep	162	2842	365	17.5	226	2973	1123	13.2	115	2043	42	17.7	168	2619	394	15.6
GB	NLS-W	7	293	31	39.1	36	784	356	21.8	8	202	16	24.1	17	426	119	25.1
GB	NF	216	3707	1664	17.1	92	2264	1081	24.6	315	4414	307	14.0	208	3462	669	16.7
GB	GSC	957	4745	557	5.0	597	9081	1256	15.2	411	5368	44	13.1	655	6398	458	9.8
GB	**TOTAL**	**7177**	**64073**	**4942**	**8.9**	**4097**	**57257**	**4537**	**14.0**	**3767**	**47017**	**538**	**12.5**	**5014**	**56116**	**2244**	**11.2**
MAB	BI	29	680	48	23.5					12	316	10	26.2	21	498	25	24.3
MAB	LI	225	5403	280	24.9					250	5764	51	23.1	238	5584	142	23.5
MAB	NYB	91	1183	93	13.2					50	1028	48	20.4	71	1106	52	15.7
MAB	NYB_Closure	423	8626	496	20.4					328	7041	106	21.5	376	7834	254	20.9
MAB	MAB_Nearshore	52	500	98	10.1					24	390	40	16.5	38	445	53	11.7
MAB	HCS	71	1142	97	16.2					49	1009	69	20.6	60	1076	60	17.9
MAB	ET	676	4733	259	6.9					691	4232	45	6.1	684	4483	131	6.6
MAB	DMV	141	756	100	5.6					89	615	8	6.9	115	686	50	6.0
MAB	VIR	69	327	47	4.7									69	327	47	4.7
MAB	**TOTAL**	**1777**	**23350**	**659**	**13.1**					**1493**	**20395**	**157**	**14**	**1670**	**22036**	**341**	**13.2**
GOM	WGOM Closure					62	2111	420	34.0					62	2111	420	34.0
GOM	Stellwagen South					29	373	43	12.9					29	373	43	12.9
GOM	**TOTAL**					**91**	**2484**	**422**	**27.3**					**91**	**2484**	**422**	**27.3**
NGOM	Stellwagen AOI					66	1337	420	20.3					66	1337	420	20.3
NGOM	Jeffreys					9	186	31	21.2					9	186	31	21.2
NGOM	Platts					6	125	35	20.5					6	125	35	20.5
NGOM	Ipswich					10	160	33	16.6					10	160	33	16.6
NGOM	*Total-no Stellwagen*					*25*	*471*	*99*	*58.3*					*25*	*471*	*99*	*58.3*
NGOM	**TOTAL**					**91**	**1808**	**519**	**19.9**					**91**	**1808**	**519**	**19.9**
TOTAL	**TOTAL**	**8954**	**87423**	**4986**	**9.8**	**4279**	**61549**	**4587**	**14.4**	**5260**	**67412**	**561**	**12.8**	**6774**	**79960**	**2328**	**11.8**

Figure 7 – The 2022 Georges Bank SAMS areas used for projections in FW36.

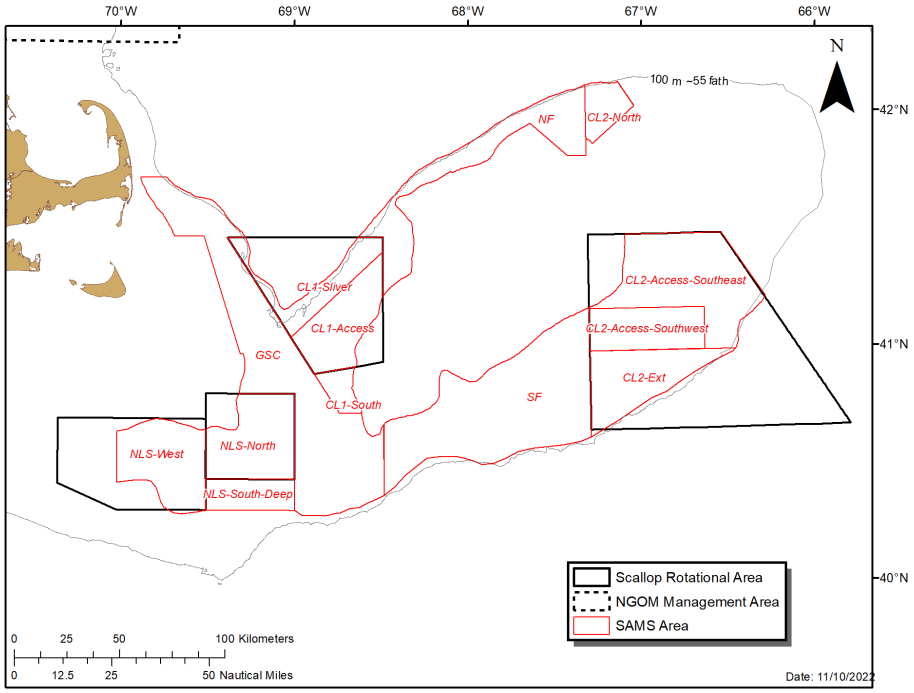
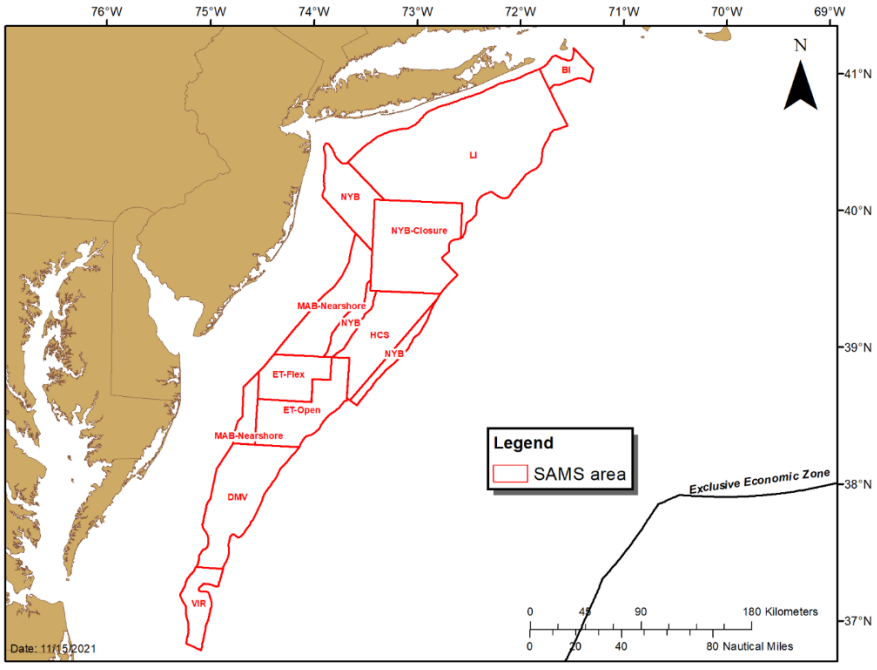


Figure 8 – The 2022 Mid-Atlantic SAMS Areas used for projections in FW36.



5.2.3 2022 Biomass Projections

A description of biomass projections can be found in the October 7, 2022 memo to the SSC at the following link: https://d23h0vhsm26o6d.cloudfront.net/1.3-221007-Memo-PDT-to-SSC-RE-ABC-OFL-2023-2024.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 discarded, 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 14 for the current status of these species, which has been updated based on Northeast Fisheries Science Center (NEFSC) assessment results through 2020[1], the 2020 Skate Annual Monitoring Report, 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 14 – 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	Unknown	Unknown
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

Stock status information also available at the NMFS Stock SMART portal: https://www.st.nmfs.noaa.gov/stocksmart?app=browse-by-stock

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 15 summarizes anticipated catch limits of these four flatfish stocks for FY2023 as well as projected scallop fishery bycatch for FY2023 based on the range of specification alternatives in Action 4 (Section 4.3). More detailed information on bycatch projections are provided in Section 6.3. Table 16 describes a summary of sub-ACLs, projected bycatch, and realized bycatch from the scallop fishery from FY2013 – FY2022, as well as projected bycatch and sub-ACL allocations for FY2023. 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 15 – Comparison of 2023 Scallop Fishery flatfish sub-ACLs (mt) with the range of bycatch projections associated with specification alternatives in Section 4.3.

	OFL	US ABC	Scallop sub-ACL	Bycatch Projections
Stock	**2023**	**2023**	**2023**	**2023**
GB Yellowtail Flounder	unknown	106	16.5	32-45
SNE/MA Yellowtail Flounder	55	40	2	3
Northern Windowpane Flounder	unknown	160	31	106-126
Southern Windowpane Flounder	513	384	129	38-41

Table 16 – 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	29	1	26	123
2022	sub-ACL	19	2	129	33
	Projected	15-19	2-3	73-81	86-111
	Actual	n/a	n/a	n/a	n/a
2023	sub-ACL	16.5	2	129	31
	Projected	32-45	3	38-41	106-126
	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. Some 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 17 to facilitate consideration of the species most likely to interact with the scallop fishery relative to the preferred alternative.

Table 17 – 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	ESA Designated	No
Northwest Atlantic Ocean DPS of Loggerhead Sea Turtle	ESA Designated	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 17, 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[2]. 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; NMFS 2021).

5.4.2 Species Potentially Impacted by the Alternatives Under Consideration

As noted in Table 17, 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

[2] Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region; MMPA List of Fisheries (LOF); NMFS 2021; NMFS Observer Program, unpublished data; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports).

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: 1) 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, or the five listed DPSs of Atlantic sturgeon; and, 2) is not likely to adversely affect designated critical habitat for North Atlantic right whales or loggerhead (Northwest Atlantic Ocean DPS) sea turtles. 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 the NMFS Biological Opinion on the Scallop FMP (NMFS 2021); 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 (NMFS 2021).

- **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 (NEFSC 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.

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).

- **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 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). Subsequently, Linden (2020) partitioned out the sea turtle takes that were estimated to have occurred in trawls catching scallops between 2014-2018 using effort data from Vessel Trip Reports (VTRs) and estimated interaction rates from Murray (2020) (Table 18).

[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).

Table 18 – Estimated sea turtle takes attributed to scallop trawls between 2014–2018. Mean with lower and upper 95% confidence intervals presented for each species (Linden 2020; NMFS 2021).

Sea Turtle Species	Mean	lower	upper
Loggerhead	6.60	1.34	12.83
Kemp's ridley	0.89	0.41	1.51
Leatherback	0.18	0.00	0.43
Green	0.26	0.00	0.76

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), NMFS (2021), 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).

5.5 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

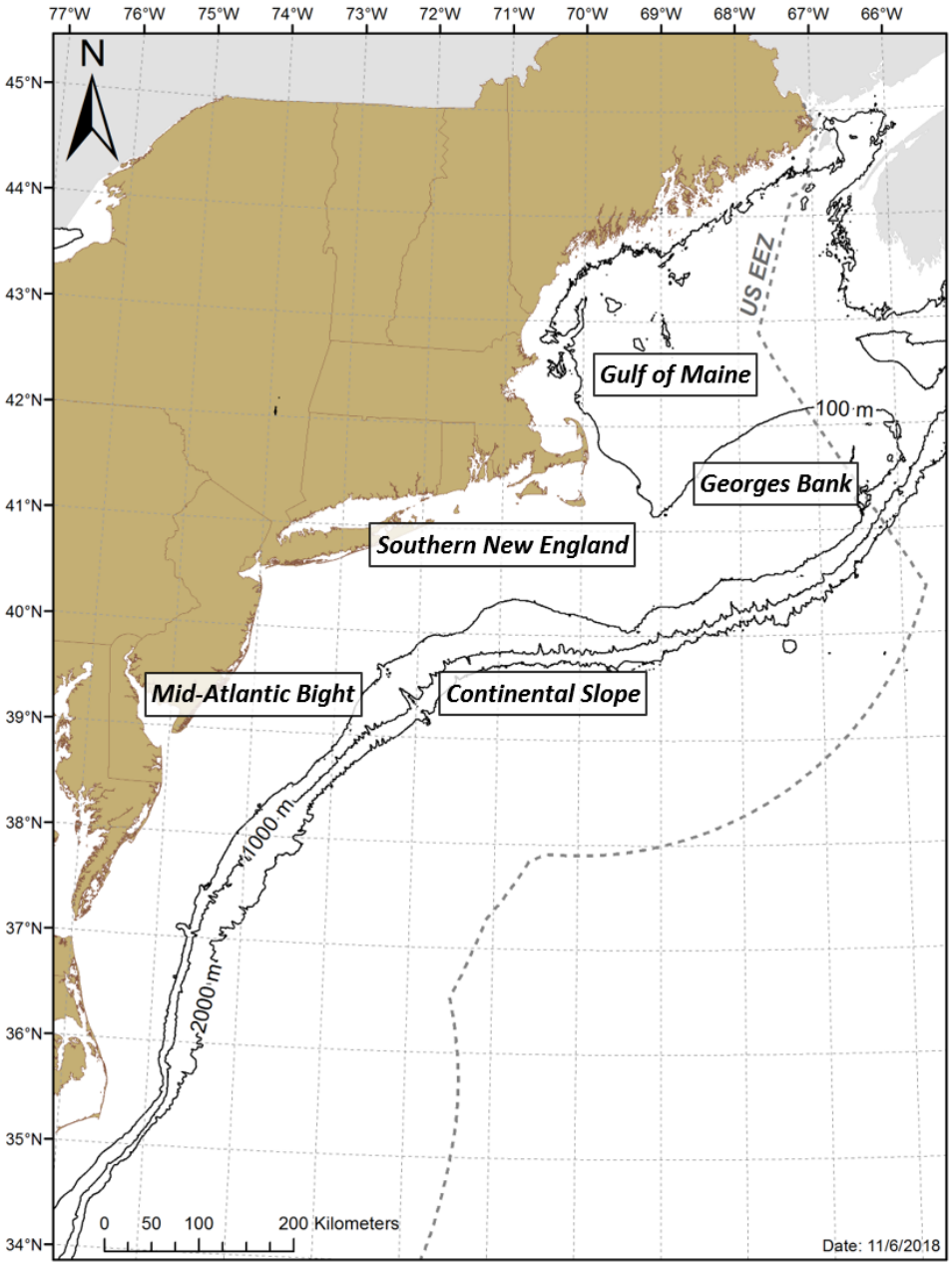
The Northeast U.S. Shelf Ecosystem includes the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream to a depth of 2,000 m (Map 10) (Sherman et al. 1996). Four distinct sub-regions 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 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 surfclam, Atlantic wolfish, barndoor skate, black sea bass, clearnose skate, haddock, little skate, longfin squid, monkfish, ocean pout, ocean quahog, pollock, red hake, redfish, rosette skate, scup, silver hake, spiny dogfish, summer flounder, thorny skate, white hake, windowpane flounder, winter flounder, witch flounder, winter skate, and yellowtail flounder. EFH designations for NEFMC-managed species are provided here: https://d23h0vhsm26o6d.cloudfront.net/NEFMC_EFH_Designations.pdf. Table 19 describes information on the geographic area, depth, and EFH description MAFMC-managed species.

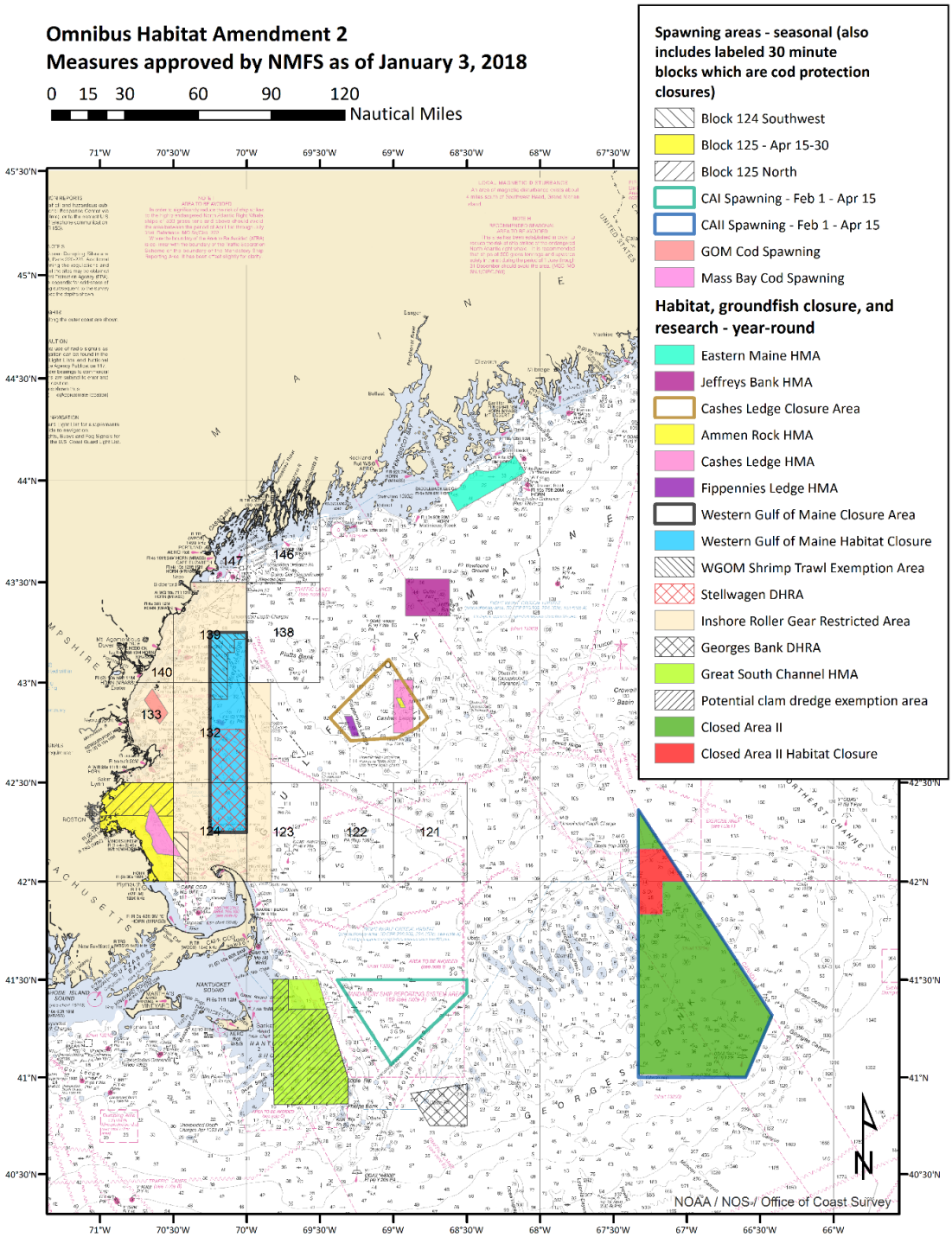
Another purpose of OHA2 was to evaluate existing habitat management areas and develop new habitat management areas. To assist with this effort, an analytical approach was developed to characterize and map habitats and to assess the extent to which different habitat types are vulnerable to different types 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. The model has since been updated and is referred to as the Fishing Effects model. More information is available here: https://www.nefmc.org/library/fishing-effects-model. A final decision regarding OHA2 was published by the NMFS on January 3, 2018, with implementation

of the amendment on April 9, 2018. Map 11 shows the approved habitat management areas and seasonal spawning areas. For more detailed descriptions of the approved OHA2 areas the reader is referred to the Council website (OHA2 FEIS, Vol. 2).

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



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 19 – Geographic distributions and habitat characteristics of Essential Fish Habitat designations for benthic fish and shellfish species managed by the 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
Atlantic surfclam	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
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
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
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
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
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
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
* 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.				

5.6 HUMAN COMMUNITIES

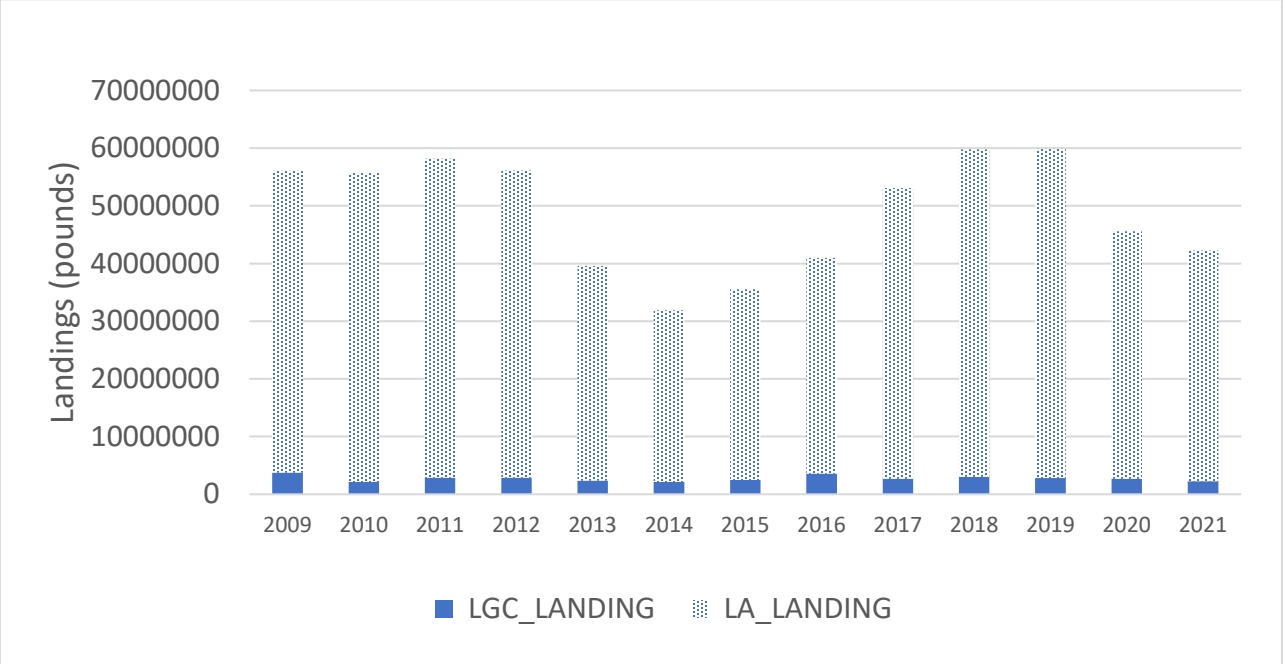
5.6.1 Economic Trends in the Sea Scallop Fishery

5.6.1.1 Trends in landings, prices and revenues

During fishing years 2009-2021, scallop landings ranged from about 32 to 60 million pounds. In FY2021, the total scallop landings from all permit categories decreased to about 42.25 million pounds, i.e., about 7 percent decrease from 2020 landings. Most of the scallop landings were attributed to limited access (LA) vessels. The landings in FY2020 partly 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 and 40 million pounds in 2021 (Table 20 and Figure 9).

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 20 and Figure 9). The landings in 2021 further declined by about 17% to 2.24 million compared to the 2020 landings.

Figure 9. Scallop landings (in lbs.) by permit category (FY2009-FY2021).



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 FY2021 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 20 and Figure 10). Interannual variability in landings, revenue, and average ex-vessel price per pound over the past ten fishing years is displayed in Table 20 and Figure 10.

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. However, both scallop price and revenues increased significantly in 2021 even though scallop landings in 2021 was lower compared to 2020.

Overall scallop price increased by about 46% in 2021 compared to 2020. Overall scallop price increased to about $16 per pound in 2021 compared to $11 per pound in 2020. Scallop revenue was about $686 million in 2021 compared to about $507 million in 2020. Although landing declined by about 7 percent, but revenue increased by 39% in 2021 compared to 2020. Increase in scallop price and revenue in 2021 was due to strong consumer demand together with some inflationary pressure in the general economy in recent years (Table 20 and Figure 10).

Figure 10. Trends in total scallop revenue and ex-vessel price per pound (both in 2021 $) by fishing year (LA & LAGC fisheries)

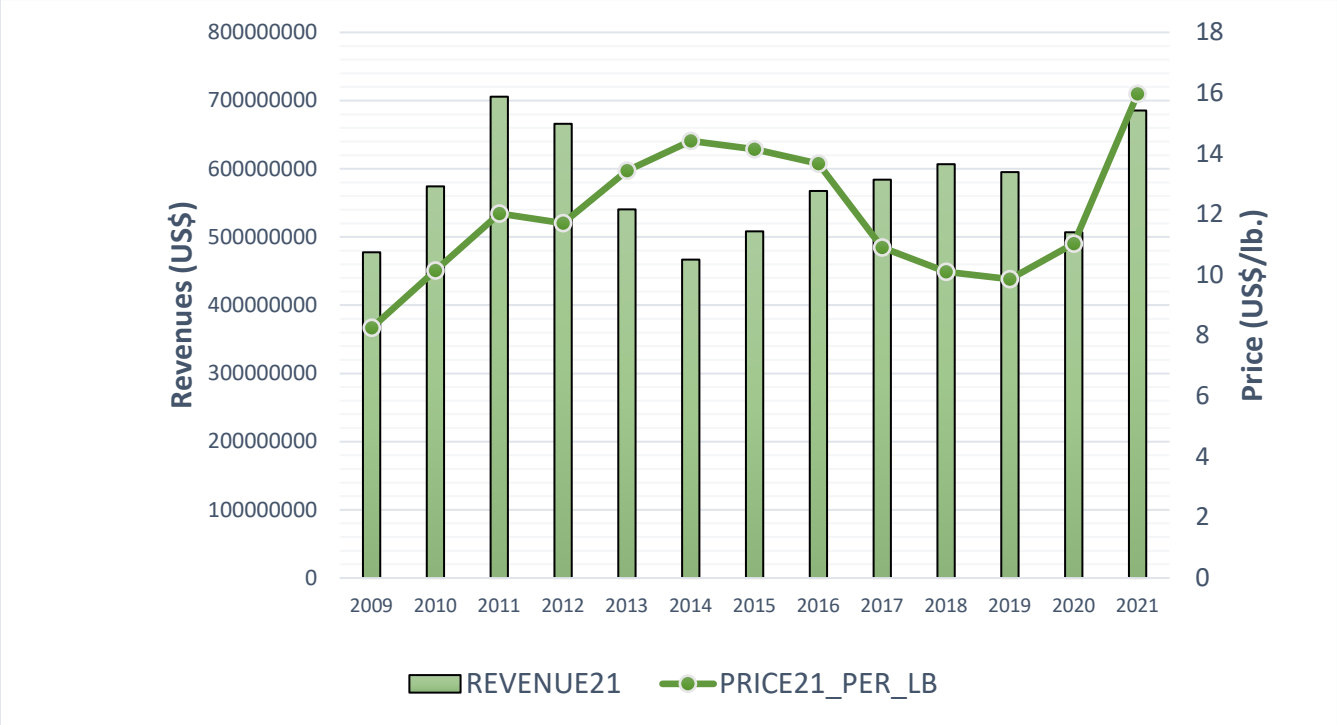


Table 20. Sea scallop landings (also by permit category), revenues, and average prices (FY2009-FY2021).

Fish Years	Landings (pounds)			Total Revenues		Price per pound
	LGC	LA	Total landings	Nominal $	Real $ (in 2021$)	Real $ (in 2021$)
2009	3,765,498	52,301,210	56,066,708	$372,538,290	$477,613,192	$8.25
2010	2,176,421	53,502,413	55,678,834	$453,655,482	$574,247,446	$10.14
2011	2,876,064	55,277,566	58,153,630	$578,711,169	$705,745,328	$12.02
2012	2,897,587	53,222,797	56,120,384	$552,769,693	$665,987,582	$11.71
2013	2,372,607	37,221,866	39,594,473	$459,432,949	$540,509,352	$13.44
2014	2,177,549	29,713,331	31,890,880	$401,510,760	$466,872,977	$14.42
2015	2,492,802	33,056,153	35,548,955	$437,143,932	$508,306,898	$14.15
2016	3,611,174	37,358,052	40,969,226	$493,734,421	$567,510,828	$13.67
2017	2,695,546	50,366,902	53,062,448	$519,841,358	$584,091,414	$10.90
2018	3,035,292	56,764,997	59,800,289	$552,162,845	$606,772,357	$10.10
2019	2,831,163	57,088,022	59,919,185	$553,506,651	$595,168,442	$9.86
2020	2,690,329	42,895,068	45,585,397	$476,533,997	$506,951,061	$11.03
2021	2,244,352	40,005,620	42,249,972	$685,487,418	$685,487,418	$15.97

Table 21. Average scallop landings and revenues (in 2021 dollars) per vessel for FT and FT SMD vessels.

Fish Year	Landings in lbs.		Average Landings per vessel (lbs.)		Average Revenue per vessel (in 2021 dollars)	
	FT	FT SMD	FT	FT SMD	FT	FT SMD
2009	41,411,655	7,298,416	169,027	137,706	$1,414,926	$1,083,748
2010	42,779,955	6,792,986	169,762	130,634	$1,729,618	$1,291,360
2011	44,097,327	7,309,724	175,687	140,572	$2,109,321	$1,695,026
2012	42,749,294	7,063,239	169,640	135,832	$1,990,202	$1,554,717
2013	30,791,957	4,094,184	123,168	78,734	$1,659,985	$1,021,899
2014	24,836,675	3,179,401	98,951	61,142	$1,428,772	$860,019
2015	27,036,665	4,079,589	108,581	78,454	$1,540,138	$1,069,286
2016	29,781,474	4,821,326	119,126	92,718	$1,649,156	$1,161,877
2017	39,668,120	7,173,447	157,413	137,951	$1,705,439	$1,477,616
2018	45,463,988	7,861,387	183,323	145,581	$1,851,022	$1,459,846
2019	44,174,333	9,036,925	177,407	167,350	$1,743,235	$1,613,458
2020	34,571,542	5,849,129	138,286	106,348	$1,516,575	$1,124,682
2021	31,744,061	5,610,754	125,968	102,014	$2,026,760	$1,475,350

The average annual scallop revenue per vessel for both full-time (FT) and full-time small dredge (FT-SMD) fluctuated with annual landings during 2009-2021. Average revenue per FT vessel substantially increased from $1.51 million in 2020 to $2.02 million in 2021. Similarly, average revenue for FT-SMD vessels also increased from $1.12 million per vessel in 2020 to $1.47 million per vessel in 2021 (Table 21 and Figure 12). The average scallop revenue per FT vessel peaked at $2.1 million (in 2021 dollars) in 2011 as a result of higher landings combined with an increase in ex-vessel prices but declined to $1.43 million in 2014.

Figure 11. Trends on average scallop landings per full-time vessel by permit category.

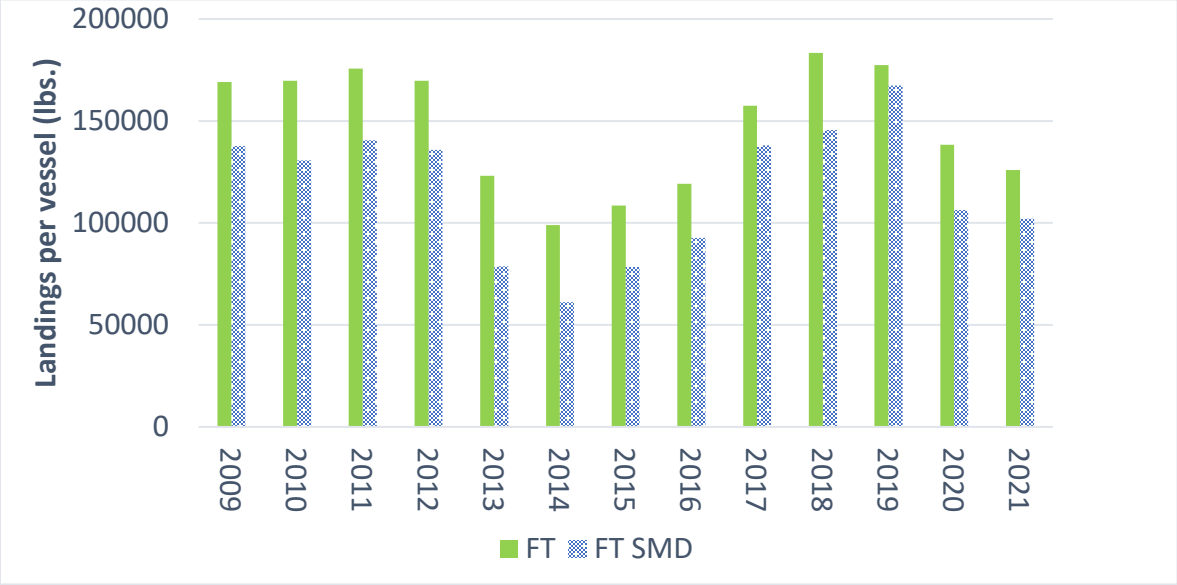
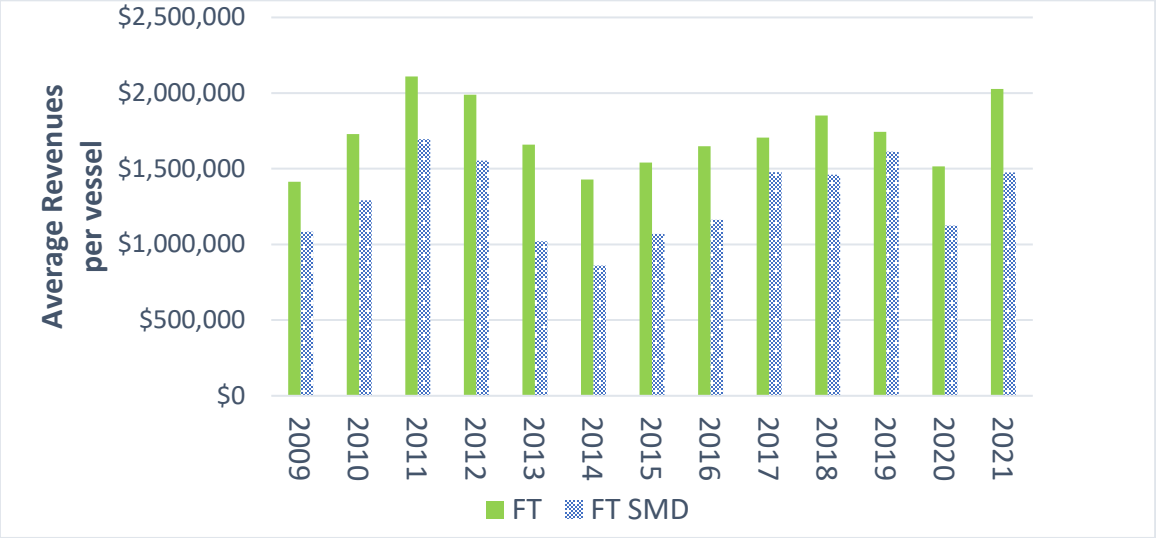
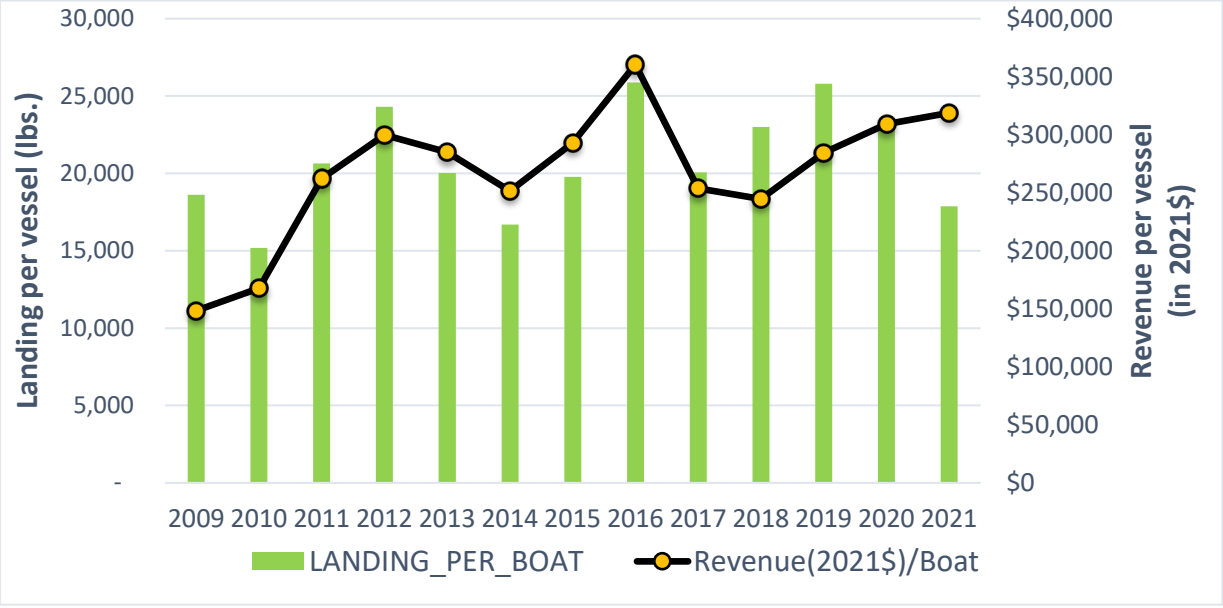


Figure 12. Trends in average scallop revenue per full-time vessel by permit category (in 2021 $)



The revenue per vessel by IFQs vessel has increased over time since 2011. The revenue per boat peaked to about $360,400 in 2016 but declined to around $245,000 in 2018. The revenue per vessel has gradually increased to $284,000 in 2019, $309,000 in 2020 and $318,000 in 2021 (Figure 13). While revenues depend on scallop prices, but the LAGC scallop price in turn largely dependent on the landing volume of the LA component rather than LAGC landings alone.

Figure 13. Average scallop landings and scallop revenue per vessel (in 2021 $) for LAGC-IFQ only boats



5.6.1.1.1 Trends in landings by permit category for limited access vessels

Table 22 and Table 23 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 38). Table 23 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 79% of the scallop pounds were landed by vessels with full-time dredge (FT) permits and 14% landed by vessels with full-time small dredge (FT-STD) permits in 2021. Including the FT-NET vessels that use dredge gear, the percentage of scallop pounds landed by dredge gear amounted to about 96% of the total scallop landings during FY2009-2021.

Table 22. 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	34,571,542	5,849,129	1,283,172	-	1,191,225	42,895,068
2021	31,744,061	5,610,754	1,418,312	-	1,232,493	40,005,620

Table 23. Percentage of scallop landings 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	80.60	13.64	2.99	-	2.78
2021	79.35	14.02	3.55	-	3.08

[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.

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

Beginning in FY2010, 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 24 presents the number of LAGC IFQ-only permits (i.e., excluding LA vessels with IFQ permits) and their scallop landings during 2009-2021. In FY2021, the landings by LAGC IFQ vessels slightly decreased to 2.04 million pounds compared to 2.47 million pounds in FY2020.

Table 24. Active LAGC IFQ vessels and landings (excluding LA vessels w/ IFQ permits), FY2009 to FY2021.

Fish Year	No. of Permit (IFQ only)	IFQ only landings lbs.	Fish Year	No. of Permit (IFQ only)	IFQ only landings lbs.
2009	202	3,759,904	**2016**	135	3,493,944
2010	143	2,170,666	**2017**	129	2,588,370
2011	139	2,870,826	**2018**	123	2,828,934
2012	118	2,869,312	**2019**	101	2,605,933
2013	115	2,302,402	**2020**	106	2,466,530
2014	126	2,103,751	**2021**	114	2,038,782
2015	122	2,413,760			

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 2016-2018. During 2019-2021, total DAS in LA fleet is little over 25,000 (Figure 14).[8]

[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] https://d23h0vhsm26o6d.cloudfront.net/180202_LAGC_IFQ_Council_Approved.pdf

[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.

[8] The total day-at-sea (TDAS) includes transit time and the time spent in scallop fishing in both open and access areas. LPUE estimates derived is, thus, for all areas.

Table 25. 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
2022	FW34	24	3		2	1 NLS-South				15,000
2023	FW36	TBD	TBD	TBD	TBD	TBD	TBD			TBD

[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
+ Information in this table prior to FY2008 and before the implementation of limited access program in scallop fishery is available in FW30 or preceding scallop frameworks.

Between 2009 and 2021, total DAS usage by all LA vessels have ranged from just over 27,000 DAS (in 2010) to just over 16,000 DAS (in 2014) (Figure 14). 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. LPUE for LA vessels declined kept declining from FY2019 to FY2021.

Figure 14. Total DAS-used (Date landed – Date sailed) and LPUE by all LA vessels (includes LA vessels with LGC permit)

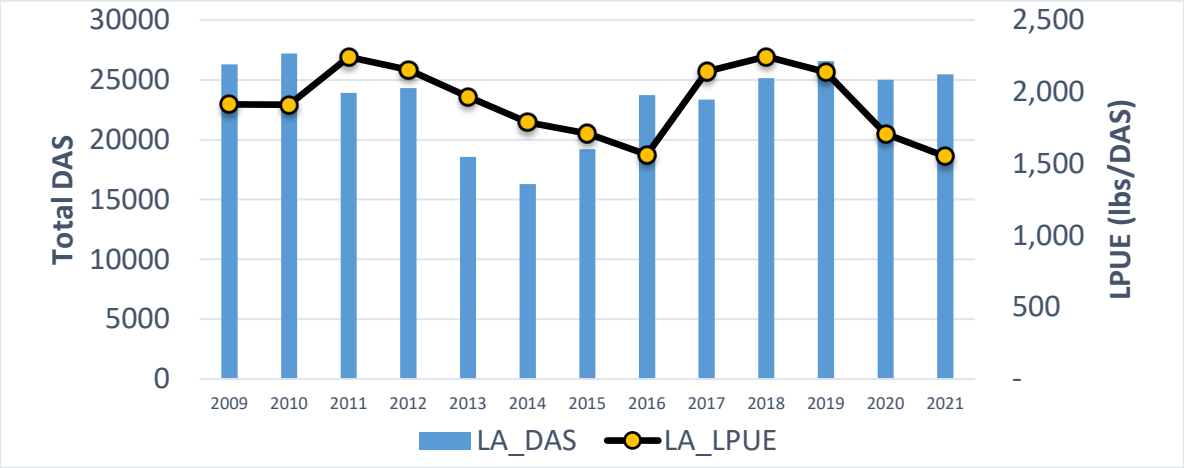
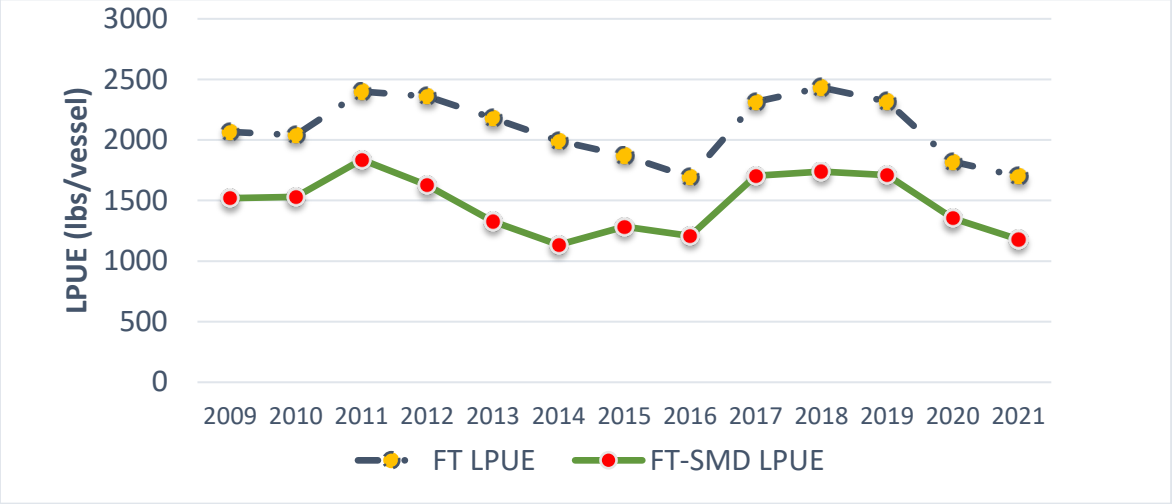


Figure 15 shows that LPUE for full-time dredge (FT) vessels has been consistently higher than LPUE for full time small dredge (FT-SMD) vessels, and that LPUE for both categories has trended in a similar manner between 2009 and 2021. In FY2021, LPUE for FT and FT-SMD vessels were 1,699 pounds per day and 1,178 pounds per day, respectively. LPUEs have trended down since FY2019 and are near the lowest level (Figure 15).

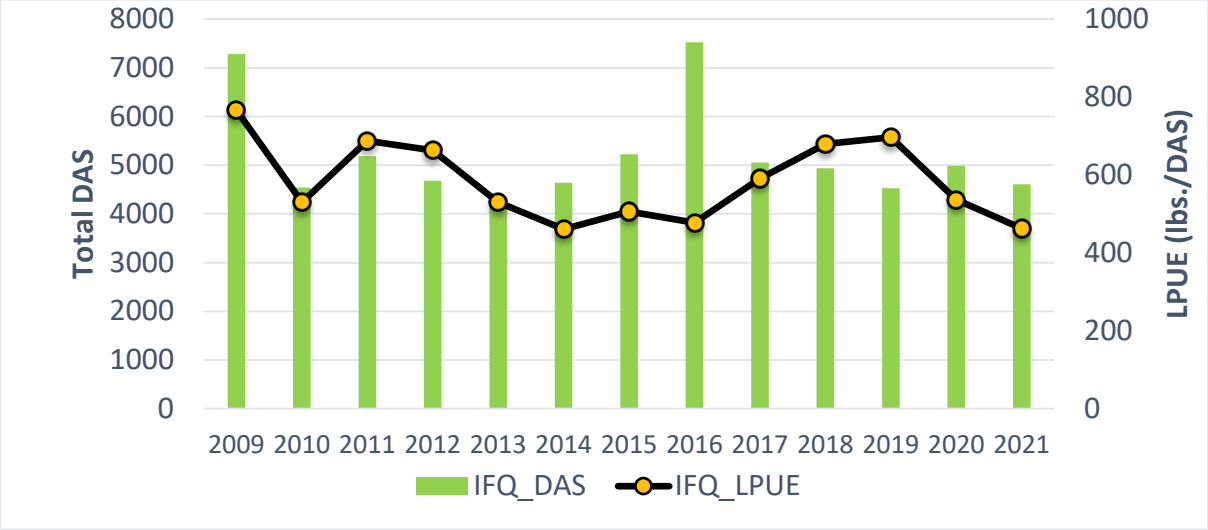
Figure 15. LPUE for full-time LA vessels by permit category (includes steam time)



DAS for LAGC IFQ vessels (IFQ only) declined substantially by about 40 percent from its highest level at 7,524 DAS in 2016 to 4,606 DAS in 2021. 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 477 pounds per day in 2016, to 697 pounds per day in 2019 but declined to 663 pounds per day in 2021 (Figure 16).

Figure 16. LPUE and DAS-used for LAGC-IFQ only vessels (includes steam time, excludes LA vessels with IFQ permit)



5.6.1.2.1 Open Area DAS, Landings, and LPUE

Open area DAS for an individual FT vessel in different fishing year since 2008 along with the status of access areas and possession limit is presented in Table 25.

Average open area LPUE estimates from fishing year 2009 to 2022 are shown in Table 26. Open area landings by month and fishing year are shown in Table 27. Open area days-at-sea used by month and fishing year are shown in Table 28. Open area LPUE has declined in recent years. In FY2021, open area TDAS was 8213 days with total landings of 17.67 million pounds. LPUE in open area is estimated to be about 2033 pounds per DAS.

Table 26. Average open area LPUE (lbs per day) by month and fishing year (source: GARFO).

fishing year/month	1	2	3	4	5	6	7	8	9	10	11	12	annual average LPUE
2010					2,618	2,304	2,363	2,292	2,289	2,035	2,017	2,227	
2011	2,379	2,385	3,196	3,002	3,062	2,887	2,851	2,813	2,539	2,193	1,822	1,786	2,562
2012	2,211	2,382	3,173	2,911	2,902	2,956	3,133	2,696	2,304	2,097	1,915	2,673	2,657
2013	2,759	2,364	3,586	3,328	3,131	2,739	2,526	2,273	2,119	1,957	1,508	1,557	2,373
2014	1,975	1,774	2,405	2,572	2,408	2,099	1,699	1,875	1,710	1,520	1,149	1,381	1,785
2015	1,547	1,050	1,853	1,757	1,965	1,645	1,435	1,325	1,086	987	1,139	1,225	1,473
2016	1,831	1,431	1,857	1,941	1,976	1,891	1,829	1,845	1,718	1,453	1,199	1,377	1,648
2017	1,491	1,196	2,900	2,595	3,150	2,707	2,615	2,580	2,493	2,073	1,587	1,573	2,341
2018	1,881	2,651	1,633	3,293	2,693	2,680	2,457	2,373	2,036	2,024	1,581	1,660	2,328
2019	2,560	2,814	1,764	3,811	2,516	2,908	2,546	2,216	1,988	1,484	1,632	1,407	2,165
2020	1,867	1,839	1,769	2,549	1,826	2,041	1,903	1,741	1,449	1,272	1,007	1,441	1,653
2021	1,538	1,603	1,464	2,695	2,032	2,212	2,394	2,098	1,744	1,495	1,345	1,920	2,033
2022	2,186	2,449	1,821	2,169	2,195	2,280	2,102	248					

Table 27 – Open area landings (lbs) by month and fishing year (source: GARFO).

fishing year/month	1	2	3	4	5	6	7	8	9	10	11	12	annual open area landings
2010					6,409,611	4,261,861	1,288,439	2,867,821	4,243,302	2,955,339	1,101,726	559,986	
2011	629,066	1,348,144	2,360,814	4,118,589	7,593,001	6,617,012	4,334,311	265,114	852,865	1,164,417	536,362	272,300	30,189,132
2012	629,305	1,445,042	1,760,945	3,578,670	6,861,539	5,746,076	2,713,656	3,199,531	1,380,436	1,084,992	317,283	799,484	29,354,034
2013	761,229	1,150,193	2,124,248	4,145,784	6,347,425	3,862,451	3,270,333	2,918,145	2,229,762	961,388	218,140	349,915	28,174,327
2014	491,724	1,255,012	1,344,280	4,778,893	5,250,286	3,422,274	1,876,072	1,749,004	1,627,092	621,174	285,169	173,124	21,845,676
2015	336,912	381,396	981,668	2,898,340	2,780,890	2,371,399	2,133,866	1,721,816	719,364	339,318	246,206	234,019	15,375,118
2016	189,765	758,467	1,153,922	1,213,221	3,628,568	3,615,671	3,170,416	2,807,293	1,786,350	706,162	368,702	263,806	20,040,032
2017	480,579	845,342	2,348,492	833,808	3,089,281	3,200,933	3,393,064	4,061,477	1,884,869	2,114,398	550,909	298,966	24,481,940
2018	298,964	1,094,504	1,312,275	2,141,553	2,076,785	3,294,850	2,884,412	2,373,599	1,115,999	990,869	373,474	295,472	19,196,220
2019	710,099	1,286,544	1,652,564	1,025,259	587,935	2,505,956	4,186,953	2,848,585	1,523,949	518,512	128,329	74,600	16,573,439
2020	462,478	743,532	1,967,351	541,636	285,430	1,662,689	2,773,441	1,837,188	1,388,786	615,836	164,842	178,626	12,861,931
2021	464,846	962,943	1,985,668	4,324,959	2,298,695	1,333,733	2,085,998	1,988,696	1,430,094	687,295	216,078	267,551	17,666,565
2022	604,234	947,813	1,481,419	1,265,538	2,321,033	2,938,953	2,046,909	52,006					

Table 28 – Open area days-at-sea used by month and fishing year (source: GARFO).

fishing year/month	1	2	3	4	5	6	7	8	9	10	11	12	annual open area DAS used
2010					2,448	1,850	545	1,251	1,854	1,452	546	251	
2011	264	565	739	1,372	2,480	2,292	1,520	94	336	531	294	152	10,702
2012	285	607	555	1,229	2,365	1,944	866	1,187	599	517	166	299	10,490
2013	276	487	592	1,246	2,027	1,410	1,295	1,284	1,052	491	145	225	10,724
2014	249	708	559	1,858	2,180	1,630	1,104	933	952	409	248	125	10,579
2015	218	363	530	1,650	1,415	1,442	1,487	1,300	662	344	216	191	9,871
2016	104	530	622	625	1,837	1,912	1,733	1,522	1,040	486	308	192	11,304
2017	322	707	810	321	981	1,183	1,297	1,574	756	1,020	347	190	9,855
2018	159	413	804	650	771	1,230	1,174	1,000	548	490	236	178	7,948
2019	277	457	937	269	234	862	1,644	1,286	767	349	79	53	7,306
2020	248	404	1,112	212	156	814	1,458	1,055	959	484	164	124	7,686
2021	302	601	1,356	1,605	1,131	603	871	948	820	460	161	139	8,215
2022	276	387	813	584	1,057	1,289	974	209					

5.6.1.3 Trends in the size composition of scallop landings

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 29 and Table 30 illustrate landings by market grades in pounds and as a percentage to total landings. In FY2021, U10 landing share declined to 14 percent from 16 percent in FY2020.

Table 29. 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	713,057	45,961,206
2021	6,056,458	21,654,887	9,824,152	4,641,362	760,029	42,936,888

Table 30. 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	5.3	2.75
2017	19.00	54.84	23.61	0.72	1.83
2018	18.07	68.83	11.53	0.11	1.47
2019	19.78	63.21	13.50	1.75	1.74
2020	16.71	57.84	15.26	8.63	1.55
2021	14.11	50.43	22.88	10.81	1.77

Table 31. Composition of scallop revenue by size (percent of total scallop revenue)

Fish Year	U10	11 to 20	21 to 30	31+	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
2021	22.5	48.54	19.85	7.20	1.91

Larger scallops fetched higher prices than smaller scallops which led to an increase in overall average scallop prices since FY2009 (Table 32). An increase or decrease in prices of U10 scallops corresponds to annual landings for this market category. Price per pound (in 2021 dollars) for U10 landings reached a high point in 2016 at $19.63 but declined to $13.63 in 2020. Average U10 price was record high in 2021 at $25.32, and it was over $35 per pound for some months in 2021. Similarly, the average price of 11-20 count scallops was around $16.82

per pound, and average price of 21-30 and 31-40 count scallops ranged between approximately $14.54 and $11.52 per pound in FY2021. Overall scallop prices in FY2021 were record high for nearly all market grade scallops.

Table 32. Price of scallop per pound by market category (in 2021 dollars)

Fish Years	Price U10	Price 11-20	Price 21-30	Price 31-40	Price 41+	Price Unknown
2009	$10.22	$7.94	$7.53	$7.96	$8.41	$11.08
2010	$13.41	$10.20	$10.54	$10.50	$10.29	$12.46
2011	$13.34	$12.22	$12.80	$12.56	$9.76	$16.18
2012	$13.11	$11.84	$12.09	$11.46	-	$19.01
2013	$15.57	$13.40	$13.53	$12.67	$9.99	$16.44
2014	$16.85	$14.32	$14.06	$12.55	$8.10	$16.45
2015	$17.65	$13.73	$13.50	$12.60	$8.24	$15.93
2016	$19.63	$13.86	$12.40	$10.65	$10.71	$14.72
2017	$14.86	$11.26	$10.69	$10.10	$10.17	$13.38
2018	$12.52	$10.11	$10.39	$9.97	$12.91	$11.95
2019	$12.51	$10.26	$9.65	$8.84	$8.61	$11.31
2020	$13.63	$13.50	$11.53	$7.78	$8.48	$13.50
2021	$25.32	$16.82	$14.54	$11.52	$12.75	$18.01

5.6.1.4 Trends in permits by permit plan and category

Table 33 shows the number of active limited access vessels by permit category during 2009-2021 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.[9] There were a total of 250 active full time limited access vessels in 2021. The number of LA vessels that also held an LAGC permit is shown in Table 34. The number of unique limited access permits in 2021 is shown in Table 35.

[9] The permit numbers shown in the Table 39 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 33. Number of limited access vessels by permit category and gear

Permit Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
FT	245	252	251	252	250	251	249	250	252	248	249	250	250
FT-Net	11	11	11	11	11	11	11	11	11	10	11	11	11
FT-SMD	53	52	52	52	52	52	52	52	52	54	54	55	54
Sub-total FT	**309**	**314**	**315**	**314**	**313**	**314**	**312**	**312**	**311**	**313**	**308**	**316**	**315**
PT	2	2	2	2	2	2	2	2	2	0	0	0	0
PT-SMD	32	32	32	31	31	31	32	32	31	31	32	30	29
Sub-total PT	**32**	**34**	**34**	**33**	**32**	**34**	**33**	**34**	**33**	**32**	**32**	**30**	**29**
Grand Sum	**343**	**349**	**348**	**348**	**346**	**347**	**346**	**347**	**348**	**343**	**346**	**346**	**344**

Table 34. 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
2021	38	28	112

Table 35. Unique scallop permits and category for the 2021 application year

Permit Category	2021	Permit Category	2021
Full-time	250	Part-time	0
Full-time small dredge	54	Part-time small dredge	29
Full-time net boat	11	Part-time trawl	0
Total full-time	**315**	**Total part-time**	**29**
Total Limited Access	**344**		

Table 36 shows that the number of LAGC permits, including LAGC permits held by LA vessels. The number of LAGC permits declined considerably after 2009 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 37.

Table 36. 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
2021			

Table 37. Active LAGC permits after Amendment 11 implementation (excludes LAGC permits held by LA vessels).

Year	**IFQ**	**NGOM**	**INCI**
2009	199	7	55
2010	161	9	54
2011	141	7	55
2012	122	12	66
2013	119	22	61
2014	124	25	55
2015	122	27	45
2016	134	32	52
2017	129	33	35
2018	127	39	36
2019	108	44	24
2020	102	46	24
2021	112	51	24

The trends in the estimated number of active LA vessels are shown in Table 38 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 38).[10] Table 39 shows the number of active LAGC vessels by permit category excluding those LA vessels which have both LA and LAGC permits.

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

Table 38. Active vessels (i.e., vessels with scallop landings) during FY2009-2021

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
2021	252	0	55	29	11	347

Table 39. No. of active vessels with LAGC permits by permit category (excludes LA vessels w/ LGC permit)

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
2021	114	53	20

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 40 and Table 41). The number of vessels by home port state and port of landing have remained about same across the 2009-2021 time period, suggesting that permit transfers across states are minimal.[11] The number of LAGC IFQ permits are also

[11] 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

summarized by both homeport state and primary port state as identified by the permit owner in Table 42 and Table 43.

Table 40. Number of limited access permits (LA only) by home state

HPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CT	10	10	10	10	9	9	9	10	10	9	8	4	3
FL	4	4	4	4	3	3	3	3	3	3	3	3	3
MA	145	147	148	149	149	150	145	145	145	147	143	144	148
ME	4	3	3	3	3	3	3	3	3	2	2	1	1
NC	41	40	39	38	40	39	41	41	38	38	42	44	38
NJ	84	90	92	91	92	94	91	92	96	94	98	99	96
NY	3	4	3	2	2	1	0	0	1	1	0	0	0
PA	5	5	4	3	3	3	3	3	3	3	3	3	2
RI	2	3	2	2	2	2	2	2	2	2	2	2	2
VA	43	45	45	46	42	44	52	46	45	44	45	46	53
Total	**341**	**351**	**350**	**348**	**345**	**348**	**349**	**345**	**346**	**343**	**346**	**346**	**346**

Table 41. Number of limited access permits (LA only) by primary port state

PPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CT	10	10	10	10	9	9	9	10	10	9	8	4	3
MA	146	148	149	150	150	153	148	148	147	149	146	148	152
ME	4	3	3	3	3	3	3	3	3	2	2	1	1
NC	26	25	24	23	25	25	29	29	27	26	30	31	29
NJ	88	93	94	94	94	95	93	95	100	98	102	104	101
NY	2	3	3	2	2	1	0	0	1	1	0	0	0
PA	1	1	1	1	1	1	1	1	0	0	0	0	0
RI	2	3	2	2	2	2	2	2	2	2	2	2	2
VA	62	64	64	63	59	60	64	58	56	56	56	56	57
Total	**341**	**350**	**350**	**348**	**345**	**349**	**349**	**346**	**346**	**343**	**346**	**346**	**345**

(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 42. No. of LAGC (IFQ only) permits by home state ports (exclude LA vessels w/ IFQ permit)

HPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CT	3	2	1	2	3	4	3	3	3	3	3	3	4
DE	1	2	2	2	2	2	2	2	3	0	1	1	1
FL	1	1	0	0	0	0	0	0	0	0	0	0	0
GA	1	1	0	0	0	0	0	0	0	0	0	0	0
MA	60	44	43	37	36	40	41	44	46	48	42	43	49
MD	8	5	4	3	2	2	2	4	3	3	2	3	3
ME	9	6	3	4	3	3	5	3	6	9	7	4	4
NC	30	22	16	9	10	9	10	12	8	8	6	5	6
NH	4	2	3	3	2	2	1	1	1	1	0	0	0
NJ	54	48	44	40	39	43	40	43	39	37	32	29	33
NY	17	15	15	13	12	13	12	12	11	11	10	10	11
PA	1	1	1	1	1	1	0	0	0	0	0	0	0
RI	5	5	6	6	6	4	4	4	4	4	4	4	3
TX	0	0	0	1	1	1	1	1	1	1	1	0	0
VA	5	4	3	3	2	3	2	4	3	3	2	1	1
Total	**199**	**158**	**142**	**124**	**119**	**127**	**123**	**133**	**128**	**128**	**110**	**103**	**115**

Table 43. No. of LAGC (IFQ only) permits by primary port state (excludes LA vessels w/ IFQ permit)

PPST	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
CT	3	2	1	2	3	4	3	4	4	4	4	4	4
DE	0	0	0	0	0	0	0	1	1	0	1	1	1
FL	2	2	0	0	0	0	0	0	0	0	0	0	0
GA	1	1	0	0	0	0	0	0	0	0	0	0	0
MA	60	45	44	38	37	41	42	45	47	49	42	43	50
MD	10	8	7	6	5	5	5	6	6	4	3	4	3
ME	8	5	3	4	3	3	5	3	6	9	7	4	3
NC	27	21	15	9	10	9	10	13	9	8	7	4	5
NH	4	1	2	2	1	1	0	0	0	0	0	0	0
NJ	55	48	45	41	40	44	40	43	39	35	30	30	34
NY	17	15	15	13	12	13	12	11	10	10	9	9	11
PA	0	0	0	0	0	0	0	0	0	2	2	2	0
RI	6	6	6	6	6	4	4	4	4	4	4	4	3
VA	5	4	3	3	2	3	2	3	2	3	1	0	1
Total	**198**	**158**	**142**	**124**	**119**	**127**	**123**	**133**	**128**	**128**	**110**	**105**	**115**

5.6.1.6 Foreign trade (import, export, and re-export) of scallops in FY2017-FY2021

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 FY2021, the U.S. imported about 62 million lbs. or $393 million of scallop products primarily from Japan, China, Canada, Argentina, and Peru. U.S. imports of scallop products in 2021 increased significantly in both volume and value compared to 2020.

In FY2021, the top five destinations for U.S. scallop exports have been Canada, Netherlands, France, South Korea and United Kingdom. The U.S. exported about 6.67 million pounds or $72 million value of scallop products largely to these countries. Scallop exports in 2021 marginally declined relative to FY2020. The U.S. also re-exported some of its imports at a re-export value of about $29 million, primarily to France and Canada. The re-export value in FY2021 increased by about $8 million compared to FY2020. Table 44 presents the volume and values (in nominal dollars) of U.S. imports, exports, and re-exports of scallops with major countries during FY2017-2021. It also provides average import and export prices for scallop products for the same period.

Table 44. Summary of U.S. scallop trades with top five countries during FY2017-FY2021.

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 Re-export**	**2.41**	**$15.65**
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 Re-export**	**2.41**	**$15.65**
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 Re-export**	**2.9**	**$18.26**
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 Re-export**	**3.55**	**$20.53**
Import 2021			**Export 2021**			**Re-Export 2021**		
Countries	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**	**Countries**	**mil lbs.**	**mil $**
Japan	17.03	$149.50	Canada	2.76	$31.9	France	3.75	19.60
China	12.95	$32.32	Netherlands	1.56	$15.31	Canada	1.10	8.55
Canada	9.89	$111.82	France	0.41	$4.93	Peru	0.04	0.23
Argentina	7.08	$26.60	South Korea	0.27	$3.14	Japan	0.01	0.18
Peru	5.97	$38.40	UK	0.26	$2.27	Colombia	0.01	0.06
Other	23.66	$35.28	Other	1.39	$14.4	Other	0.01	$.22
SUM Imports	**61.68**	**$393.92**	**SUM Exports**	**6.67**	**$71.95**	**SUM Re-export**	**4.93**	**$28.84**
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
Import Price 2021		$6.39	Export Price 2021		$10.79	Re-Export Price 2021		$5.85

5.6.1.7 Trip and Fixed costs

Trip and fixed cost estimates for LA and LAGC IFQ vessels for FY2020 and FY 2021 will be provided in the Appendix for Economic Models.

5.6.2 Northern Gulf of Maine

The 2022 fishing year marked the first NGOM season under new management measures adopted through Amendment 21 to the Scallop FMP. Data on participation in the NGOM area by LAGC vessels since 2010 is provided below, along with information about permit movement within the LAGC component of the fishery.

5.6.2.1 Northern Gulf of Maine Fishery Data

Table 45 - Number of active vessels, total trips, average landings, and trips per vessel in the NGOM management area from 2010 - 2022. NMFS/GARFO, August 15, 2022.

FY	Mean	Median	Max	Active vessels	Total trips	Average Catch (lbs)
2010	7	6	15	11	81	70
2011	10	4	37	10	95	62
2012	6	1	27	10	60	79
2013	27	23	101	18	483	104
2014	20	11	80	26	507	156
2015	23	16	87	30	682	131
2016	15	15	43	38	567	174
2017	7	7	18	38	278	197
2018	19	20	42	40	751	184
2019	17	18	33	45	753	190
2020	22	22	40	47	1024	170
2021	14	15	29	49	691	190
2022	27	30	50	106	2894	207

Figure 17 - Range of trips per week, per vessel for fishing years 2010- 2022 in the Northern Gulf of Maine. Weeks included were only those when the Northern Gulf of Maine was open. NMFS/GARFO, August 15, 2022.

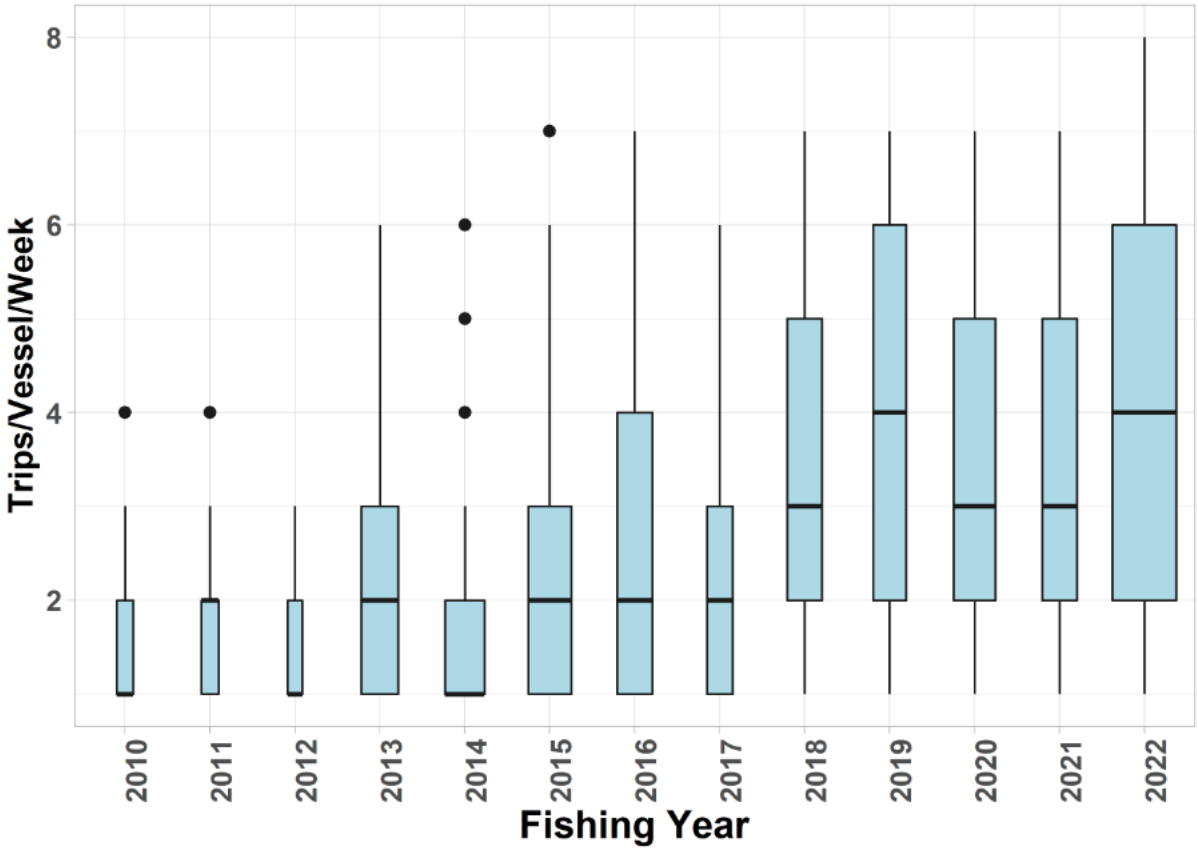


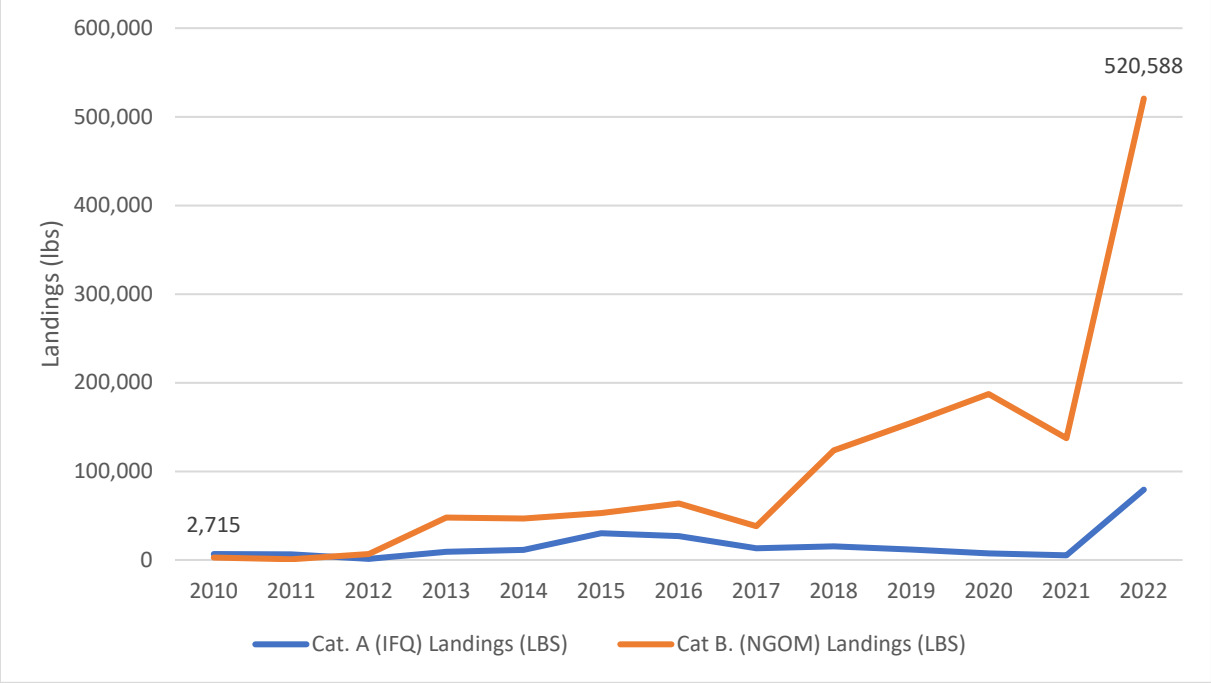
Table 46 - Vessels with multiple sailings/day, and total times this occurred.

FY	Vessels with multi trips	Number of multi trips
2010	0	0
2011	0	0
2012	0	0
2013	0	0
2014	3	3
2015	0	0
2016	2	2
2017	3	3
2018	7	9
2019	7	14
2020	6	6
2021	2	2
2022	17	21

Table 47 - Number of LAGC Cat. A and Cat. B permits with declared trips to NGOM, 2010 - 2022.

Fishing Year	LGC A (IFQ	LGC B (NGOM)
2010	6	5
2011	6	4
2012	3	6
2013	7	11
2014	7	17
2015	8	20
2016	11	25
2017	10	26
2018	6	34
2019	6	39
2020	3	43
2021	5	44
2022	28	73

Table 48 - NGOM Landings by permits type (Cat. A & Cat. B), 2010 - 2022. Source: NMFS, August 1, 2022.



5.6.2.2 Permit Movement

Currently, LAGC B (NGOM) and LAGC C (Incidental) permit holders may move between these two permit categories annually, or mid-season when a permit is transferred to a new owner. LAGC A (IFQ) permit holders can make a one-time transition from IFQ to NGOM/Incidental.

A summary of permit movement from 2008-2022 (11 years) is in Table 49.

- 31 permits converted from IFQ (A) to NGOM/Inc (B/C)
- 6 permit switches occurred within a year (when a vessel was bought/sold), 5 times a permit switched to B from C.
- 39 permits moved from Incidental to NGOM across years (when renewing a permit)
- 4 moved from NGOM to incidental across years (when renewing a permit)

Table 49. Summary of LAGC conversions and switches between FY 2008 and FY 2022. Data from NMFS/GARFO, August 11, 2022.

Year	Conversion from A to B/C	From B to C Within a year	From C to B Within a year	From B to C Across Years	From C to B Across Years
2008	-	-	-	-	-
2009	0	0	0	0	3
2010	0	0	0	0	1
2011	1	0	0	0	0
2012	1	0	0	2	2
2013	2	0	0	0	0
2014	6	1	1	1	0
2015	0	0	2	0	0
2016	0	0	0	0	0
2017	3	0	0	0	1
2018	3	0	0	0	1
2019	2	0	1	0	1
2020	4	0	0	1	2
2021	6	0	1	0	2
2022	3	0	0	0	26
Total	31	1	5	4	39

Data for 2022 is based on requests received and processed as of August 12, 2022.

Table 50. Number of Scallop LAGC Cat. A (IFQ) MRIs with zero base allocation at the start of the fishing year as of August 11, 2022.

FY	MRI
2011	7
2012	5
2013	28
2014	46
2015	49
2016	66
2017	88
2018	87
2019	94
2020	104
2021	107
2022	102

Table 51 - LAGC IFQ permits with zero allocation by state and permit status (CPH or on a vessel). Data from NMFS/GARFO, August 15, 2022.

	CPH	Vessel
MA	28	28
NJ	9	14
Other	7	18
Total	43	60

Table 52 - Number of LAGC Category B permits issued to vessels, 2010 - 2022. Data from NMFS/GARFO, August 11, 2022.

Fishing Year	Total Cat B Permits
2010	105
2011	97
2012	90
2013	92
2014	90
2015	90
2016	93
2017	95
2018	99
2019	102
2020	109
2021	125
2022	158

Table 53 – Number of LAGC Category B permits issued to vessels in 2022 by homeport state. Data from NMFS/GARFO, August 11, 2022

State	Cat. B Permits
MA	74
ME	66
NC	5
NH	6
NJ	4
Other	4

Table 54 - Number of LAGC permits, by category, held by Limited Access vessels in fishing year 2021 and 2022. Data from NMFS/GARFO, August 11, 2022.

	2021 FY	2022 FY
Cat A (IFQ)	40	40
Cat B (NGOM)	28	53
Cat C (Inc)	111	89

5.6.3 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. The data set used in analysis for the following sub-sections is based on the 2010 to 2017 time period and represents the most recent available information characterizing fishing communities in the scallop fishery. This data set is expected to be updated over the next calendar year.

5.6.3.1 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 55):

- At least $5M average annual revenue of sea scallops, 2010-2017 (Table 56); or,
- 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; or
- 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 57).

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 55). 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 impractical 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 55 – 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 56 – 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 57 – 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.

5.6.3.2 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 58).

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 58 – 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 59.

Table 59 – 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)

References to "biological impacts" in the following sections are focused on impacts of the measures being considered in this action (Framework 36) to the scallop resource.

6.2.1 Action 1 – Overfishing 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 60 – Comparison of the No Action OFL/ABC from FW34 with updated OFL and ABC estimates for 2023 and 2024 (Alternative 2).

	FY	OFL	ABC including discards	Discards	ABC with discards removed
Alt. 1 – No Action	2023	34,941	27,606	4,406	23,200
Alt. 2 – Updated OFL and ABC	2023	27,504	22,631	2,803	19,828
	2024	29,151	23,289	3,083	20,206

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 2023, which were adopted by the Council through FW34 (Table 60). The No Action ABC including discards is 27,606 mt, or about 61 million pounds. The OFL values for No Action is substantially higher than the update OFL for 2023 (7,437 mt difference). The declining legal limits (OFL and ABC) are the result of several years of below average recruitment and declining overall biomass. In 2022, survey biomass reached its lowest level since 1999. The proposed ABC for FY2023 including discards is 22,631 mt, or about 49.9 million pounds, which is a roughly 17-million pound decrease in the ABC from the 2022 value, and a roughly 11 million pound decrease from the FY2023 default value 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 2022 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 2023 and FY 2024 (*Preferred Alternative*)

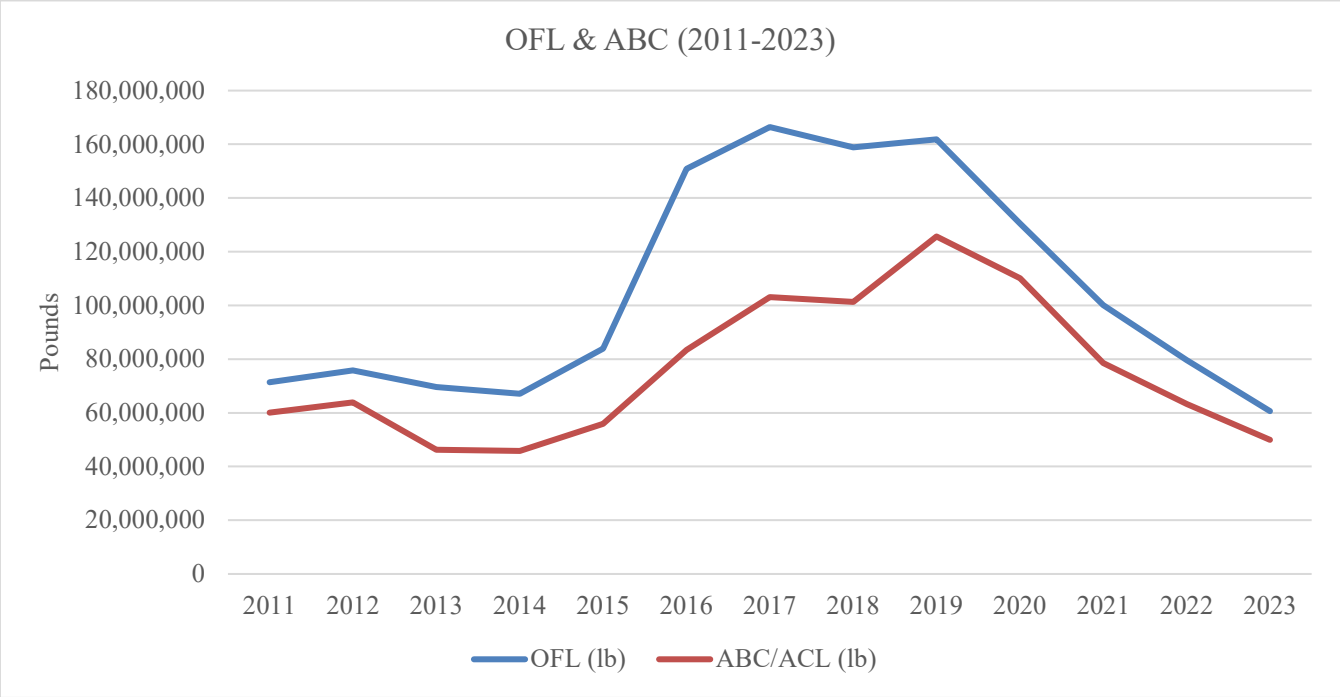
The FY 2023 and FY 2024 OFL and ABC values that were recommended by the SSC are summarized in Table 65. This year, the SSC recommended including scallop biomass from several areas of the Gulf of Maine as part of the OFL and ABC.

Under Alternative 2, the FY2024 (default) OFL would be slightly greater than the FY2023 OFL, though both the FY2023 and FY2024 (default) OFLs under Alternative 2 would be lower than the No Action OFL. The 2023 ABC is 25% lower than the ABC for 2022 that was approved in Framework 34, which continues a downward trend of both OFL and ABC values for the fishery over the last 5 years (Table 61). The declines in both the OFL and ABC are the result of several years of below-average recruitment, and the decline of the exceptional 2012 and 2013 year-classes that supported record landings for the fishery in 2018 and 2019. There are several cohorts on

Georges Bank, including pre-recruits, recruits, and adult scallops. In 2023, 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 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 specifications should have slight positive impacts.

Table 61 - Scallop OFL and ABC values in pounds, FY 2011 – FY 2023.



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

6.2.2.1 Alternative 1 – No Action

Under No Action, the NGOM Set-Aside would be set at 448,062 pounds for FY2023 after accounting for a 17,918 pound overage in 2021. There would be no NGOM set-aside specified for FY 2024, and the area would close to directed scallop fishing.

The No Action NGOM Set-Aside would be greater than Options 1, 2, and 3 developed under Alternative 2, but slightly less than Option 4 (458,016 pounds). If all of the NGOM Set-Aside was fished on Stellwagen Bank, the realized F rate would likely be greater than a F=0.18, which was analyzed in Option 2. If fishing is dispersed across multiple areas of the NGOM in 2023, then realized F associated with the No Action is likely to be less than F=0.18 overall for the area. Growth assumptions for the Stellwagen Bank area of the NGOM are uncertain and could be overestimated. No Action would be expected to have a slight negative impact on the scallop resource in the NGOM compared to the Council's preferred option, Option 3.

6.2.2.2 Alternative 2 - Set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery (*Preferred Alternative*)

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY 2023 and FY 2024 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Option 1 (F=0.15) and Option 2 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank only. Options 3 (F=0.15) and Option 4 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge.

6.2.2.3 2023 NGOM TAL Options (*Option 3 is Preferred*)

All four NGOM TAL options utilize a conservative F rate for setting harvest levels (F=0.15 and F=0.18). The NGOM covers several banks and ledges, and vessels can choose to fish anywhere within the management unit. The NGOM set-aside (i.e., expected landings by LAGC vessels) increases as F rates increase and as the area that is assumed to be fished expands (i.e. just Stellwagen vs. Stellwagen and Ipswich and Jeffreys). When comparing between the four TAL options, the option with the most positive impacts on the sea scallop resource would be considered Option 1, and the option with the least positive impacts would be Option 4. Under Options 3 and 4, if more harvest occurs on Stellwagen Bank than expected, the realized F rate may be higher than an F=0.15 or F=0.18. However, with the application on the 2021 accountability measure, harvests under all scenarios would be reduced. Option 4 and No Action could be expected to have the greatest impact on the scallop resource in the area by setting harvest limits 70-80 thousand pounds more than Option 3. Growth assumptions for the Stellwagen Bank area of the NGOM are uncertain and could be overestimated. Most of the fishing is expected to occur on Stellwagen Bank, which continues to hold relatively high densities of exploitable scallops. Recent experience has shown higher levels of mortality when directed fishing occurs on high densities of scallops, such as in the NLS and AII regions. Scallops in the Stellwagen Bank area are six years old, 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 describes the short-term (ST) and long-term (LT) impacts of fishery removals for each specification scenario in Action 3. 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 Action 3 alternatives 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 annual catch target (ACT) includes an overall fishing mortality limit of 0.39 for the total fishery (Section 3.3). The range of total fishing mortality under consideration is between 0.18 Alternative 1 (No Action) and a high of 0.295 for Alternative 5 (Status Quo). The overall F rates for options in Alternatives 2, 3, and 4 range from 0.22 at 22 DAS and two 10,000 pound access area trips to 0.26 at 24 DAS and two 14,000 pound access area trips. While overall fishing mortality associated with each of the alternatives remains lower than legal limits, there are important trade-offs in the ST about where F may occur spatially in open bottom and Area 2.
- Total fishing mortality is constrained so that average fishing mortality does need to exceed FMSY (0.61) in open areas. 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 36 that would meet or

exceed the average open area F at the upper bound of F=0.61. Alternatives in Section 4.3 consider open area F rates at two DAS options of 22 DAS and 24 DAS.

- When compared to estimates of the overall F from the preferred alternatives in recent actions (FW25 – 34), the estimates of overall (total) F rates for all alternatives under consideration are similar to the estimated F rates from 2021 and 2022, by generally higher than overall F rates between the period of 2016 - 2020. The forecasted overall F rate has been increasing for several years and is likely to be similar to 2022 levels (higher or lower). The general increase in overall F was expected as the exceptional 2012 and 2013 year classes have moved through the fishery with below average recruitment for an extended period after 2013. 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.
- Alternatives are modeled over the short-term (ST) and long-term (15 years, LT) to make comparisons about the LT impacts of management decisions for the coming fishing year. The LT forecasts can help to identify trade-offs between ST management measures by comparing how impacts of harvest in year 1 affect the scallop resource when applying the same assumptions across all alternatives. The LT forecasts apply a fixed fishing mortality rate of F=0.48 for open areas in all years after year 1 (i.e. FY2023), and adjust rotational management in years 2-4. In year 5, all rotational areas are opened, and fished at F=0.48. The simulation in FW36 assumes that the NYB closure will re-opened as an access area in 2024. Since the Council generally sets specifications for one or two years, the LT estimates should be interpreted as relative comparisons between measures, and not absolute values of future landings and economic impacts.
- The short term and long-term forecasts shown in Figure 19 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 FY2023 would result in similar outcomes of F over the ST and LT under similar assumptions of fishing behavior over that time.
- Figure 20 illustrates the range of F rates predicted for each area in the SAMS model. The Status Quo run which allocated two trips to CAII (10 million pounds of landings from CAII-SW and EXT) would result in fishing in that area at an F of over 1.3 to achieve those trips. For the new alternatives being considered (Alternative 2 – 4), the range of the inner quartiles is similar for each DAS option (22 and 24) and there is variation in the median for those runs that comes from different F rates associated with access area fishing in Area II.

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 has been compared with estimated F rates from the most recent stock assessment, the hindcast or "realized" F has been above the average projected F (see Figure 25). Even so, overall F has remained well below the current FMSY.

Figure 18 - Comparison of total fishing mortality (F) estimates in FW36 Alternatives with the preferred alternatives from recent Frameworks.

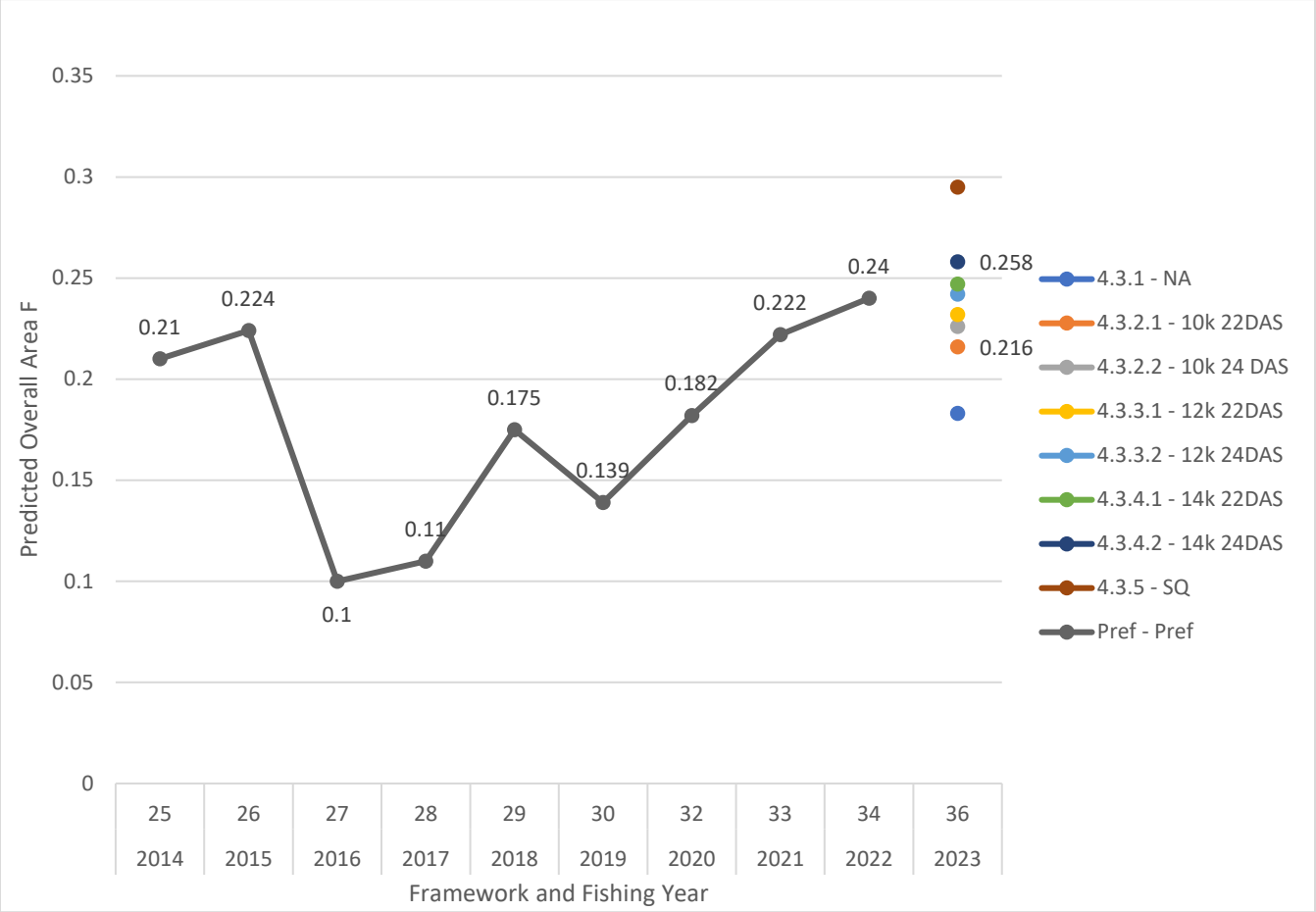


Figure 19 - Comparison of overall F over the Short Term and Long Term.

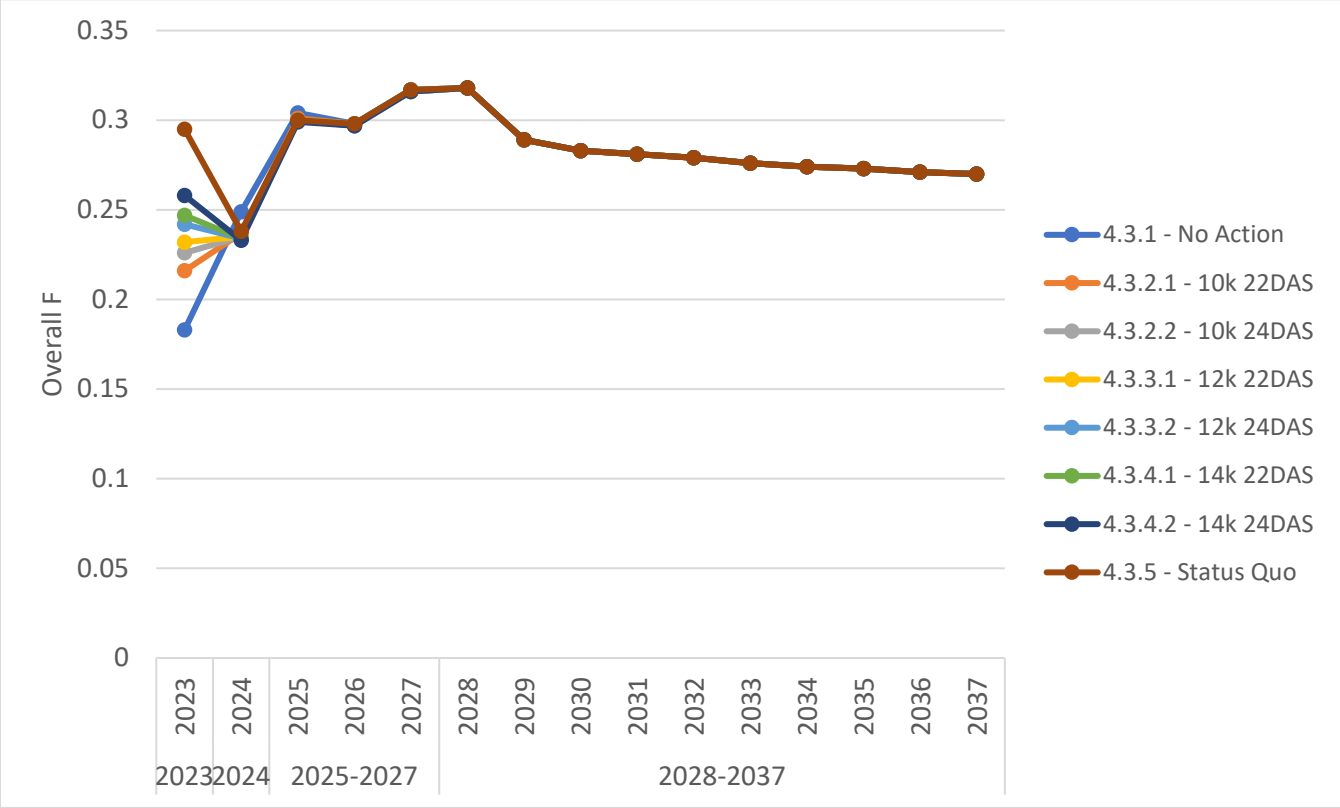
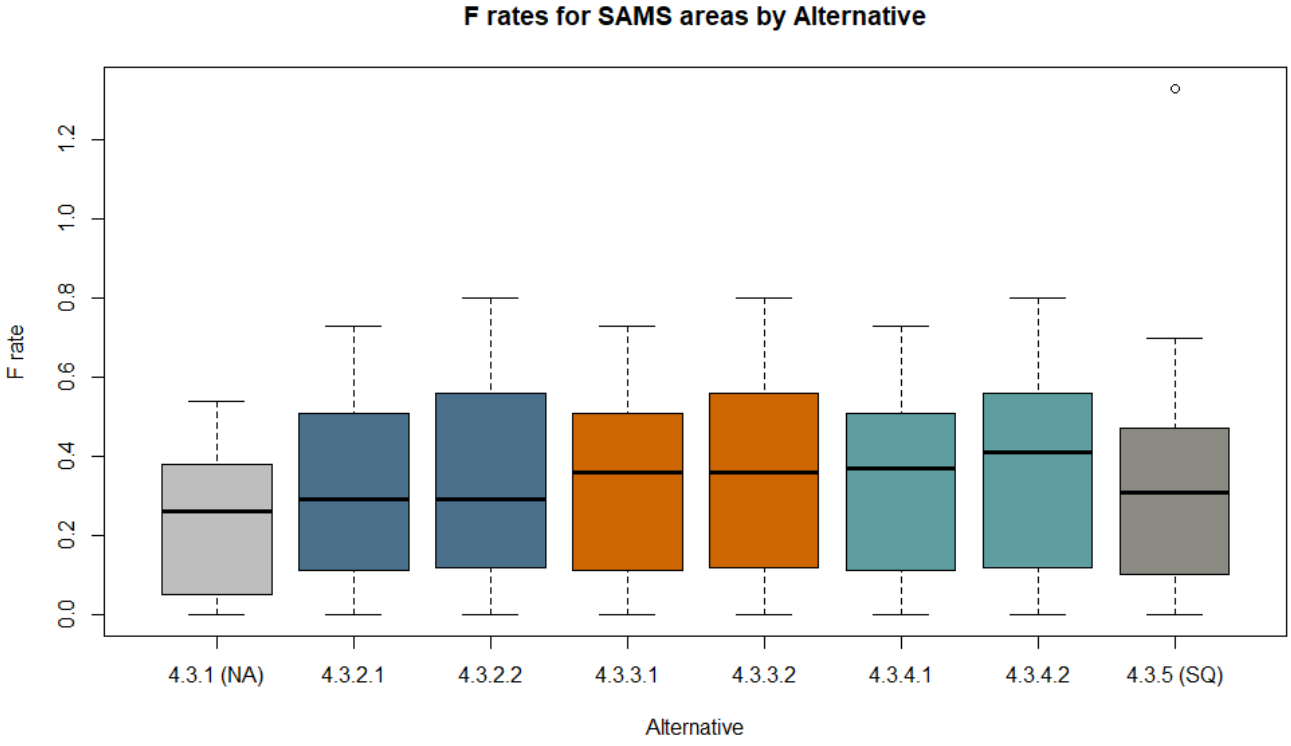


Figure 20 - Comparison of forecast F rates for all SAMS areas for alternatives in Action 3.



6.2.3.2 Open Area Fishing Mortality and Outlook

- Figure 21 provides a comparison of recent preferred F rates with options under consideration in FW36. Open area F rates are predicted to increase from the preferred option in FW34 when holding DAS constant at 24. FW36 considers DAS options that are estimated to result in the highest levels of open area F since FY2016. The last time open area F rate was recommended above F=0.5 was in FY2014. The declining trend in open area F between 2016 and 2019 came as most fishing was directed to rotational areas that became available through the partial approval of OHA2.
- The outlook for the resource has changed in recent years due to below average recruitment in the Mid-Atlantic since 2013, and average or below average recruitment on Georges Bank. Rotational fishing options are likely to be limited compared to the outlook immediately following the implementation of OHA2.
- 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 22). At 22 and 24 DAS, the model predicts F rates to be above 0.5 in Georges Bank areas. In the last stock assessment for scallops, open area F rates for Georges Bank were estimated to be above F=0.5 in 2019 for scallops greater than 120mm (Figure 23) whereas the average open area F (Mid-Atlantic and Georges Bank) was predicted to be F=0.23 (Figure 19). While the SAMS model appears to be accurately predicting that most open bottom fishing activity will be on Georges Bank, there is considerable uncertainty around predicting realized F rates by area and region, and recent experience has shown the model to underestimate F.

Figure 21 - Comparison of average open area fishing mortality (F) estimates in FW36 Alternatives with the preferred alternatives from recent Frameworks.

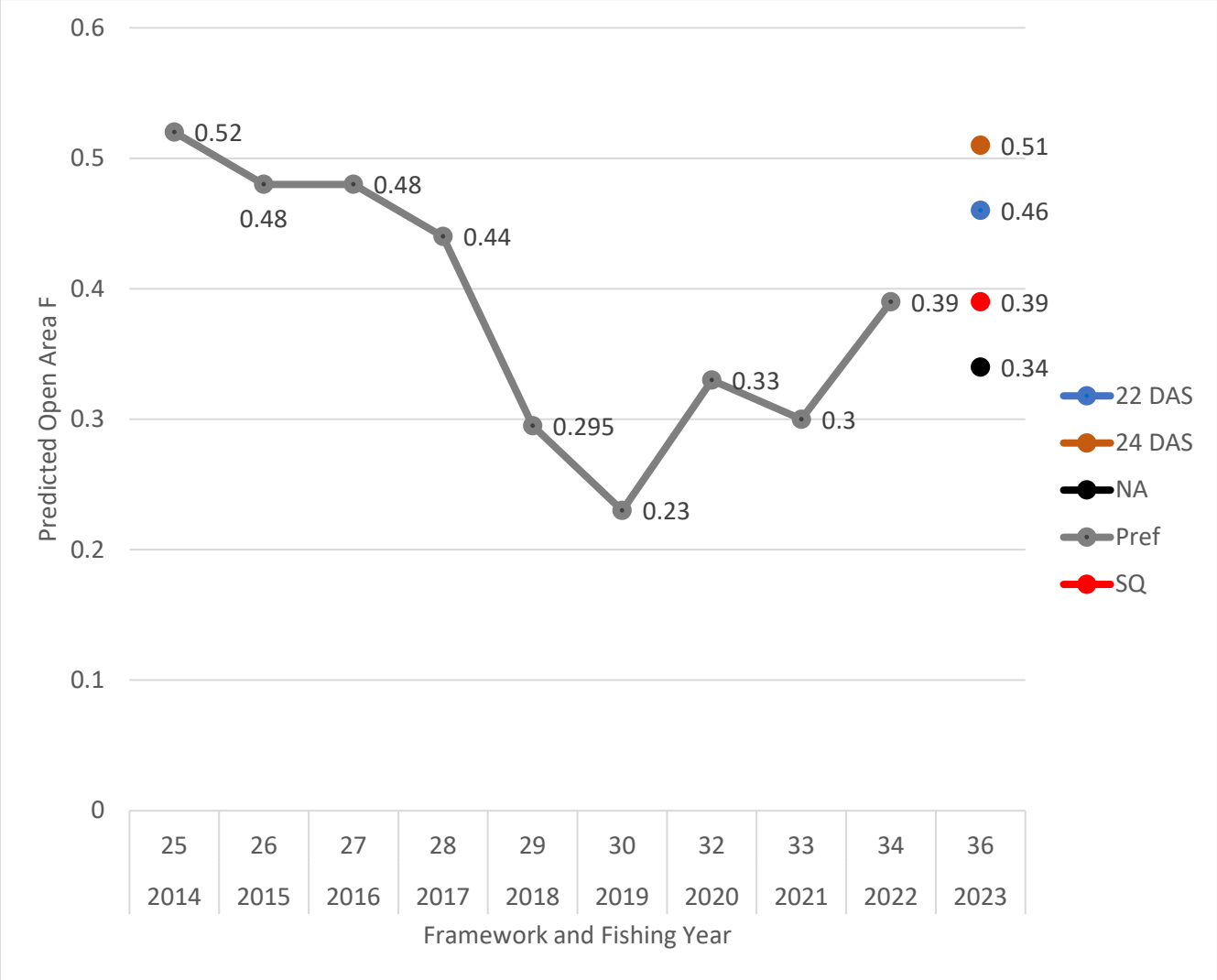


Figure 22 - Comparison of Open Bottom F rates by Region and DAS Options

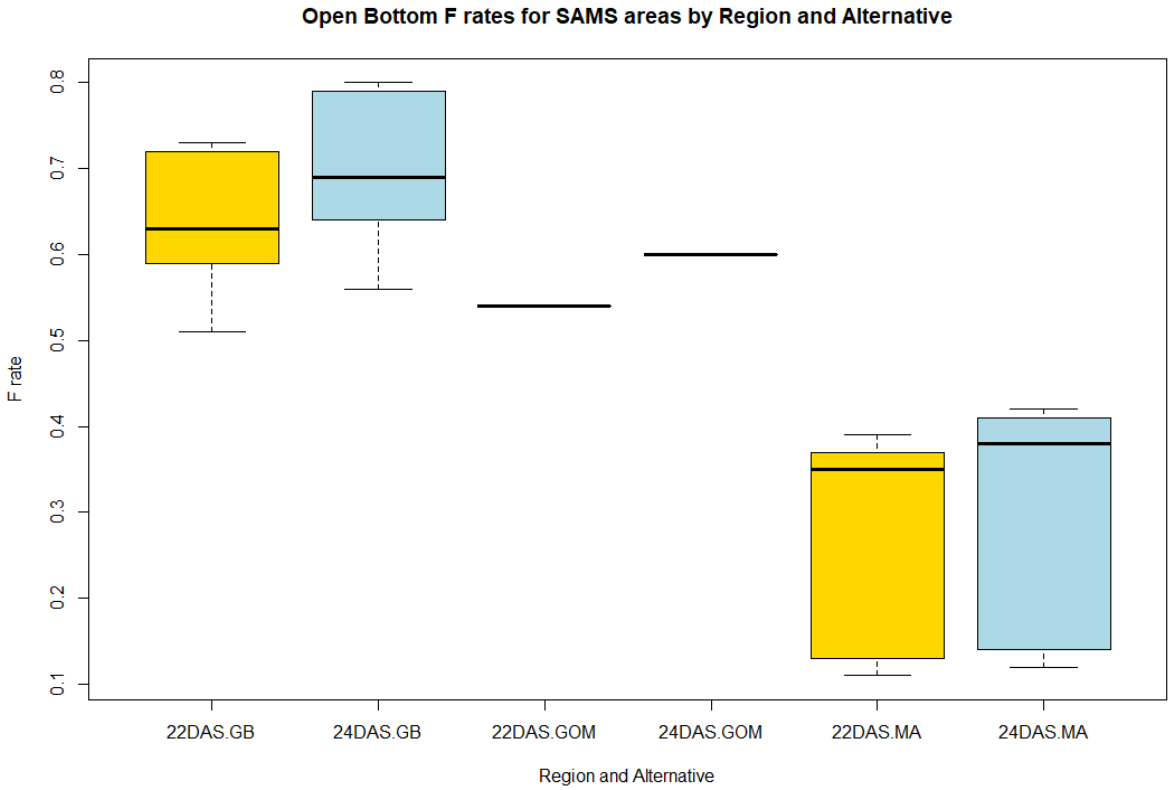
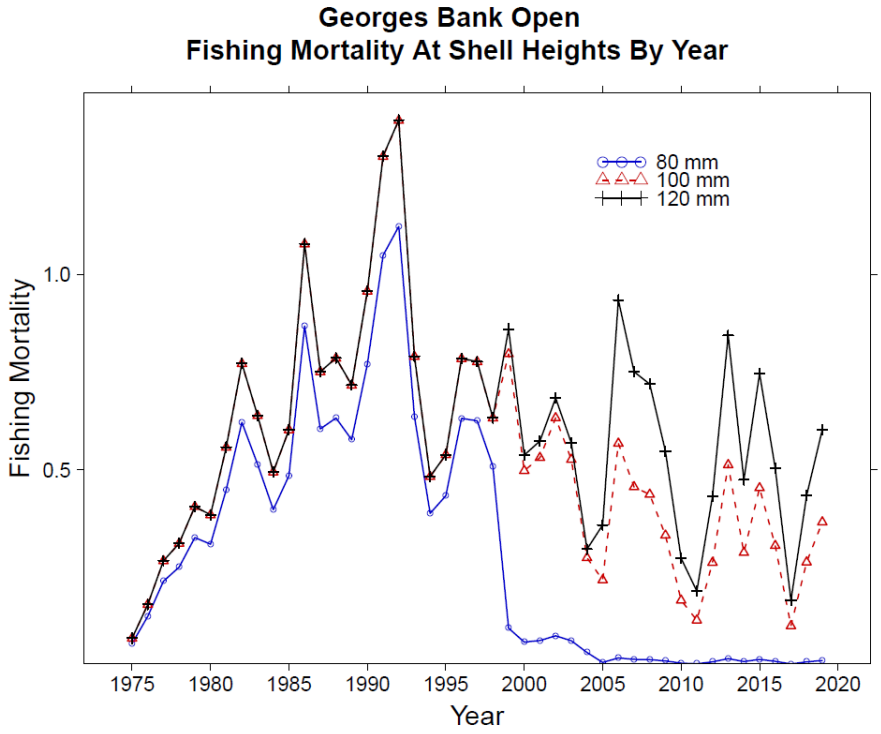


Figure 23 – 2020 Management Track Assessment estimates realized F for open bottom areas of Georges Bank for 80mm, 100mm, and 120mm shell-heights.



6.2.3.3 Projected Landings

Overall, the projected landings for the alternative runs under consideration are very similar (Figure 24). All options Framework 36 decrease overall landings compared to recent years. Alternative 2, 3, and 4 all allocate two access area trips for FY2023, meaning that differences in projected landings are driven by trip limits and DAS allocations. Total projected landings are likely to be between 47% (22 DAS and two 10,000 pounds trips in Area II) and 55% (24 DAS and two 14,000 pound trips to Area II) 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 next year to make recommendations for 2024. The uncertainty in projected landings is lower for year 1 but increases for 2024 and beyond. However, projections have been overly optimistic for parts of the resource in recent years (Figure 25).

Figure 24 - Projected landings for FW36 alternatives compared to the Council's preferred alternatives in recent actions (2014-2022).

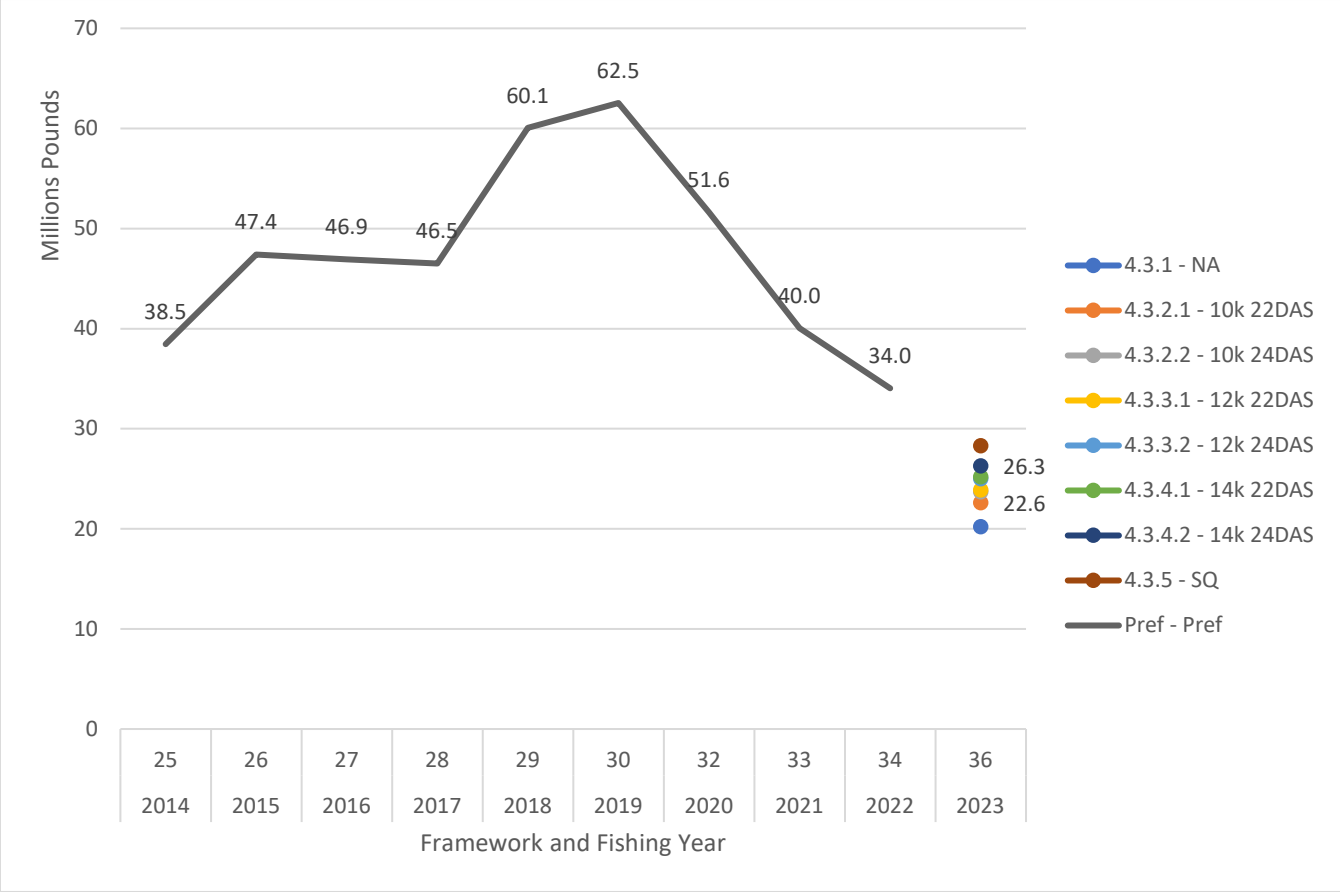
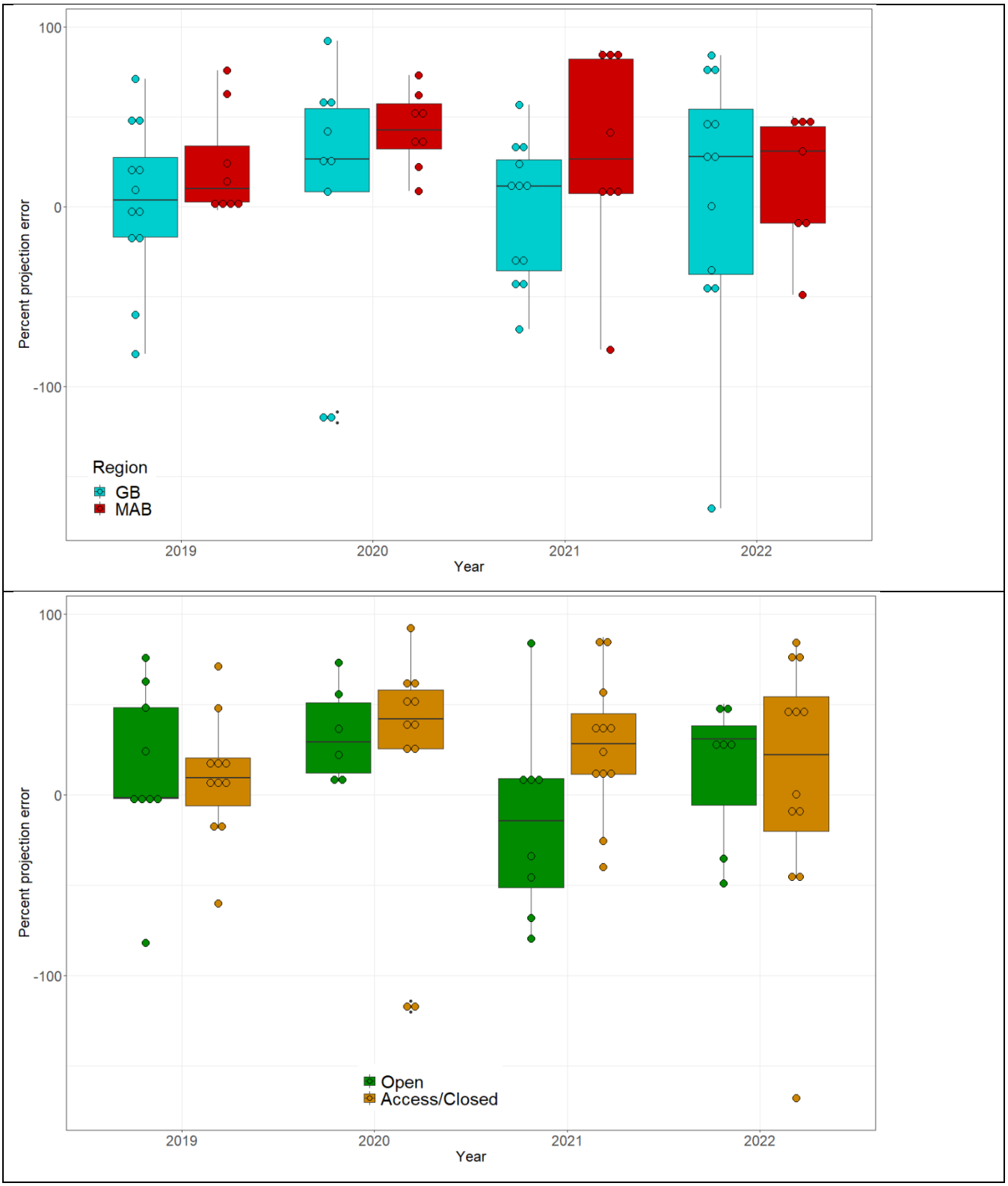


Figure 25 - Comparison of projection error for 2019 - 2022 by region (top) and access and open areas (bottom). The percent error is calculated as 100*(predicted-observed)/predicted.



6.2.4 Action 3 – Fishery Specifications and Rotational Management

The alternatives developed in this action set FY 2023 open area and access trip allocations for the LA and LAGC IFQ components of the fishery. Default specifications for FY 2024 are also established. The Council considered a total of four options. In addition to Alternative 1/No Action, three rotational management approaches (Alternatives 2-4) were developed, each with two options for open area F values that would result in either 22 or 24 DAS for full time limited access vessels.

For 2023, the Council is considering rotational fishing on eastern Georges Bank in a large rotational area (Area II) that combines the CAII-SW, SE, and EXT areas. This configuration would afford the fleet access to larger scallops in CAII-SE, which has been closed for two years, and will allow vessels to operate in a larger continuous area. The six year old cohort of scallops in Area II still have some growth potential. The projection model assumes that fishing effort will be distributed evenly across Area II; however, if the majority of harvest occurs in the SE portion of Area II, fishing mortality for that area will likely be underestimated, and biological impacts on the sea scallop resource in the ST and LT will be greater.

6.2.4.1 Alternative 1 – No Action

No Action would set FT LA DAS at 18 and allocate one 15,000-pound trip to the Closed Area II Access Area for full-time limited access vessels. This alternative is likely to reduce landings and area swept compared to all other alternatives and Status Quo. A 15,000 pound trip to the Closed Area II Access Area is expected to result in an F=0.41 for both the CAII-SW and CAII-EXT, which is between the F rates assumed for Alternatives 3 and 4 (F=0.36 and F=0.44). Setting DAS at 18 is likely to have a positive biological impact on open areas relative to Alternatives 2-4, particularly if the majority of fishing is on Georges Bank, while one 15,000-pound trip to Closed Area II Access Area could have negative impacts on the scallop resource in this area if projections continue to be overly optimistic and realized F is higher than expected.

6.2.4.2 Alternative 2 – Two access area trips in Area II with 10,000-pound trip limit

Alternative 2 would result in a low overall F rate depending on the option selected (F=0.22 or F=0.23), which is slightly lower than the overall F rates for Alternative 3 (F=0.23 or F=0.24) and Alternative 4 (F=0.25 and F=0.26). Harvesting two 10,000 pound trips from Area 2 could be expected to have slightly positive impacts on the scallop resource in Area 2 compared to Alternatives 3 and 4, particularly on scallops in the SE portion of the area where there are multiple year classes. All Alternatives and DAS options are expected to result in fishing mortality that is well below the OFL. With respect to open area F rates, F=0.46 (22 DAS) and F=0.51 (24 DAS) could result in slight negative biological impacts on the sea scallop resource relative to No Action (F=0.34). Since open area F rates are the average of all SAMS areas, the 24 DAS option could be expected to result in the highest F rates for Georges Bank areas.

6.2.4.3 Alternative 3 – Two access area trips in Area II with 12,000-pound trip limit (*Alternative 3 Option 2 is Preferred*)

Alternative 3 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 for Alternative 2, and slightly below the overall F rate for Alternative 4 (F=0.25 and F=0.26). Harvesting two 12,000 pound trips from Area 2 could be expected to have slightly positive impacts on the scallop resource in Area 2 compared to Alternative 4, particularly on scallops in the SE portion of the area where there are multiple year classes. Compared to Alternative 2, the Council's preferred alternative could be expected to have slight negative impacts on the scallop resource in Area 2. All Alternatives and DAS options are expected to result in fishing mortality that is well below the OFL. With respect to open area F rates, F=0.46 (22 DAS) and F=0.51 (24 DAS) could result in slight negative biological impacts to the scallop resource relative to

No Action (F=0.34). Since open area F rates are the average of all SAMS areas, the 24 DAS option could be expected to result in the highest F rates for Georges Bank areas.

6.2.4.4 Alternative 4 – Two access area trips in Area II with 14,000-pound trip limit

Alternative 4 would result in a relatively low overall F rate depending on the option selected (F=0.25 or F=0.26). Harvesting two 14,000 pound trips from Area 2 could be expected to have slightly negative impacts on the scallop resource in Area 2 compared to Alternatives 2 and 3, particularly on scallops in the SE portion of the area where there are multiple year classes. Both DAS options for Alternative 4 could be expected to result in an overall F rate that is slightly higher than F rates for both Alternatives 2 and 3. All Alternatives and DAS options are expected to result in fishing mortality that is well below the OFL. With respect to open area F rates, F=0.46 (22 DAS) and F=0.51 (24 DAS) could result in slight negative biological impacts on the sea scallop resource relative to No Action (F=0.34). Since open area F rates are the average of all SAMS areas, the 24 DAS option could be expected to result in the 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 would afford vessels the opportunity to fish the LAGC IFQ share of Area II allocations in both Area II and the NLS-North.

6.2.5.1 Alternative 1 – No Action (Default Measures from FW34)

Impacts of Alternative 1 are likely negligible at the stock level, but slight negative on the scallop resource in the Area I region of Georges Bank where strong recruitment was observed in the 2022 surveys. 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.

Following the implementation of Framework 36, Action 3 would close Area I to all fishing, thereby negating any LAGC IFQ rotational fishing in 2023 if Alternative 1 is selected. However, if there is a delay in the implementation of the framework, fishing in areas with large numbers of pre-recruits could have a slight negative impact on the scallop resource through incidental mortality. Under default measures, the LAGC IFQ fleet would have a limited number of trips in Area I (357 trips at 800 pounds per trip). If the fishery opens under default measures for FY2023, Alternative 1 would likely have a slight negative biological impact relative to Alternative 2 because fishing by the LAGC component could take place in areas where large numbers of pre-recruits with substantial growth potential were observed.

When considered in concert with Action 3 and the implementation of the framework on April 1, 2023, Alternative 1 could have slight negative to negligible impacts on the scallop resource because all LAGC IFQ fishing would be in open areas, which may or may not have higher catch rates than the available access areas for the LAGC IFQ.

6.2.5.2 Alternative 2 – Update LAGC IFQ Access Area Trip Allocations, Distribute Area II Access Area Allocation to the Nantucket Lightship North and Area II (*Preferred Alternative*)

This option could have negligible to potentially slight positive impacts on the resource overall by reducing fishing pressure on inshore open areas and providing access to areas with higher biomass and catch rates (Area II) as well as an area that holds lower densities of large scallops but has not been open to fishing in recent years (Nantucket Lightship North). Alternative 2 would likely have a slight positive to negligible biological impact on the resource relative to Alternative 1. 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 Area II to the NLS-North for the LAGC component.

6.3 IMPACTS ON NON-TARGET SPECIES (BYCATCH)

6.3.1 Action 1 – Overfishing Limit and Acceptable Biological Catch (*Alternative 2 is Preferred*)

The overfishing limit and acceptable biological catch are landings limits that 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 below the OFL and ABC values for both Alternative 1 (No Action, default OFL and ABC from FW34) and Alternative 2 (Updated OFL and ABC for FY2023 and FY2024). 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 FY2023 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. Given the above information, the impacts of Alternative 1 and Alternative 2 to non-target species are negligible overall and negligible in comparison to one another.

6.3.2 Action 2 – Northern Gulf of Maine Management and TAL Setting (*Alternative 2 Option 3 is Preferred*)

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. Bycatch projections for these two flatfish stocks under the NGOM TAL options are provided in Table 62. Bycatch projections are based on observed discard to kept (d/K) ratios from observed LAGC trips in the NGOM in FY2022 (i.e., the first year where observer coverage was required for the NGOM). Note that projections are provided for Option 1 and Option 2, but not Option 3 and Option 4, though bycatch for all options is expected to be similar (i.e., less than 0.5 mt). All projections could be over-estimated because landings in the NGOM will be reduced in FY2023 to account for an overage in FY 2021.

For Alternative 1 and all options being considered under 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 (i.e., less than ~1% of total projected bycatch for CC/GOM yellowtail and less than ~0.5% for northern windowpane). 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 62 – Comparison CC/GOM yellowtail and northern windowpane bycatch projections for the NGOM management area in FY2023, based on NGOM TAL Alternative 2 Options 1 and 2.

FW36 Alt	F rate	NGOM TAL (lbs)	NWP bycatch (mt)	CC/GOM YT bycatch (mt)
Alternative 2 Op 1	F=0.15, biomass from Stellwagen only	357,149	0.18	0.40
Alternative 2 Op 2	F=0.18, biomass from Stellwagen only	421,083	0.21	0.47

6.3.3 Action 3 – Fishery Specifications and Rotational Management (*Alternative 3 Option 2 is Preferred*)

The alternatives under this action set FY2023 open area and access trip allocations for the fishery. Default specifications for FY2024 are also established. The Council considered a total of three allocation options in addition to Alternative 1/No Action. The action alternatives (Alternatives 2 - 4) offer three access area allocation options, each with two options for open area F values. The access area options include two 10,000 pound trips to Area II (Alternative 2), two 12,000 pound trips to Area II (Alternative 3), and two 14,000 pound trips to Area II (Alternative 4). Alternatives 2 – 4 also consider options for 22 DAS (F=0.46) and 24 DAS (F=0.51). No Action includes default open area DAS set through FW34 (i.e., 18 DAS for FT LA vessels). 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 FY2022 specifications for FY2023 (i.e., considering changes in biomass that have occurred). The rotational access areas open under status quo differ from the action alternatives.

Table 63 shows the FY2023 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. A description of the flatfish bycatch outlook for FY2023 and discussion around projections relative to anticipated catch limits for these stocks is included in the November 28, 2022 memo from the Scallop PDT to the Groundfish PDT.

Table 63 – Overview of FY2023 projected scallop fishery bycatch estimates for the range of alternatives being considered in FW36, including the anticipated FY2023 scallop sub-ACL for each stock.

Alternative	Scenario		GB YT	SNE/MA YT	GOM/GB WP	SNE/MA WP
Anticipated 2023 sub-ACL		GB Closure	*16.5 mt*	*2 mt*	*31 mt*	*129 mt*
Alt. 1	No Action 1 15,000 pound trip to CAII 18 DAS	CAII East	8	2	86	7
Alt. 2	2 trips to Area II AA at 10,000 per trip (20K total) 22 or 24 DAS New York Bight, Elephant Trunk, Area I, NLS-West Closed	Area II seasonal closure (Aug 15-Nov 15)	32	3	106-112	38-41
Alt. 3 (*Pref.*)	2 trips to Area II AA at 12,000 per trip (24K total) 22 or 24 DAS New York Bight, Elephant Trunk, Area I, NLS-West Closed	Area II seasonal closure (Aug 15-Nov 15)	38	3	112-119 (pref. 119)	38-41 (pref. 41)
Alt. 4	2 trips to Area II AA at 14,000 per trip (28K total) 22 or 24 DAS New York Bight, Elephant Trunk, Area I, NLS-West Closed	Area II seasonal closure (Aug 15-Nov 15)	45	3	119-126	38-41

6.3.3.1 Alternative 1 – No Action

Alternative 1 sets default specifications from Framework 34, which equate to one (1) 15,000 pound trip to Closed Area II Access Area and 18 days-at-sea for full time limited access vessels. The scallop fishery is not expected to exceed the limit of any flatfish stocks that it has sub-ACLs for under Alternative 1 (Table 63), except for northern windowpane. While the northern windowpane projection is greater than the sub-ACL, the projections are highly uncertain for the reasons described in Section 5.3.1. Also as discussed in the following sections, northern windowpane bycatch by the scallop fishery is not expected to cause the stock-wide ABC for this stock to be exceeded, meaning the overall impact of Alternative 1 to northern windowpane are expected to be negligible.

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 to non-target species is expected to be negligible. Given the similarities in all options with respect to potential bycatch, the impacts of Alternative 1 are expected to be negligible in comparison to Alternative 2, Alternative 3, and Status Quo.

6.3.3.2 Alternative 2 – Two access area trips in Area II with 10,000-pound trip limit

Alternative 2 would allocate two 10,000-pound trips to Area II access area for full-time limited access vessels and either 22 DAS (Option 1) or 24 DAS (Option 2).

Bycatch projections associated with Alternative 2 Option 1 and Alternative 2 Option 2 are very similar for each flatfish stock and are analyzed collectively in the following text. As described in Table 63, bycatch projections for FY2023 under Alternative 2 are at or below the anticipated scallop fishery sub-ACL for SNE/MA yellowtail and southern windowpane. Considering that projected bycatch is expected to be at or below the sub-ACLs for these stocks, and that the bycatch by the scallop fishery is not expected to cause the stock-wide limits for these flatfish stocks to be exceeded, the overall impact of Alternative 2 on SNE/MA yellowtail and southern windowpane would likely be negligible.

The GB yellowtail projections are about double the anticipated sub-ACL of 16.5 mt and the northern windowpane projections are about 3 to 4 times greater than the anticipated sub-ACL of 31 mt (Table 63). The projections are forecasts (with error) and should not be interpreted as precise estimates. Realized bycatch may be higher or lower than forecasted, which is supported by previous experiences where past estimates have both over- and under-estimated realized bycatch.

In FY2023 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 Area II, which is on eastern Georges Bank; 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 area closures being considered in Framework 36 for the New York Bight and Elephant Trunk 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) and Northern Flank (NF) SAMS areas 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 from the SAMS model. For example, if there is more open bottom fishing in the Mid-Atlantic than expected, bycatch of southern windowpane flounder may be higher than forecasted 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, which could result in error as high as 50% (i.e., bycatch projections could be 50% higher or lower than estimated).

As shown in Table 64, roughly 70% of FY2023 northern windowpane bycatch is attributed to open area fishing on eastern Georges Bank (i.e., SF and NF SAMS areas) and in the Great South Channel (i.e., GSC SAMS area). This is consistent with the spatial distribution of open area effort over the past year given that the majority of open area biomass continues to be concentrated on Georges Bank. About 21% of northern windowpane bycatch is projected to come from the GSC SAMS area, which falls in both the northern windowpane and southern windowpane stock areas. Based on assumptions of fishing behavior in FY2023, the projections assume that 80% of windowpane bycatch in the GSC comes from the northern stock area whereas 20% is assumed to come from the southern stock area. If assumptions of open area fishing in the GSC are incorrect, for example if more fishing occurs in the southern stock area than expected, northern windowpane bycatch could be lower than projected and southern windowpane bycatch could be higher.

Bycatch projections are also driven by assumptions of where fishing will occur within an access area. In the case of Area II, observed D:K ratios suggest that GB yellowtail bycatch tends to be higher in the eastern portion of the access area (i.e., CAII-East SAMS area) and that northern windowpane bycatch tends to be higher in the western portion of the access area (CAII-Southwest). While the FY2023 projections assume that fishing effort will be distributed evenly across the three SAMS areas that make up Area II (i.e., CAII-Southwest, CAII-East, CAII-Extension), if realized effort is focused more in the eastern part of Area II (which is currently closed), GB yellowtail bycatch could be greater than projected and northern windowpane bycatch could be less than projected.

In a scenario where fishing is focused more in the western part of Area II, northern windowpane bycatch could be higher than projected whereas GB yellowtail bycatch could be lower than projected.

The northern windowpane bycatch projections for FY2023 exceed the anticipated scallop fishery sub-ACL and are similar to the bycatch projections for FY2022 (106 mt – 126 mt in 2023 vs. 86 mt – 115 mt in 2022). Due to recent overages, the reactive large accountability measure for Georges Bank was triggered for FY2022 and is anticipated to be implemented for FY2023 as well. This means the gear restriction was required for all fishing occurring in Area II for the entirety of FY2022 and is expected to be required again in FY2023. The modified gear is expected to have a positive effect on bycatch of both Georges Bank yellowtail and northern windowpane flounder.

The reactive AM gear requirement has been in use for the first time since the start of FY2022 and is anticipated to be required for the duration of FY2023. Experimental work on the modified gear suggested that windowpane bycatch could be reduced by roughly 46% and yellowtail bycatch could be reduced by roughly 34%. Since observer data used to project FY2023 bycatch are from July 2021 to June 2022, observer data used for the projections are mostly representative of fishing in Area II without the modified gear. Thus, it is possible that the projections presented in Table 63 could be as much as 46% lower for windowpane and 34% lower for yellowtail in Area II where the modified gear is required. Table 64 shows the breakdown of projected bycatch by SAMS area for the Council's preferred specifications alternative, Alternative 3 Option 2 (two 12,000-pound trips with 24 DAS), and a separate breakdown that adjusts the Area II projections based on the bycatch savings expected by using the AM gear modification (i.e., 46% reduction for windowpane, 34% reduction for yellowtail). As shown in the table, adjusting bycatch by the gear reduction values results in an overall reduction in northern windowpane bycatch by roughly 14% and a reduction of roughly 30% for GB yellowtail.

Despite the projection for northern windowpane and GB yellowtail exceeding the FY2023 sub-ACL, this level of bycatch is not expected to cause the overall ACL for these stocks to be exceeded under Alternative 2, 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 FY2023 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 2 to non-target species is expected to be negligible. Given the similarities in all options with respect to potential bycatch, the impacts of Alternative 2 are expected to be negligible in comparison to Alternative 1, Alternative 3, and Alternative 4.

Table 64 - Estimated FY2023 bycatch for GB yellowtail and northern windowpane from Alternative 3 with 24 DAS, by SAMS area (mt). Bycatch values are also shown with reduction parameters applied from fishing the AM gear modification in Area II (i.e., 46% reduction for windowpane, 34% reduction for yellowtail).

	CA2-SE	CA2-SW	CA2-Ext	GSC	NF	SF	Total
Georges Bank Yellowtail Flounder							
2023	30	3	2	1	2	1	38
With AM gear (34% reduction in Area II)	20	2	1	1	2	1	27
Northern Windowpane Flounder							
2023	12	10	15	25	26	31	119
With AM gear (46% reduction in Area II)	7	5	8	25	26	31	102

6.3.3.3 Alternative 3 – Two access area trips in Area II with 12,000-pound trip limit (*Alternative 3 Option 2 is Preferred*)

Alternative 3 would allocate two 12,000-pound trips to Area II access area for full-time limited access vessels and either 22 DAS (Option 1) or 24 DAS (Option 2). The Council selected Alternative 3 Option 2 as the preferred alternative.

Bycatch projections associated with Alternative 3 Option 1 and Alternative 3 Option 2 are very similar for each flatfish stock and are analyzed collectively in the following text. As described in Table 63, bycatch projections for FY2023 under Alternative 3 are at or below the anticipated scallop fishery sub-ACL for SNE/MA yellowtail and southern windowpane. Considering that projected bycatch is expected to be at or below the sub-ACLs for these stocks, and that the bycatch by the scallop fishery is not expected to cause the stock-wide limits for these flatfish stocks to be exceeded, the overall impact of Alternative 3 on SNE/MA yellowtail and southern windowpane would likely be negligible.

The GB yellowtail projections are about double the anticipated sub-ACL of 16.5 mt and the northern windowpane projections are about 3 to 4 times greater than the anticipated sub-ACL of 31 mt (Table 63). The projections are forecasts (with error) and should not be interpreted as precise estimates. Realized bycatch may be higher or lower than forecasted, which is supported by previous experiences where past estimates have both over- and under-estimated realized bycatch.

In FY2023 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 Area II, which is on eastern Georges Bank; 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 area closures being considered in Framework 36 for the New York Bight and Elephant Trunk 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) and Northern Flank (NF) SAMS areas 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 from the SAMS model. For example, if there is more open bottom fishing in the Mid-Atlantic than expected, bycatch of southern windowpane flounder may be higher than forecasted 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, which could result in error as high as 50% (i.e., bycatch projections could be 50% higher or lower than estimated).

As shown in Table 64, roughly 70% of FY2023 northern windowpane bycatch is attributed to open area fishing on eastern Georges Bank (i.e., SF and NF SAMS areas) and in the Great South Channel (i.e., GSC SAMS area). This is consistent with the spatial distribution of open area effort over the past year given that the majority of open area biomass continues to be concentrated on Georges Bank. About 21% of northern windowpane bycatch is projected to come from the GSC SAMS area, which falls in both the northern windowpane and southern windowpane stock areas. Based on assumptions of fishing behavior in FY2023, the projections assume that 80% of windowpane bycatch in the GSC comes from the northern stock area whereas 20% is assumed to come from the southern stock area. If assumptions of open area fishing in the GSC are incorrect, for example if more fishing occurs in the southern stock area than expected, northern windowpane bycatch could be lower than projected and southern windowpane bycatch could be higher.

Bycatch projections are also driven by assumptions of where fishing will occur within an access area. In the case of Area II, observed D:K ratios suggest that GB yellowtail bycatch tends to be higher in the eastern portion of the access area (i.e., CAII-East SAMS area) and that northern windowpane bycatch tends to be higher in the western portion of the access area (CAII-Southwest). While the FY2023 projections assume that fishing effort will be distributed evenly across the three SAMS areas that make up Area II (i.e., CAII-Southwest, CAII-East, CAII-

Extension), if realized effort is focused more in the eastern part of Area II (which is currently closed), GB yellowtail bycatch could be greater than projected and northern windowpane bycatch could be less than projected. In a scenario where fishing is focused more in the western part of Area II, northern windowpane bycatch could be higher than projected whereas GB yellowtail bycatch could be lower than projected.

The northern windowpane bycatch projections for FY2023 exceed the anticipated scallop fishery sub-ACL and are similar to the bycatch projections for FY2022 (106 mt – 126 mt in 2023 vs. 86 mt – 115 mt in 2022). Due to recent overages, the reactive large accountability measure for Georges Bank was triggered for FY2022 and is anticipated to be implemented for FY2023 as well. This means the gear restriction was required for all fishing occurring in Area II for the entirety of FY2022 and is expected to be required again in FY2023. The modified gear is expected to have a positive effect on bycatch of both Georges Bank yellowtail and northern windowpane flounder.

The reactive AM gear requirement has been in use for the first time since the start of FY2022 and is anticipated to be required for the duration of FY2023. Experimental work on the modified gear suggested that windowpane bycatch could be reduced by roughly 46% and yellowtail bycatch could be reduced by roughly 34%. Since observer data used to project FY2023 bycatch are from July 2021 to June 2022, observer data used for the projections are mostly representative of fishing in Area II without the modified gear. Thus, it is possible that the projections presented in Table 63 could be as much as 46% lower for windowpane and 34% lower for yellowtail in Area II where the modified gear is required. Table 64 shows the breakdown of projected bycatch by SAMS area for the Council's preferred specifications alternative, Alternative 3 Option 2 (two 12,000-pound trips with 24 DAS), and a separate breakdown that adjusts the Area II projections based on the bycatch savings expected by using the AM gear modification (i.e., 46% reduction for windowpane, 34% reduction for yellowtail). As shown in the table, adjusting bycatch by the gear reduction values results in an overall reduction in northern windowpane bycatch by roughly 14% and a reduction of roughly 30% for GB yellowtail.

Despite the projection for northern windowpane and GB yellowtail exceeding the FY2023 sub-ACL, this level of bycatch is not expected to cause the overall ACL for this stock to be exceeded under Alternative 3, meaning the overall impact to these stocks 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 FY2023 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 3 to non-target species is expected to be negligible. Given the similarities in all options with respect to potential bycatch, the impacts of Alternative 3 are expected to be negligible in comparison to Alternative 1, Alternative 2, and Alternative 4.

6.3.3.4 Alternative 4 – Two access area trips in Area II with 14,000-pound trip limit

Alternative 4 would allocate two 14,000-pound trips to Area II access area for full-time limited access vessels and either 22 DAS (Option 1) or 24 DAS (Option 2).

Bycatch projections associated with Alternative 4 Option 1 and Alternative 4 Option 2 are very similar for each flatfish stock and are analyzed collectively in the following text. As described in Table 63, bycatch projections for FY2023 under Alternative 4 are at or below the anticipated scallop fishery sub-ACL for SNE/MA yellowtail and southern windowpane. Considering that projected bycatch is expected to be at or below the sub-ACLs for these stocks, and that the bycatch by the scallop fishery is not expected to cause the stock-wide limits for these flatfish stocks to be exceeded, the overall impact of Alternative 3 on SNE/MA yellowtail and southern windowpane would likely be negligible.

The GB yellowtail projections are about double the anticipated sub-ACL of 16.5 mt and the northern windowpane projections are about 3 to 4 times greater than the anticipated sub-ACL of 31 mt (Table 63). The projections are forecasts (with error) and should not be interpreted as precise estimates. Realized bycatch may be higher or lower than forecasted, which is supported by previous experiences where past estimates have both over- and under-estimated realized bycatch.

In FY2023 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 Area II, which is on eastern Georges Bank; 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 area closures being considered in Framework 36 for the New York Bight and Elephant Trunk 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) and Northern Flank (NF) SAMS areas 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 from the SAMS model. For example, if there is more open bottom fishing in the Mid-Atlantic than expected, bycatch of southern windowpane flounder may be higher than forecasted 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, which could result in error as high as 50% (i.e., bycatch projections could be 50% higher or lower than estimated).

As shown in Table 64, roughly 70% of FY2023 northern windowpane bycatch is attributed to open area fishing on eastern Georges Bank (i.e., SF and NF SAMS areas) and in the Great South Channel (i.e., GSC SAMS area). This is consistent with the spatial distribution of open area effort over the past year given that the majority of open area biomass continues to be concentrated on Georges Bank. About 21% of northern windowpane bycatch is projected to come from the GSC SAMS area, which falls in both the northern windowpane and southern windowpane stock areas. Based on assumptions of fishing behavior in FY2023, the projections assume that 80% of windowpane bycatch in the GSC comes from the northern stock area whereas 20% is assumed to come from the southern stock area. If assumptions of open area fishing in the GSC are incorrect, for example if more fishing occurs in the southern stock area than expected, northern windowpane bycatch could be lower than projected and southern windowpane bycatch could be higher.

Bycatch projections are also driven by assumptions of where fishing will occur within an access area. In the case of Area II, observed D:K ratios suggest that GB yellowtail bycatch tends to be higher in the eastern portion of the access area (i.e., CAII-East SAMS area) and that northern windowpane bycatch tends to be higher in the western portion of the access area (CAII-Southwest). While the FY2023 projections assume that fishing effort will be distributed evenly across the three SAMS areas that make up Area II (i.e., CAII-Southwest, CAII-East, CAII-Extension), if realized effort is focused more in the eastern part of Area II (which is currently closed), GB yellowtail bycatch could be greater than projected and northern windowpane bycatch could be less than projected. In a scenario where fishing is focused more in the western part of Area II, northern windowpane bycatch could be higher than projected whereas GB yellowtail bycatch could be lower than projected.

The northern windowpane bycatch projections for FY2023 exceed the anticipated scallop fishery sub-ACL and are similar to the bycatch projections for FY2022 (106 mt – 126 mt in 2023 vs. 86 mt – 115 mt in 2022). Due to recent overages, the reactive large accountability measure for Georges Bank was triggered for FY2022 and is anticipated to be implemented for FY2023 as well. This means the gear restriction was required for all fishing occurring in Area II for the entirety of FY2022 and is expected to be required again in FY2023. The modified gear is expected to have a positive effect on bycatch of both Georges Bank yellowtail and northern windowpane flounder.

The reactive AM gear requirement has been in use for the first time since the start of FY2022 and is anticipated to be required for the duration of FY2023. Experimental work on the modified gear suggested that windowpane bycatch could be reduced by roughly 46% and yellowtail bycatch could be reduced by roughly 34%. Since observer data used to project FY2023 bycatch are from July 2021 to June 2022, observer data used for the projections are mostly representative of fishing in Area II without the modified gear. Thus, it is possible that the projections presented in Table 63 could be as much as 46% lower for windowpane and 34% lower for yellowtail in Area II where the modified gear is required. Table 64 shows the breakdown of projected bycatch by SAMS

area for the Council's preferred specifications alternative, Alternative 3 Option 2 (two 12,000-pound trips with 24 DAS), and a separate breakdown that adjusts the Area II projections based on the bycatch savings expected by using the AM gear modification (i.e., 46% reduction for windowpane, 34% reduction for yellowtail). As shown in the table, adjusting bycatch by the gear reduction values results in an overall reduction in northern windowpane bycatch by roughly 14% and a reduction of roughly 30% for GB yellowtail.

Despite the projection for northern windowpane and GB yellowtail exceeding the FY2023 sub-ACL, this level of bycatch is not expected to cause the overall ACL for this stock to be exceeded under Alternative 4, meaning the overall impact to these stocks 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 FY2023 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 4 to non-target species is expected to be negligible. Given the similarities in all options with respect to potential bycatch, the impacts of Alternative 4 are expected to be negligible in comparison to Alternative 1, Alternative 2, and Alternative 3.

6.3.4 Action 4 – Access Area Trip Allocations to the LAGC IFQ Component (*Alternative 2 is Preferred*)

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 is 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.

Under Alternative 1 (No Action) the LAGC IFQ component would be allocated 357 trips to Area I, which is the default number of trips allocated through Framework 34. Note that all action alternatives in Action 3 (Section 4.3), including the Council's preferred Alternative (4.3.3.2) close Area I to scallop fishing, meaning even if this alternative was selected and trips were allocated to Area I, LAGC IFQ vessels would not be able to fish them. Under Alternative 2, a range of access area trips could be allocated to the LAGC IFQ component depending on the specifications option selected in Action 3 (Section 4.3). Under Alternative 2, a total of 476, 571, or 666 access area trips could be allocated to the LAGC IFQ component in FY2023, corresponding to Alternative 4.3.2, Alternative 4.3.3, and Alternative 4.3.4, respectively (Table 10). Alternative 2 would allocate a total number of trips that could be fished in either the Nantucket Lightship North and(or) Area II. Once the total number of trips is taken, LAGC IFQ vessels will no longer be allowed to fish access area trips in either area. The LAGC IFQ component will continue to have access to the Nantucket Lightship North as part of the open bottom after the total trip allocation has been taken. Alternative 2 also reverts the Nantucket Lightship North to open bottom for the LA component after the first 90 days of FY2023.

Under Alternative 2, should vessels choose to fish in Area II, vessels will likely be able to harvest the possession limit in less time compared to fishing in the NLS-North and(or) open bottom because there are high densities of scallops in Area II. Even in a scenario where vessels choose to fish in Area II, where GB yellowtail and northern windowpane bycatch tends to be higher than other parts of the resource, fishing in an area with high densities would mean lower area swept and therefore lower bycatch. Given the choice between fishing in Area II or the Nantucket Lightship North, it is more likely that LAGC IFQ vessels will fish in the Nantucket Lightship North due to the considerably longer steam time associated with trips to Area II, even if catch rates are not as high in the Nantucket Lightship North. Catch rates in the Nantucket Lightship North could be similar or slightly higher than what is anticipated for open trips, meaning allowing LAGC IFQ vessels to fish access area trips in the NLS-North could also have some slight benefits to non-target flatfish stocks in that area swept and time with gear in the water could be slightly reduced. Additionally, bycatch associated with trips in the NLS-North would be attributed to the SNE/MA yellowtail and southern windowpane stocks, which the fishery is projected to catch lower levels of and

is not expected to exceed the respective sub-ACLs.

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 and Alternative 2 are expected to be negligible overall, as well as negligible in comparison to one another.

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 FY2023 and FY2024 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 19,828 mt for FY2023. This is 5,896 mt (23%) 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 2023 fishing year. Regardless of this influx of biomass to the fishery, the OFL, ABC, and ACL values set by the Council are often higher than the projected landings by the fishery (e.g., in this action, all alternatives in Section 4.3 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), the level of negative impacts to ESA listed species of sea turtles and Atlantic sturgeon is expected to be slight. Support for this determination is provided below.

Under "No Action", the overall OFL and ABC would be at the default values for FY2023, which were adopted by the Council through FW34. The No Action ABC including discards is 27,606 mt or about 61 million pounds. The No Action OFL including discards is 34,941 mt or roughly 77 million pounds. The ABC and OFL under Alternative 1 (No Action) are the lowest values that were authorized for the fishery since 2014 (Table 65). As biomass of the scallop resource affect the OFL and ABC, and these resource conditions can vary from year to year, it is likely that fishing effort under the No Action OFL and ABC will be no greater than effort seen under the most recent values authorized in the fishery (i.e., 2017 through 2022). In addition, the OFL and ABC are not a direct measure of the Annual Projected Landings (APL) for the scallop fishery and therefore, the values in and of themselves are not a direct measure of expected fishing behavior or effort under such specifications. Instead these values represent the legal limits for the fishery based on biomass throughout the range of the resource and the overfishing level updated through the 2020 scallop stock assessment (F=0.61) (NEFSC 2020). Projected landings

are anticipated to be much lower than the OFL/ABC values under No Action and Alternative 2, and impacts of the projected landings resulting from specification alternatives in Section 4.3 (i.e., day-at-sea and access area allocations) are described in Section 6.4.3.

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, relative to current operating conditions in the fishery, the No Action is not expected to introduce new or elevated interaction risks to ESA listed species of sea turtles or 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.

6.4.1.2 Alternative 2 – Updated OFL and ABC for FY2023 and FY2024 (default) (*Preferred Alternative*)

The OFL and ABC values approved by the SSC for FY2023 and FY2024 (default) under Alternative 2 are summarized in Table 4. The updated OFL including discards is 27,504 mt (approximately 61 million pounds) and the updated ABC including discards is 22,631 mt (approximately 50 million pounds). The updated OFL and ABC represent a reduction from No Action by 7,437 mt and 4,975 mt, respectively. Survey results from 2022 suggest a continued decline in scallop biomass, with overall biomass estimated to be at its lowest level since 1999. The trend is likely driven by larger year classes of scallops being fished down in tandem with several years of below average recruitment.

Under Alternative 2, the proposed OFL and ABC for FY2023 and FY2024 are lower than the range of ABC and OFL values that were authorized by the fishery over the past 12 years (Table 65). The trends in the ABC and OFL since 2017 (i.e., increases between FY2017 and FY2019; roughly similar values between FY2019 and FY2020; and a reduction between FY2020, FY2021, FY2022, and FY2023) reflect the higher estimates of scallop biomass observed in recent surveys of the scallop resource and the leveling off and steady decline of scallop biomass as the large year classes continued to be fished with a lack of subsequent recruitment. As biomass of the scallop resource affect the OFL and ABC, and these resource conditions can vary from year to year, it is likely that fishing effort under the Alternative 2 OFL and ABC will be no greater than effort seen under the most recent values authorized in the fishery (i.e., 2017 through 2022). In addition, the OFL and ABC are not a direct measure of the Annual Projected Landings (APL) for the scallop fishery and therefore, the values in and of themselves are not a direct measure of expected fishing behavior or effort under such specifications. Instead, these values represent the legal limits for the fishery based on biomass throughout the range of the resource and the overfishing level updated through the 2020 scallop stock assessment (F=0.61) (NEFSC 2020). Projected landings are anticipated to be much lower than the OFL/ABC values under both No Action and Alternative 2; impacts of the projected landings resulting from specification alternatives in Section 4.3 (i.e., day-at-sea and access area allocations) are described in more detail in Section 6.3.3.

Fishery allocations are projected to result in significantly lower landings than the OFL and ABC limits under Alternative 2 and are lower than projected landings in recent history. 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. 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

Table 65 – Overfishing limit (OFL) and acceptable biological catch (ABC) values (mt) from fishing year 2011 to 2022, with 2023 and 2024 values.

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
2022	38,271	30,305
2023	27,504	22,631
2024	29,151	23,289

6.4.2 Action 2 - Northern Gulf of Maine Management and TAL Setting

6.4.2.1 Alternative 1 – No Action

Under No Action, the default specifications approved in Framework 34 for the NGOM Set-Aside (465,980 pounds) would be in place for the 2023 fishing year. However, in FY2023 NMFS will implement a reactive AM that accounts for payback of the 17,918 pound LAGC overage from FY2021. As a result, under No Action, the NGOM set-aside would be set at 448,062 pounds. There would be no NGOM Set-Aside specified for FY2024, and as such, the area would close to directed scallop fishing. In recent years the NGOM set-aside has been fully harvested early in the fishing year, and it is expected that it will be fully harvested in 2023 as well. Relative to FY2022, Alternative 1 (No Action) represents a reduction in the overall NGOM Set-Aside. While this is expected to equate to a similar rate of harvest from the LAGC component as seen in recent years, relative to FY 2022,the overall duration of the LAGC NGOM fishery is expected to be abbreviated (i.e., FY 2022, NGOM fishery concluded in late May 2022). In other words, under Alterative 1 (No Action), the NGOM Set-Aside would likely be harvested by early to mid-May, assuming that activity in terms of active vessels and catch rates are similar to what was observed in FY2022. If the number of active vessels and(or) catch rates in the NGOM were to be reduced in FY2023 compared to FY2022, there is potential that scallop fishing activity at some level could persist within the NGOM management area beyond the month of May; however, this is not expected given recent trends in the fishery (see Section 5.6.2) and therefore, will not be the focus of the following assessment.

As discussed in Section 5.4.2, sea turtles (hard-shelled and leatherback) are at risk of interacting with scallop dredge and trawl gear. In general, from late April/early May to November each year, sea turtles occur throughout the range of the scallop fishery. 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 (Epperly et al. 1995b; Griffin et al. 2013; Hawkes et al. 2011; NMFS 2021; Shoop & Kenney 1992). Leatherback sea turtles also occur in the Gulf of

Maine over a similar time frame as hard-shelled sea turtles, with most leaving the Northwest Atlantic shelves by mid-November . Although sea turtles can be found seasonally throughout the range of the scallop fishery, relative to Mid-Atlantic, encounter rates of hard-shelled species of sea turtles are lower in the Gulf of Maine (Murray 2018, 2020). In addition, review of NMFS observer data (NEFSC FMRD database; unpublished data) show that there have been no observed or documented interactions between scallop fishing gear and any hard-shelled species of sea turtle in the GOM (NEFSC FMRD database; unpublished data; Murray 2011; 2013; 2015a; c; Murray & Orphanides 2013a; NMFS 2012; Warden 2011a; c). Although there is the possibility for leatherback sea turtles to interact with scallop fishing gear, based on NMFS observer data (NEFSC FMRD database; unpublished data), 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 or documented, and therefore, while the risk of interaction exists, it is likely very low.

Taking into consideration the information above, since the NGOM fishery is expected to end by early to mid-May, fishing activity is not expected to have a substantial overlap with the seasonal distribution of sea turtles in the Gulf of Maine (GOM). Based on this, interactions with sea turtles are not expected.

Atlantic sturgeon are known to occur in the Gulf of Maine year-round and are vulnerable to interactions with scallop fishing gear; however, based on the best available information, the risk is expected to be low (NMFS 2021). Specifically, review of NMFS observer data from 1989 through 2019 show no observed or documented Atlantic sturgeon interactions with scallop bottom trawl gear where the haul target or trip target is scallop; and only one (1) Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NEFSC FMRD database; unpublished data). Based on this information, as well as the information provided in the sea turtle assessment above regarding fishing effort, 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 this information, as well as the information provided above in regard to expected fishing behavior and effort in the NGOM, the impacts to Atlantic sturgeon could be slightly negative overall.

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. For FY2023, the NGOM Set-Aside under Alternative 1 is higher than Alternative 2's NGOM Set-Aside Options 1, 2 and 3, and slightly lower than Alternative 2's NGOM Set-Aside Option 4. Given the lower (Options 1 to 3) and slightly higher (Options 4) catch limits being considered under Alternative 2, it is anticipated that the NGOM season will likely conclude in a similar time frame as what was experienced in FY2016-FY2022 (i.e., NGOM closure by the end of April to late-May), and therefore, relative to Alternative 2, the impacts of Alternative 1 are expected to be negligible.

6.4.2.2 Alternative 2 - Set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery (*Alternative 2 Option 3 is Preferred*)

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY 2023 and FY 2024 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Option 1 (F=0.15) and Option 2 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank only. Option 3 (F=0.15) and Option 4 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge. The resulting TALs from these options are 357,149 pounds (Option 1), 421,083 pounds (Option 2, preferred), 434,311 pounds (Option 3), and 511,472 pounds, respectively. All four 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 negligible to slight negative for all Options. Support for this determination is provided below.

The options of Alternative 2 represent lower catch limits than those authorized in FY2022 and similar limits compared to FY2018-FY2021. The NGOM fishery is not expected to extend longer than what has typically been observed (i.e., NGOM fishery concluding between late April and mid-May) as a result of the NGOM TAL options being considered under Alternative 2. The main variable driving the duration of the fishing season is the level of participation (i.e., number of active vessels). Participation could vary under either Alternative 1 or Alternative 2 because any vessels with an LAGC A (IFQ) or LAGC B/C permit could choose to fish in the NGOM. For the purposes of understanding the relationship between the level of participation in the NGOM and potential impacts to protected species, several scenarios are presented below.

In a scenario where participation remains the same as last year, with approximately 100 LAGC vessels actively fishing in the NGOM, scallop fishing activity in the NGOM would likely conclude by early to mid-May under any of the options of Alternative 2. In another scenario with a moderate decrease in active vessels in the NGOM, fishing activity in the NGOM could extend slightly compared to FY2022; however, it is difficult to say to what degree. Another scenario could be that there is a significant increase in the number of active vessels fishing the NGOM Set-Aside; under this scenario, there would be an increase of gear in the water, but the duration of the NGOM fishery would be abbreviated to a short window in the early spring (i.e., likely mid- to late-April). Given the reduction in the NGOM TAL between FY2022 and the options considered for FY2023 under Alternative 2, there would not be a strong incentive for a significant increase in the number of active vessels under any of the options of Alternative 2. 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 in the above scenarios associated with Alternative 2. While it is difficult to state which of these scenarios would occur, given recent trends in the NGOM scallop fishery, a similar level of participation as observed in FY2022 is probably the most realistic scenario to occur under Alternative 2, and as such, will be the focus of the following assessment.

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 is not expected to increase or differ from what was observed in FY2022, meaning risk of interaction with protected species is not expected to be elevated compared to current conditions as a result of Alternative 2 and its options. It is also 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 have never been observed or documented (NEFSC FMRD database; unpublished data; 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 (NEFSC FMRD database; unpublished data), 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/documented. Therefore, while the risk of interaction exists, it is likely very low, even at the levels of effort expected under Alternative 2. Taking all of these factors into consideration and acknowledging that the level of effort, fishing behavior, and duration of the NGOM fishery under the options of Alternative 2 are expected to be similar to what occurred in FY2022, the impacts to sea turtles would likely be slightly negative overall.

The impact of Alternative 2 to Atlantic sturgeon would likely be driven by the overall effort, amount of gear, and tow time in the NGOM. As provided above, Atlantic sturgeon are known to occur in the Gulf of Maine year-round and are vulnerable to interactions with scallop fishing gear; however, a review of NMFS observer data from 1989 through 2019 show no observed or documented Atlantic sturgeon interactions with scallop bottom trawl gear where the haul target or trip target is scallop, and only one (1) Atlantic sturgeon interaction with

scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NEFSC FMRD database; unpublished data)). Based on this information, as well as the information provided above regarding the most likely scenario for Alternative 2 related to the timing and amount of fishing effort in the NGOM, the impacts to Atlantic sturgeon could be slightly negative overall.

Given the similarities in NGOM TAL options under Alternative 2 and Alternative 1, the impacts to protected species are expected to be similar under both alternatives, meaning the impacts of Alternative 2 would likely be negligible relative to Alternative 1.

6.4.3 Action 3 – Fishery Specifications and Rotational Management (*Alternative 3 Option 2 is Preferred*)

Alternatives under this action set FY2023 open area and access trip allocations for the fishery. Default specifications for FY2024 are also established. The Council is considering a total of six allocation options in addition to Alternative 1/No Action. The action alternatives (Alternatives 2 - 4) offer three access area allocation options, each with two options for open area F values (Table 66). The access area options include two 10,000-pound trips to Area II (Alternative 2), two 12,000-pound trips to Area II (Alternative 3), and two 14,000-pound trips to Area II (Alternative 4). 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 FY2022 specifications for 2023 (i.e., considering changes in biomass that have occurred). The rotational access areas open under status quo differ from the action alternatives.

Table 66 shows landings, LPUE, and area swept by alternative, Table 67 provides a matrix of comparisons for the area swept values only, and Table 68 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 67). 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 available exploitable biomass accounted for in the current OFL and ABC estimates on Georges Bank. Area II is the only candidate access area being considered for FY2023. The projection model also suggests that the majority of open area fishing will occur on Georges Bank, which is consistent with observed trends in the past few years as well as survey estimates that show open areas of Georges Bank to hold greater biomass than in the Mid-Atlantic Bight region. The scallop fishery is expected to operate mostly on eastern Georges Bank in FY2023.

All action alternatives expand the boundary of Area II to include the Southwest/Extension (i.e., the FY2022 configuration), and East (i.e., closed in 2021-2022) portions of the area (Map 4Map 4). All action alternatives continue closures of the New York Bight and Nantucket Lightship West, and also establish new closures of the Elephant Trunk and Area I to protect incoming recruitment that was observed in these areas during the 2022 surveys. Each alternative has options to allocate either 22 DAS (F=0.46) or 24 DAS (F=0.51). 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 alternatives, with effects scaling according to the magnitude of effort in each area.

Table 66 – 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 36.

Alternative	Description	Projected Landings (lbs)	LPUE Estimate	Area Swept (nm^2)	Landings (mt)/Area Swept (nm^2)
4.3.1	No Action	20,214,185	2,248	2,440	3.8
4.3.2.1	Two trips at 10k each, 22 DAS	22,619,428	2,138	3,268	3.1
4.3.2.2	Two trips at 10k each, 24 DAS	23,719,535	2,100	3,612	3.0
4.3.3.1	Two trips at 12k each, 22 DAS	23,909,132	2,172	3,323	3.3
4.3.3.2 (*Pref.*)	Two trips at 12k each, 24 DAS	25,007,034	2,134	3,665	3.1
4.3.4.1	Two trips at 14k each, 22 DAS	25,207,655	2,200	3,388	3.4
4.3.4.2	Two trips at 14k each, 24 DAS	26,305,557	2,161	3,729	3.2
4.3.5	Status Quo	28,300,741	2,164	3,720	3.5

Table 67 – Comparison of area swept (nm2) between each specification alternative in Framework 36. Shading is used to emphasize comparisons between the action Alternatives 2.1 – 4.2.

Alt			4.3.1	4.3.2.1	4.3.2.2	4.3.3.1	4.3.3.2 (*Pref.*)	4.3.4.1	4.3.4.2	4.3.5
	Description	**Area swept (nm^2)**	**2,440**	**3,268**	**3,612**	**3,323**	**3,665**	**3,388**	**3,729**	**3,720**
4.3.1	No Action	**2,440**	0	-828	-1,172	-883	-1,225	-948	-1,289	-1,280
4.3.2.1	10k 22DAS	**3,268**	828	0	-344	-55	-397	-120	-461	-452
4.3.2.2	10k 24DAS	**3,612**	1,172	344	0	289	-53	224	-117	-108
4.3.3.1	12k 22DAS	**3,323**	883	55	-289	0	-342	-65	-406	-397
4.3.3.2 (*Pref.*)	12k 24DAS	**3,665**	1,225	397	53	342	0	277	-64	-55
4.3.4.1	14k 22DAS	**3,388**	948	120	-224	65	-277	0	-341	-332
4.3.4.2	14k 24DAS	**3,729**	1,289	461	117	406	64	341	0	9
4.3.5	Status Quo	**3,720**	1,280	452	108	397	55	332	-9	0

Table 68 – Comparison of the relative difference in area swept (nm^2) between each specification alternative in Framework 36. Shading is used to emphasize comparisons between the action Alternatives 2.1 – 4.2.

Alt			4.3.1	4.3.2.1	4.3.2.2	4.3.3.1	4.3.3.2 (*Pref.*)	4.3.4.1	4.3.4.2	4.3.5
	Description	**Area swept (nm^2)**	**2,440**	**3,268**	**3,612**	**3,323**	**3,665**	**3,388**	**3,729**	**3,720**
4.3.1	No Action	**2,440**	0%	-25%	-32%	-27%	-33%	-28%	-35%	-34%
4.3.2.1	10k 22DAS	**3,268**	34%	0%	-10%	-2%	-11%	-4%	-12%	-12%
4.3.2.2	10k 24DAS	**3,612**	48%	11%	0%	9%	-1%	7%	-3%	-3%
4.3.3.1	12k 22DAS	**3,323**	36%	2%	-8%	0%	-9%	-2%	-11%	-11%
4.3.3.2 (*Pref.*)	12k 24DAS	**3,665**	50%	12%	1%	10%	0%	8%	-2%	-1%
4.3.4.1	14k 22DAS	**3,388**	39%	4%	-6%	2%	-8%	0%	-9%	-9%
4.3.4.2	14k 24DAS	**3,729**	53%	14%	3%	12%	2%	10%	0%	0%
4.3.5	Status Quo	**3,720**	52%	14%	3%	12%	2%	10%	0%	0%

6.4.3.1 Alternative 1 – No Action

Alternative 1 (No Action) is the default measure for FY2023 that was implemented through Framework 34. The default measure automatically goes into place at the start of the 2023 fishing year (April 1, 2023) if the updated specifications being proposed through this action (Framework 36) are not implemented by that date. The fishery would operate under the default measures until updated specifications are implemented through this action (Framework 36). Alternative 1 would set FT LA DAS at 18 and allocate one 15,000-pound trip to Closed Area II for full-time limited access vessels. This alternative is anticipated to result in reduced levels of landings and area swept compared to all other alternatives and Status Quo.

Alternative 1 does not introduce effort to new parts of the resource and is not expected to result in significantly greater effort compared to recent years; however, because scallop fishing at any level poses an inherent risk for interactions with ESA-listed species of sea turtles and Atlantic sturgeon, the overall impact of Alternative 1 could be slightly negative.

Alternative 1 has the lowest days-at-sea allocation, access area allocations, and estimated area swept (Table 68) compared to all the alternatives being considered in Action 3 and Status Quo. Like all alternatives being considered in Framework 36, the majority of open and access area scallop fishing is expected to occur on eastern Georges Bank because the majority of exploitable biomass is estimated to be in that part of the resource.

As provided above, 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. As provided in Section 5.4.2.1.3, 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. Encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine (GOM) and Georges Bank (GB) (see Section 5.4.2.1.2) (Murray & Orphanides 2013a). As the No Action (Alternative 1) will result in the majority of open and access area scallop fishing occurring on eastern Georges Bank, the degree of overlap between scallop fishing effort and sea turtles is likely to be reduced under Alternative 1. In addition, relative to current operating conditions in the fishery, as No Action is expected to result in less overall effort and lower realized area swept, an increase in the amount of gear fished and/or trawl/dredge tow duration is not expected under the No Action. Based on this and the information provided above, Alternative 1 is not expected to introduce new or elevated interaction risks to any ESA-listed species of sea turtles. As a result, the No Action alternative is expected to result in slight negative impacts to ESA listed species of sea turtles overall.

Atlantic sturgeon are known to occur in the Gulf of Maine year-round and are vulnerable to interactions with scallop fishing gear; however, based on the best available information, the risk is expected to be low (NMFS 2021). Specifically, review of NMFS observer data from 1989 through 2019 show no observed or documented Atlantic sturgeon interactions with scallop bottom trawl gear where the haul target or trip target is scallop, and only one (1) recorded Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NEFSC FMRD database; unpublished data). Based on this information, as well as the information provided in the sea turtle assessment above regarding fishing effort, new or elevated (e.g., more gear, longer tow times) interaction risks to Atlantic sturgeon are not expected under the No Action. Taking into consideration this information, as well as the information provided above regarding fishing effort (i.e., relatively low projected area swept) the No Action alternative is expected to result in slight negative impacts to Atlantic sturgeon overall.

Taking into consideration the above information, Alternative 1 is expected to have slight negative impacts on protected species (i.e., ESA-listed species of sea turtles and Atlantic sturgeon) overall. The impacts of Alternative 1 on protected species are expected to be slightly positive relative to Alternative 2,Alternative 3, and Alternative 4 because fewer days-at-sea and less access area effort would be allocated and because area swept is expected to be lower under Alternative 1 in comparison to all other options. Because overall effort is reduced under No Action relative to Status Quo, and considering that area swept is also expected to be lower, this

alternative is expected to have a slight positive impact on ESA-listed species of sea turtle and Atlantic sturgeon in comparison.

6.4.3.2 Alternative 2 – Two access area trips in Area II with 10,000-pound trip limit

Alternative 2 would allocate full-time limited access vessels two 10,000-pound trips to Area II and either 22 DAS (Option 1) or 24 DAS (Option 2). Alternative 2 also closes Area I, the Nantucket Lightship West, the New York Bight, and the Elephant Trunk to scallop fishing for the duration of FY2023 due to sets of juvenile scallops observed in these areas during the 2022 surveys. Area swept, overall effort, and associated impacts of Option 1 and Option 2 to protected species are very similar and are therefore analyzed collectively in the following text.

Alternative 2 does not introduce effort to new parts of the resource and is not expected to result in significantly greater effort compared to recent years. In fact, the level of effort under Alternative 2 is expected to be lower than the level of effort seen in the fishery over the past several fishing years. Relative to status quo, overall area swept will likely be lower under Alternative 2 (see Table 67 and Table 68). In addition, based on the distribution of exploitable scallop biomass (i.e., the majority of exploitable scallop biomass is on Georges Bank) and considering closures of several areas such as the NYB, ET, NLS-West, and Area I, Alternative 2 is expected to focus the majority of open area effort and all access area effort on eastern Georges Bank.

As provided above, 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. As provided in Section 5.4.2.1.3, 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. Encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine (GOM) and Georges Bank (GB) (see Section 5.4.2.1.2) (Murray & Orphanides 2013a). As Alternative 2 will result in the majority of open and access area scallop fishing occurring on eastern Georges Bank, the degree of overlap between scallop fishing effort and sea turtles is likely to be reduced under Alternative 2. In addition, relative to current operating conditions in the fishery, as Alternative 2 is expected to result in less overall effort and lower realized area swept, an increase in the amount of gear fished and/or trawl/dredge tow duration is not expected. Based on this and the information provided above, Alternative 2 is not expected to introduce new or elevated interaction risks to any ESA-listed species of sea turtles. As a result, Alternative 2 is expected to result in slight negative impacts to ESA listed species of sea turtles overall.

There is limited information on Atlantic sturgeon encounter rates throughout the scallop resource area. Review of NMFS observer data from 1989 through 2019 show no observed or documented Atlantic sturgeon interactions with scallop bottom trawl gear where the haul target or trip target is scallop, and only one (1) recorded Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NEFSC FMRD database; unpublished data). Based on this, it appears the risk of an interaction between Atlantic sturgeon and scallop dredge or trawl gear is low throughout the scallop resource area (see section 5.4.2). Taking into consideration this information, as well as the information provided above regarding fishing effort (e.g., relatively low projected area swept), Alternative 2 is not expected to introduce new or elevated (e.g., more gear, longer tow times) interaction risks to Atlantic sturgeon. Given this, Alternative 2 is expected to result in slight negative impacts to Atlantic sturgeon overall.

Projected area swept under Alternative 2 is expected to be greater than Alternative 1 (No Action) by 34-48%, depending on the open area DAS option (Table 68). Open area effort would be greater under Alternative 2 relative to No Action, by either 4 DAS (Option 1) or 8 DAS (Option 2); however, the spatial distribution of open area effort is expected to similar under both alternatives, with the majority of open area fishing on Georges Bank. A slightly greater proportion of open area effort could occur on Georges Bank under Alternative 2, which closes both the New York Bight and Elephant Trunk areas, in comparison to Alternative 1, which only maintains the

current New York Bight closure. Therefore, open area fishing that would have occurred in the Elephant Trunk would instead be displaced to other areas under Alternative 2, most likely to Georges Bank. As noted above, interactions between scallop fishing gear and Atlantic sturgeon are expected to be low throughout the scallop resource area. However, encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine and Georges Bank (see Section 5.4.2.1.2; Murray & Orphanides 2013). 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). Estimated bycatch rates in trawl and dredge gear are higher in the Mid-Atlantic than in other waters in the affected environment. Given this, displacing effort out of the Mid-Atlantic region could reduce the risk of interaction with protected species that overlap with the fishery in the Mid-Atlantic at a higher rate than on Georges Bank and the Gulf of Maine, such as ESA-listed species of hard-shelled sea turtles. Therefore, considering that the risk of interactions with protected species scales with overall effort, time with gear in the water, and area swept, the impacts of Alternative 2 are expected to result in slightly negative to slightly positive impacts to protected species relative to Alternative 1 (No Action).

Alternative 2, Alternative 3, and Alternative 4 are the same with regard to access area configurations, rotational closures (i.e., Area I, NYB, ET, and NLS-West), DAS options (i.e., 22 and 24), and the number of trips to Area II access area (i.e., two trips), with the only difference being the access area trip limit to Area II (i.e., two 10,000-pound trips under Alternative 2, two 12,000-pound trips under Alternative 3, and two 14,000-pound trips under Alternative 4). The spatial distribution of open area effort is expected to be the same for all alternatives, with the majority of effort anticipated to occur on Georges Bank. Area swept is estimated to be slightly lower under Alternative 2 in comparison to Alternative 3 and Alternative 4, though the area swept estimates for all three alternatives are within 2-14% of each other depending on the Alternative and DAS option (Table 68), meaning the overall impact of each alternative to protected species is expected to be similar. Impacts to Atlantic sturgeon and ESA-listed species of sea turtle are expected to scale with the level of overall effort and associated area swept, meaning the impacts of Alternative 2, Alternative 3, and Alternative 4 are likely to be very similar. Therefore, given the above information, the impact of Alternative 2 to protected species is expected to be negligible in comparison to Alternative 3 and Alternative 4.

6.4.3.3 Alternative 3 – Two access area trips in Area II with 12,000-pound trip limit (*Preferred*)

Alternative 3 would allocate full-time limited access vessels two 10,000-pound trips to Area II and either 22 DAS (Option 1) or 24 DAS (Option 2). Alternative 3 also closes Area I, the Nantucket Lightship West, the New York Bight, and the Elephant Trunk to scallop fishing for the duration of FY2023 due to sets of juvenile scallops observed in these areas during the 2022 surveys. The Council selected Alternative 3 Option 2 (24 DAS) as the preferred alternative for Action 3. Area swept, overall effort, and associated impacts of Option 1 and Option 2 to protected species are very similar and are therefore analyzed collectively in the following text.

Alternative 3 does not introduce effort to new parts of the resource and is not expected to result in significantly greater effort compared to recent years. In fact, the level of effort under Alternative 3 is expected to be lower than the level of effort seen in the fishery over the past several fishing years, meaning Alternative 3 is not expected to result in new or elevated interaction risks to protected species. Relative to status quo, overall area swept will be lower under Alternative 3 (see Table 67 and Table 68). In addition, based on the distribution of exploitable scallop biomass (i.e., the majority of exploitable scallop biomass is on Georges Bank) and considering closures of several areas such as the NYB, ET, NLS-West, and Area I, Alternative 3 is expected to focus the majority of open area effort and all access area effort on Georges Bank.

As provided above, 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. As provided in Section 5.4.2.1.3, 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. Encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine (GOM) and Georges Bank (GB) (see Section 5.4.2.1.2) (Murray & Orphanides 2013a). As Alternative 3 will result in the majority of open and access area scallop fishing occurring on eastern Georges Bank, the degree of overlap between scallop fishing effort and sea turtles is likely to be reduced under Alternative 3. In addition, relative to current operating conditions in the fishery, as Alternative 3 is expected to result in less overall effort and lower realized area swept, an increase in the amount of gear fished and/or trawl/dredge tow duration is not expected. Based on this and the information provided above, Alternative 3 is not expected to introduce new or elevated interaction risks to any ESA-listed species of sea turtles. As a result, Alternative 3 is expected to result in slight negative impacts to ESA listed species of sea turtles overall.

There is limited information on Atlantic sturgeon encounter rates throughout the scallop resource area. Review of NMFS observer data from 1989 through 2019 show no observed or documented Atlantic sturgeon interactions with scallop bottom trawl gear where the haul target or trip target is scallop, and only one (1) recorded Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NEFSC FMRD database; unpublished data). Based on this, it appears the risk of an interaction between Atlantic sturgeon and scallop dredge or trawl gear is low throughout the scallop resource area (see section 5.4.2). Taking into consideration this information, as well as the information provided above regarding fishing effort (e.g., relatively low projected area swept), Alternative 3 is not expected to introduce new or elevated (e.g., more gear, longer tow times) interaction risks to Atlantic sturgeon. Given this, Alternative 3 is expected to result in slight negative impacts to Atlantic sturgeon overall.

Projected area swept under Alternative 3 is expected to be greater than Alternative 1 (No Action) by 36-50%, depending on the open area DAS option (Table 68). Open area effort would be greater under Alternative 3 relative to No Action, by either 4 DAS (Option 1) or 8 DAS (Option 2); however, the spatial distribution of open area effort is expected to similar under both alternatives, with the majority of open area fishing on Georges Bank. A slightly greater proportion of open area effort could occur on Georges Bank under Alternative 3, which closes both the New York Bight and Elephant Trunk areas, in comparison to Alternative 1, which only maintains the current New York Bight closure. Therefore, open area fishing that would have occurred in the Elephant Trunk would instead be displaced to other areas under Alternative 3, most likely to Georges Bank. As noted above, interactions between scallop fishing gear and Atlantic sturgeon are expected to be low throughout the scallop resource area. However, encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine and Georges Bank (see Section 5.4.2.1.2; Murray & Orphanides 2013). 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). Estimated bycatch rates in trawl and dredge gear are higher in the Mid-Atlantic than in other waters in the affected environment. Given this, displacing effort out of the Mid-Atlantic region could reduce the risk of interaction with protected species that overlap with the fishery in the Mid-Atlantic at a higher rate than on Georges Bank and the Gulf of Maine, such as ESA-listed species of hard-shelled sea turtles. Therefore, considering that the risk of interactions with protected species scales with overall effort, time with gear in the water, and area swept, the impacts of Alternative 3 are expected to result in slightly negative to slightly positive impacts to protected species relative to Alternative 1 (No Action).

Alternative 3, Alternative 2, and Alternative 4 are the same with regard to access area configurations, rotational closures (i.e., Area I, NYB, ET, and NLS-West), DAS options (i.e., 22 and 24), and the number of trips to Area II access area (i.e., two trips), with the only difference being the access area trip limit to Area II (i.e., two 10,000-pound trips under Alternative 2, two 12,000-pound trips under Alternative 3, and two 14,000-pound trips under Alternative 4). The spatial distribution of open area effort is expected to be the same for all alternatives, with the majority of effort anticipated to occur on Georges Bank. Area swept is estimated to be slightly lower under Alternative 3 in comparison to Alternative 4 and slightly higher than Alternative 2, though the area swept estimates for all three alternatives are within 2-14% of each other depending on the Alternative and DAS option (Table 68), meaning the overall impact of each alternative to protected species is expected to be similar. Impacts

to Atlantic sturgeon and ESA-listed species of sea turtle are expected to scale with the level of overall effort and associated area swept, meaning the impacts of Alternative 3, Alternative 2, and Alternative 4 are likely to be very similar. Therefore, given the above information, the impact of Alternative 3 to protected species is expected to be negligible in comparison to Alternative 3 and Alternative 4.

6.4.3.4 Alternative 4 – Two access area trips in Area II with 14,000-pound trip limit

Alternative 4 would allocate full-time limited access vessels two 14,000-pound trips to Area II and either 22 DAS (Option 1) or 24 DAS (Option 2). Alternative 4 also closes Area I, the Nantucket Lightship West, the New York Bight, and the Elephant Trunk to scallop fishing for the duration of FY2023 due to sets of juvenile scallops observed in these areas during the 2022 surveys. Area swept, overall effort, and associated impacts of Option 1 and Option 2 to protected species are very similar and are therefore analyzed collectively in the following text.

Alternative 4 does not introduce effort to new parts of the resource and is not expected to result in significantly greater effort compared to recent years. In fact, the level of effort under Alternative 4 is expected to be lower than the level of effort seen in the fishery over the past several fishing years, meaning Alternative 4 is not expected to result in new or elevated interaction risks to protected species. Relative to status quo, overall area swept is expected to be slightly lower or slightly higher (with the relative difference=0%) under Alternative 4, depending on the DAS option (see Table 67 and Table 68). In addition, based on the distribution of exploitable scallop biomass (i.e., the majority of exploitable scallop biomass is on Georges Bank) and considering closures of several areas such as the NYB, ET, NLS-West, and Area I, Alternative 4 is expected to focus the majority of open area effort and all access area effort on eastern Georges Bank.

As provided above, 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. As provided in Section 5.4.2.1.3, 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. Encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine (GOM) and Georges Bank (GB) (see Section 5.4.2.1.2) (Murray & Orphanides 2013a). As Alternative 4 will result in the majority of open and access area scallop fishing occurring on eastern Georges Bank, the degree of overlap between scallop fishing effort and sea turtles is likely to be reduced under Alternative 4. In addition, relative to current operating conditions in the fishery, as Alternative 4 is expected to result in less overall effort and lower realized area swept, an increase in the amount of gear fished and/or trawl/dredge tow duration is not expected. Based on this and the information provided above, Alternative 4 is not expected to introduce new or elevated interaction risks to any ESA-listed species of sea turtles. As a result, Alternative 4 is expected to result in slight negative impacts to ESA listed species of sea turtles overall.

There is limited information on Atlantic sturgeon encounter rates throughout the scallop resource area. Review of NMFS observer data from 1989 through 2019 show no observed or documented Atlantic sturgeon interactions with scallop bottom trawl gear where the haul target or trip target is scallop, and only one (1) recorded Atlantic sturgeon interaction with scallop dredge gear targeting Atlantic sea scallops; this sturgeon was released alive (NEFSC FMRD database; unpublished data). Based on this, it appears the risk of an interaction between Atlantic sturgeon and scallop dredge or trawl gear is low throughout the scallop resource area (see section 5.4.2). Taking into consideration this information, as well as the information provided above regarding fishing effort (e.g., relatively low projected area swept), Alternative 4 is not expected to introduce new or elevated (e.g., more gear, longer tow times) interaction risks to Atlantic sturgeon. Given this, Alternative 4 is expected to result in slight negative impacts to Atlantic sturgeon overall.

Projected area swept under Alternative 4 is expected to be greater than Alternative 1 (No Action) by 39-53%, depending on the open area DAS option (Table 68). Open area effort would be greater under Alternative 4 relative to No Action, by either 4 DAS (Option 1) or 8 DAS (Option 2); however, the spatial distribution of open

area effort is expected to similar under both alternatives, with the majority of open area fishing on Georges Bank. A slightly greater proportion of open area effort could occur on Georges Bank under Alternative 4, which closes both the New York Bight and Elephant Trunk areas, in comparison to Alternative 1, which only maintains the current New York Bight closure. Therefore, open area fishing that would have occurred in the Elephant Trunk would instead be displaced to other areas under Alternative 4, most likely to Georges Bank. As noted above, interactions between scallop fishing gear and Atlantic sturgeon are expected to be low throughout the scallop resource area. However, encounter rates of hard-shelled species of sea turtles are higher in the Mid-Atlantic relative to the Gulf of Maine and Georges Bank (see Section 5.4.2.1.2; Murray & Orphanides 2013). 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). Estimated bycatch rates in trawl and dredge gear are higher in the Mid-Atlantic than in other waters in the affected environment. Given this, displacing effort out of the Mid-Atlantic region could reduce the risk of interaction with protected species that overlap with the fishery in the Mid-Atlantic at a higher rate than on Georges Bank and the Gulf of Maine, such as ESA-listed species of hard-shelled sea turtles. Therefore, considering that the risk of interactions with protected species scales with overall effort, time with gear in the water, and area swept, the impacts of Alternative 4 are expected to result in slightly negative to slightly positive impacts to protected species relative to Alternative 1 (No Action).

Alternative 4, Alternative 2, and Alternative 3 are the same with regard to access area configurations, rotational closures (i.e., Area I, NYB, ET, and NLS-West), DAS options (i.e., 22 and 24), and the number of trips to Area II access area (i.e., two trips), with the only difference being the access area trip limit to Area II (i.e., two 10,000-pound trips under Alternative 2, two 12,000-pound trips under Alternative 3, and two 14,000-pound trips under Alternative 4). The spatial distribution of open area effort is expected to be the same for all alternatives, with the majority of effort anticipated to occur on Georges Bank. Area swept is estimated to be slightly higher under Alternative 4 in comparison to Alternative 2 and Alternative 3, though the area swept estimates for all three alternatives are within 2-14% of each other depending on the Alternative and DAS option (Table 68), meaning the overall impact of each alternative to protected species is expected to be similar. Impacts to Atlantic sturgeon and ESA-listed species of sea turtle are expected to scale with the level of overall effort and associated area swept, meaning the impacts of Alternative 4, Alternative 2, and Alternative 3 are likely to be very similar. Therefore, given the above information, the impact of Alternative 4 to protected species is expected to be negligible in comparison to Alternative 2 and Alternative 3.

6.4.4 Access Area Allocations to the LAGC IFQ Component (*Alternative 2 is Preferred*)

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.

This action is considering how LAGC IFQ access area trips will be distributed. Under Alternative 1 (No Action) the LAGC IFQ component would be allocated 357 trips to Area I, which is the default number of trips allocated through Framework 34. Note that all action alternatives in Action 3 (Section 4.3) close Area I to scallop fishing, meaning even if this alternative was selected and trips were allocated to Area I, LAGC IFQ vessels would not be able to fish them; instead, they would have to fish in other open bottom areas of the scallop resource. Under Alternative 2, a range of access area trips could be allocated to the LAGC IFQ component depending on the specifications option selected in Action 3 (Section 4.3). Under Alternative 2, a total of 476, 571, or 666 access area trips could be allocated to the LAGC IFQ component in FY2023, corresponding to Alternative 4.3.2, Alternative 4.3.3, and Alternative 4.3.4, respectively (Table 10). Alternative 2 would allocate a total number of trips that could be fished in either the Nantucket Lightship North and(or) Area II (eastern Georges Bank). Once

the total number of trips is taken, LAGC IFQ vessels will no longer be allowed to fish access area trips in either area. The LAGC IFQ component will continue to have access to the Nantucket Lightship North as part of the open bottom after the total trip allocation has been taken. Alternative 2 also reverts the Nantucket Lightship North to open bottom for the LA component after the first 90 days of FY2023.

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. Neither Alternative 1 or Alternative 2 allocate LAGC IFQ access area trips to the Mid-Atlantic region, meaning both options 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 or Alternative 2 on protected resources (i.e., with ESA-listed species of sea turtles and Atlantic sturgeon) could be slightly negative.

In a scenario where Alternative 1 is selected, it is highly unlikely that vessels would be able to fish Area I trips given that this area is closed to scallop fishing under all the action alternatives in Section 4.3. Therefore, under Alternative 1, LAGC IFQ vessels would only be able to fish quota on open trips, which would have little impact on the spatial distribution of LAGC IFQ effort and would not increase area swept beyond what is expected under status quo. Similar to current conditions, vessels homeported in the northeast would likely continue fishing on Georges Bank, and vessels homeported in the Mid-Atlantic would likely continue fishing in the Mid-Atlantic. Based on this and the information provided above, Alternative 1 is expected to result in slight negative impacts to protected resources (i.e., with ESA-listed species of sea turtles and Atlantic sturgeon).

Under Alternative 2, vessels would have the option to fish quota in the Nantucket Lightship North and Area II. Should vessels choose to fish in Area II, vessels will likely be able to harvest the possession limit in less time compared to fishing in the NLS-North and(or) open bottom because there are high densities of scallops in Area II. This could reduce bottom time, which could have a positive effect on protected species in that the risk of interaction correlates to area swept and duration of time gear is in the water. Given the choice between fishing in Area II or the Nantucket Lightship North, it is more likely that LAGC IFQ vessels will fish in the Nantucket Lightship North due to the considerably longer steam time associated with trips to Area II, even if, relative to Area II, catch rates are not as high in the Nantucket Lightship North. However, catch rates in the Nantucket Lightship North could be similar or slightly higher than what is anticipated for open trips, meaning allowing LAGC IFQ vessels to fish access area trips in the NLS-North could also have some slight benefits to protected species in that area swept and duration of time gear is in the water could be slightly reduced. Based on this and the information provided above, Alternative 2 is expected to result in slight negative impacts to protected resources (i.e., with ESA-listed species of sea turtles and Atlantic sturgeon).

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 and Alternative 2 to protected species could range from negligible to slightly positive in comparison to one another.

6.5 Impacts on Physical Environment and Essential Fish Habitat

As in previous scallop frameworks, impacts to EFH for this action are evaluated considering the amount of fishing proposed, the general location of that fishing with respect to habitat type, and the swept area expected to result from that fishing, based on estimates produced by the Scallop Area Management Simulator (SAMS) model. Since the inception of this FMP, a broad suite of measures has been employed to reduce fishing mortality and address habitat impacts. Through OHA2 (NEFMC 2016) and prior actions including Amendment 10 (NEFMC 2004), the Council has identified areas to prohibit scallop fishing in order reduce impacts on EFH. After a period of very high fishing mortality during the mid-1980's and early-1990's, rotational area management (formalized in

Amendment 10) has improved meat yields and LPUE, while DAS reductions have curbed overall fishing mortality. Overall, the successful management of the scallop resource has generally mitigated impacts on EFH.

6.5.1 Action 1 – Overfishing and Acceptable Biological Catch (*Alternative 2 is Preferred*)

The alternatives under this action pertain to setting the Annual Biological Catch (ABC) and overfishing limit (OFL) for fishing years 2023 and 2024 (default). These values are recommended by the Council's Scientific and Statistical Committee. The Alternative 2 FY 2023 and FY 2024 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 22,631 mt for FY2023 and 23,289 mt for FY2024. The OFL values are correspondingly higher. The Alternative 2 2023 ABC is about 5,000 mt lower than the default/No Action 2023 ABC (Alternative 1).

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. It should be noted that all fishing activity has negative impacts on benthic habitat, even if not directly influenced by the measures considered in Action 1. 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 (*Alternative 2 Option 3 is Preferred*)

The alternatives in this action pertain to setting the TAL for the NGOM Management Area. Under Alternative 1/No Action, the NGOM set-aside would be set at the default value for FY2023. There would be no NGOM set-aside specified for FY 2024, and the area would close to directed scallop fishing. Alternative 2 would specify catch limits for FY 2023 and FY 2024 (default), including set-asides to support research, monitoring, and a directed LAGC fishery, and accounting for 2021 overages. Alternatives and options are summarized below (also see Table 6):

- Alternative 1 (No Action): NGOM set-aside 448,062 lbs
- Alternative 2
    - Option 1 (F=0.15), based on exploitable biomass from Stellwagen Bank only. NGOM set-aside 303,693 lb
    - Option 2 (F=0.18), based on exploitable biomass from Stellwagen Bank only. NGOM set-aside 367,627 lb
    - Option 3 (F=0.15), based on exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge. NGOM set-aside 380,855 lb
    - Option 4 (F=0.18), based on exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge. NGOM set-aside 458,016 lb

In recent years the NGOM set-aside has been fully harvested early in the fishing year, and it is expected that it will be fully harvested in 2023 as well. The amount of fishing effort and impacts to EFH associated with the NGOM fishery are expected to scale up or down relative to the size of the set-aside. Alternative 2 Option 1 has the lowest set-aside and therefore will have fewer impacts to EFH as compared to Alternative 2 Options 2 and 3, which have larger but similar set-asides. Alternative 1 and Alternative 2 Option 4 have the largest set-asides and will therefore have the greatest impacts to EFH.

As was the case during the 2022 fishing year, scallop densities are highly heterogeneous within the various fishing grounds in the Gulf of Maine (Table 69). Due to much higher densities on Stellwagen Bank, most effort in the NGOM fishery is expected to occur in this area, under any of the allocations.

Table 69 – Scallop density per meter squared from the 2022 SMAST Drop camera survey for the Northern Gulf of Maine.

NGOM Region	Scallop density per m^2	Number of stations
Platts Bank	0.07	90
Ipswich Bay	0.10	93
Jeffreys Ledge	0.04	215
Stellwagen Bank NGOM	0.38	171

The 2022 SMAST drop camera estimated the highest densities of scallops on Stellwagen Bank (0.38 scallops per meter squared). The spatial distribution of scallops on Stellwagen Bank suggests that density is likely be higher on top of the bank, and that the areas that are initially fished could have even higher densities of 1-2 scallops per meter squared. Overall, these density and biomass values suggest that harvest is likely to be much more efficient on Stellwagen Bank compared to other areas like Ipswich Bay and Jeffreys Ledge. Among the Alternative 2 options, those with progressively higher TALs could be expected to result in higher area swept and greater impacts to EFH in the NGOM management area. Considering that fishing activities negatively impact habitat quality, the overall impacts of both Alternative 1 and Alternative 2 could be slightly negative; however, given these differences in efficiency, the impacts of options that establish the set-aside based on biomass in all three fishing grounds (i.e., Options 3 and 4) and have higher set aside values could be considered low negative because the TAL, expected effort, and area swept would be greater in comparison to Alternative 2 Option 1 and Option 2.

6.5.3 Action 3 – Fishery Specifications and Rotational Management (*Alternative 3 Option 2 is Preferred*)

Action 3 considers fishery specifications including rotational closures and openings for the fishery outside the NGOM. The differences between alternatives are in the number of DAS allocated and the possession limit for Closed Area II access area trips. The default specifications allocate fewer DAS and a single CAII access trip. Specifications for full time vessels are summarized below:

- Alternative 1/No Action – 18 DAS, Area II trip limit 15,000 lb., one trip
- Alternative 2 – Area II trip limit 10,000 lb., two trips
    - Option 1 – 22 DAS
    - Option 2 – 24 DAS
- Alternative 3 – Area II trip limit 12,000 lb., two trips
    - Option 1 – 22 DAS
    - Option 2 – 24 DAS
- Alternative 4 – Area II trip limit 14,000 lb., two trips
    - Option 1 – 22 DAS
    - Option 2 – 24 DAS

Given the similarities between alternatives, spatial patterns of effort and therefore of impacts to habitat are expected to be broadly similar between the different approaches, with effects scaling according to the overall magnitude of effort. Fishing effort and allocations during 2023 will influence availability of scallops during fishing year 2024, so taking a multiyear view, differences in impacts to habitat between the various approaches will likely be similar over the long term because the animals would eventually be harvested.

The tables and figures in this section are intended to support the Council's evaluation of each alternative individually and compared to each of the other allocation options. Table 66 shows projections of landings, LPUE, and area swept by alternative, based on the SAMS model, while Table 67 provides a matrix of comparisons for the area swept values only. Figure 26 compares area swept for each FW34 alternative during the 2022 fishing year relative to the projections for recent preferred alternatives. Broadly speaking, lower total area swept values represent lower effects on EFH associated with a particular alternative.

However, in terms of habitat impacts, all effort in the fishery is not considered equal, and underlying differences in habitat vulnerability affect the potential magnitude of impacts. Figure 27 depicts estimates of intrinsic habitat vulnerability to scallop dredges from the Council's Fishing Effects Model, by SAMS area. This figure shows estimated vulnerability based on evenly distributed fishing effort, with the magnitude of effort at a median level relative to historical activity. Figure 28 and Figure 29 present the results spatially for Georges Bank and the Mid-Atlantic Bight, which summarize model estimates for the 5 km by 5 km model grids overlapping various SAMS areas. For more information on the Fishing Effects Model, see NEFMC 2020 (available at https://www.nefmc.org/library/fishing-effects-model).

Habitat impacts of the fishery are of course considered in the context of catch projections. Similar levels of catch with higher area swept values present a problematic tradeoff from a habitat standpoint, relative to the same catch with lower swept area values. The status quo scenario is a good illustration of this. However, increases in swept area that are commensurate with increases in projected landings are generally viewed differently, because in these scenarios, fishery yield increases, with impacts to habitat as an associated cost. Indeed, efficiency of harvest (typically expressed in terms of LPUE) is an often-cited benefit of rotational management employed in the FMP. To attempt to quantify this tradeoff between habitat impact and yield, Figure 30 shows area swept and landings/area swept ratio, respectively, for each FW34 alternative during the 2021 fishing year relative to the projections from recent preferred alternatives. The landings/area swept ratio indicates the relative 'habitat efficiency' of fishing across the alternatives considered.

Because all the alternatives allow fishing in the same set of access areas (CAII-SW, CAII-Ext, NLS-South), and open area fishing is expected to occur in similar patterns regardless of how access areas are allocated, spatial variation in habitat vulnerability is not a particularly important consideration for this set of specifications. The substrate throughout much of southeastern Georges Bank and in the Nantucket Lightship region is predominately sandy and therefore is estimated to be less vulnerable to fishing (i.e., light blue area in Figure 28). Other locations on Georges Bank are relatively more vulnerable to median levels of dredging with scallop dredges (light red coloring in Figure 28). These include CAI Access, CAII Extension, Great South Channel, and Northern Flank, plus Closed Area II North, which is a long-term habitat closure that cannot be dredged. Areas in the Mid-Atlantic are generally lower vulnerability. CAII-Ext and the southeastern section of CAII-SE fall within the low energy portion of the model domain (light red coloring in Figure 28), which likely accounts in large part for the higher estimate of intrinsic seabed vulnerability in these locations as compared to adjacent areas of Georges Bank. The scallop resource in CAII-SW and CAII-Ext, which will be open to fishing in FY2022, is largely concentrated in the shallower and less vulnerable CAII-SW access area.

To summarize across all alternatives including No Action and status quo, the action alternatives with 22 DAS have lower swept area than those with 24 DAS, with status quo scenario having similar values to the 24 DAS alternatives (Table 66, Table 67). No Action has lower swept area estimates combined with lower projected catch, since this alternative allocates fewer DAS and between 54-75% of the CAII possession limit, depending on the action alternative to which No Action is being compared. Impacts of all action alternatives are therefore higher than Alternative 1/No Action, but similar to or reduced as compared to status quo.

Figure 26 - Comparison of Bottom Area Swept estimates (nm2) for FW36 alternatives and recent preferred alternatives.

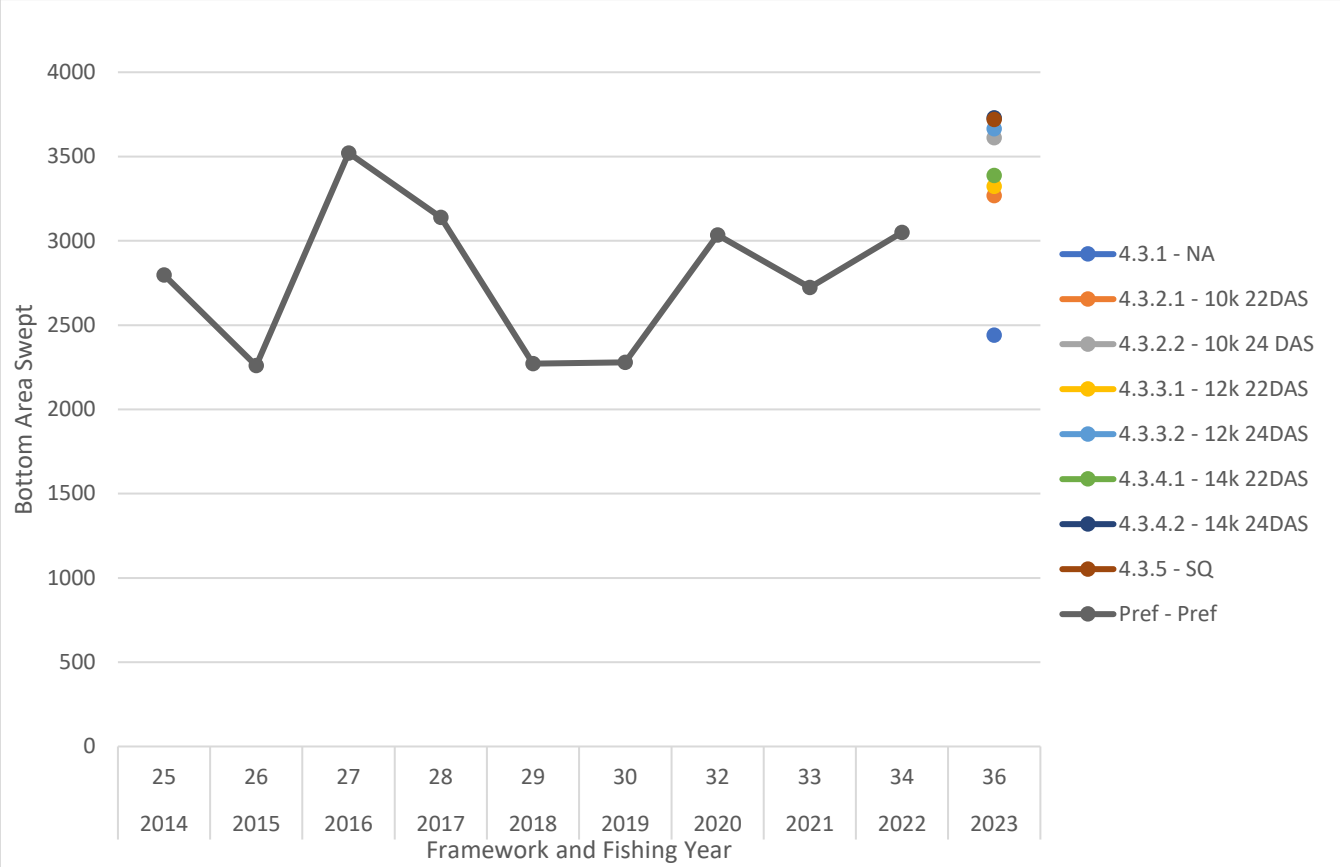


Figure 27 – Comparison of Intrinsic Habitat Vulnerability among SAMS areas

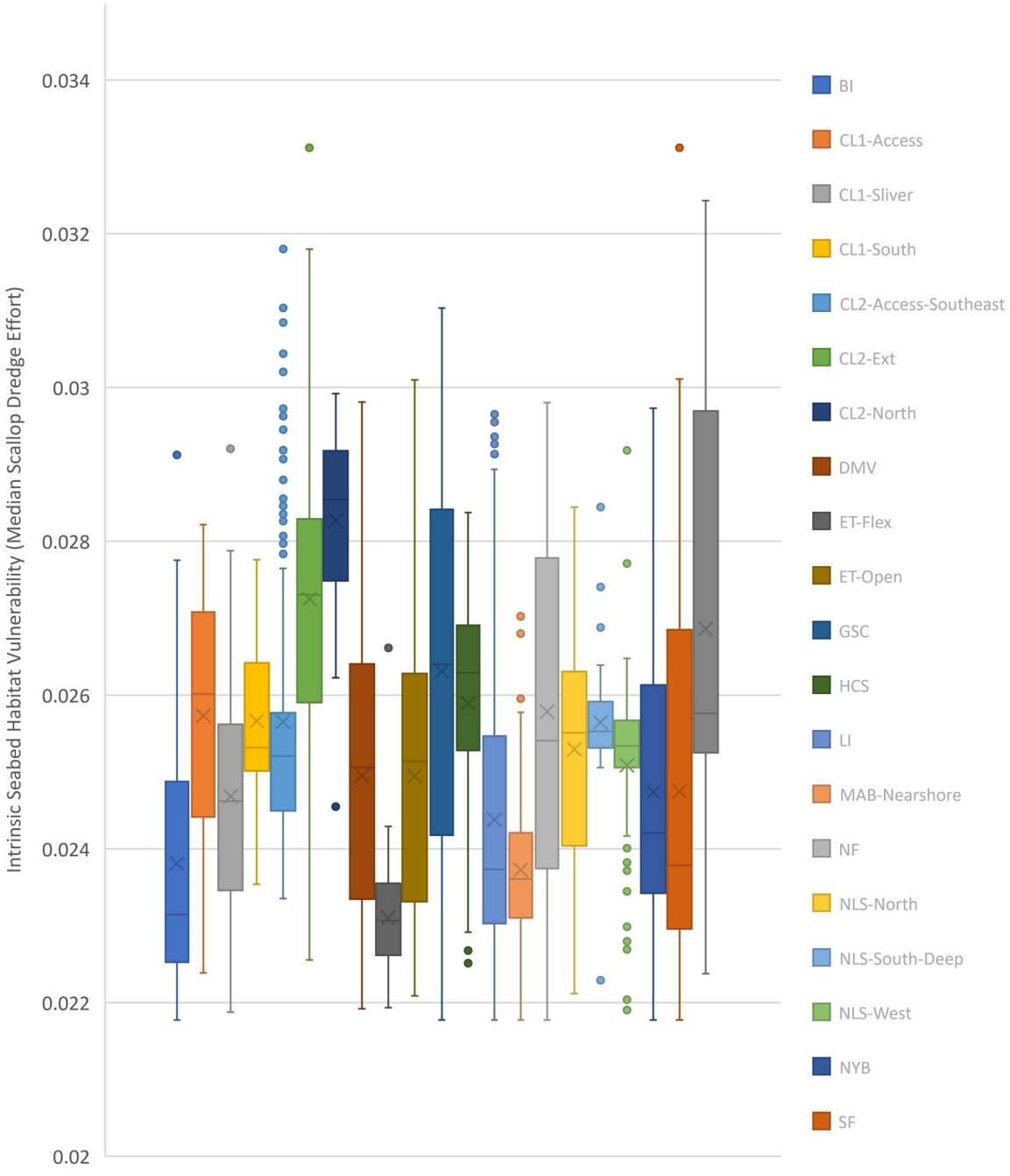


Figure 28 – Spatial distribution of intrinsic seabed habitat vulnerability on Georges Bank, based on a uniform distribution of scallop dredging at median levels. Source: Fishing Effects Model.

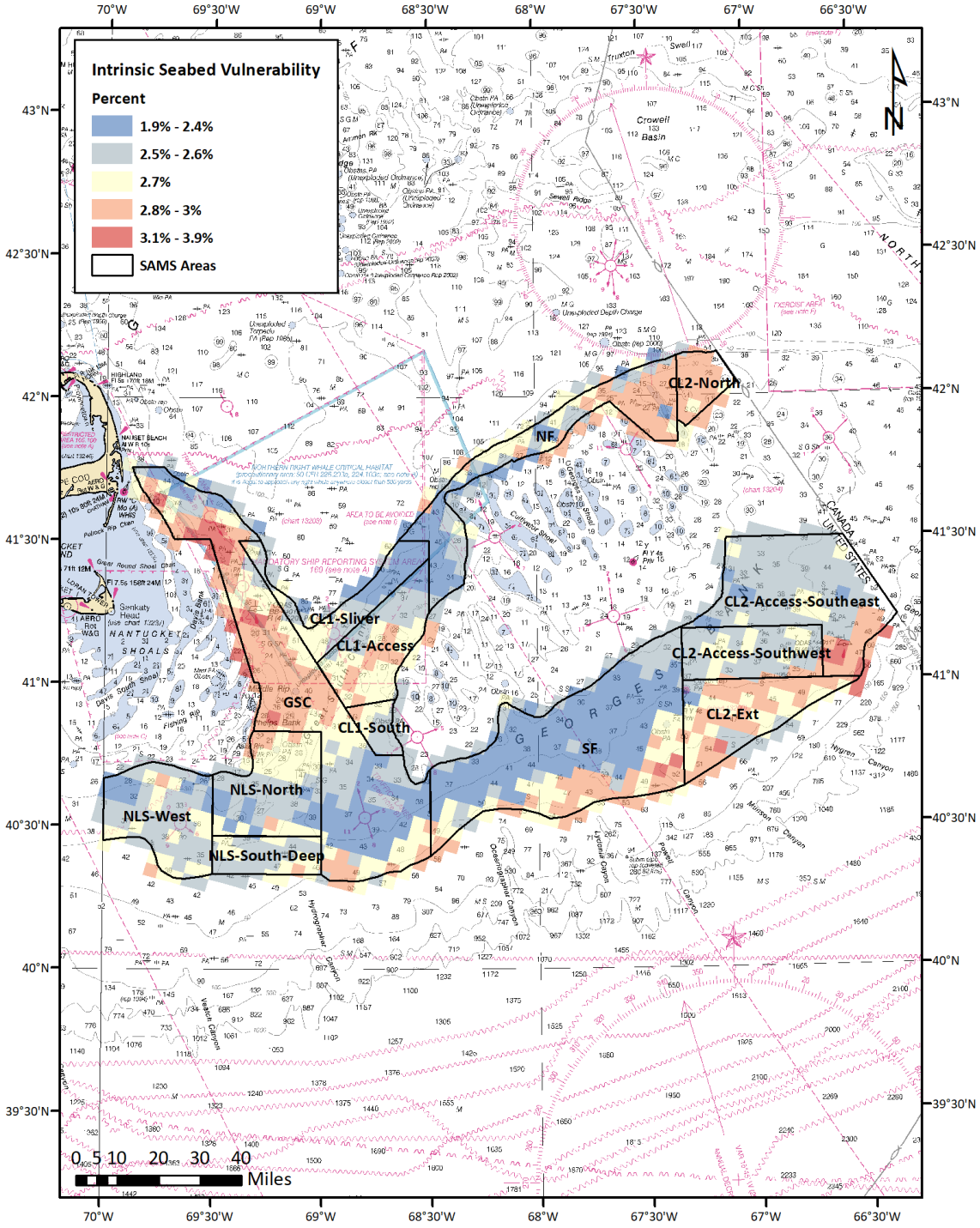


Figure 29 – Spatial distribution of intrinsic seabed habitat vulnerability in the Mid-Atlantic Bight, based on a uniform distribution of scallop dredging at median levels. Source: Fishing Effects Model.

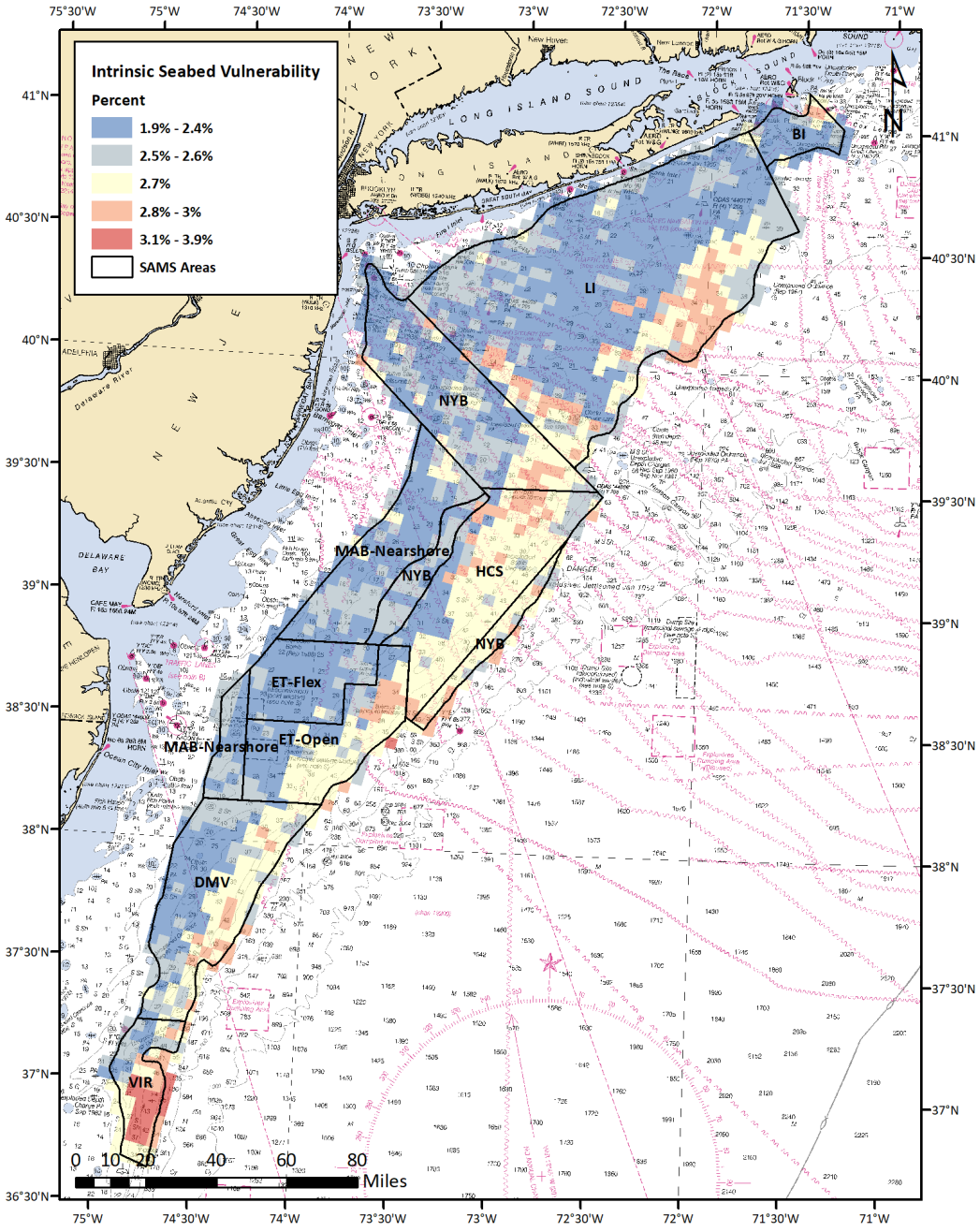
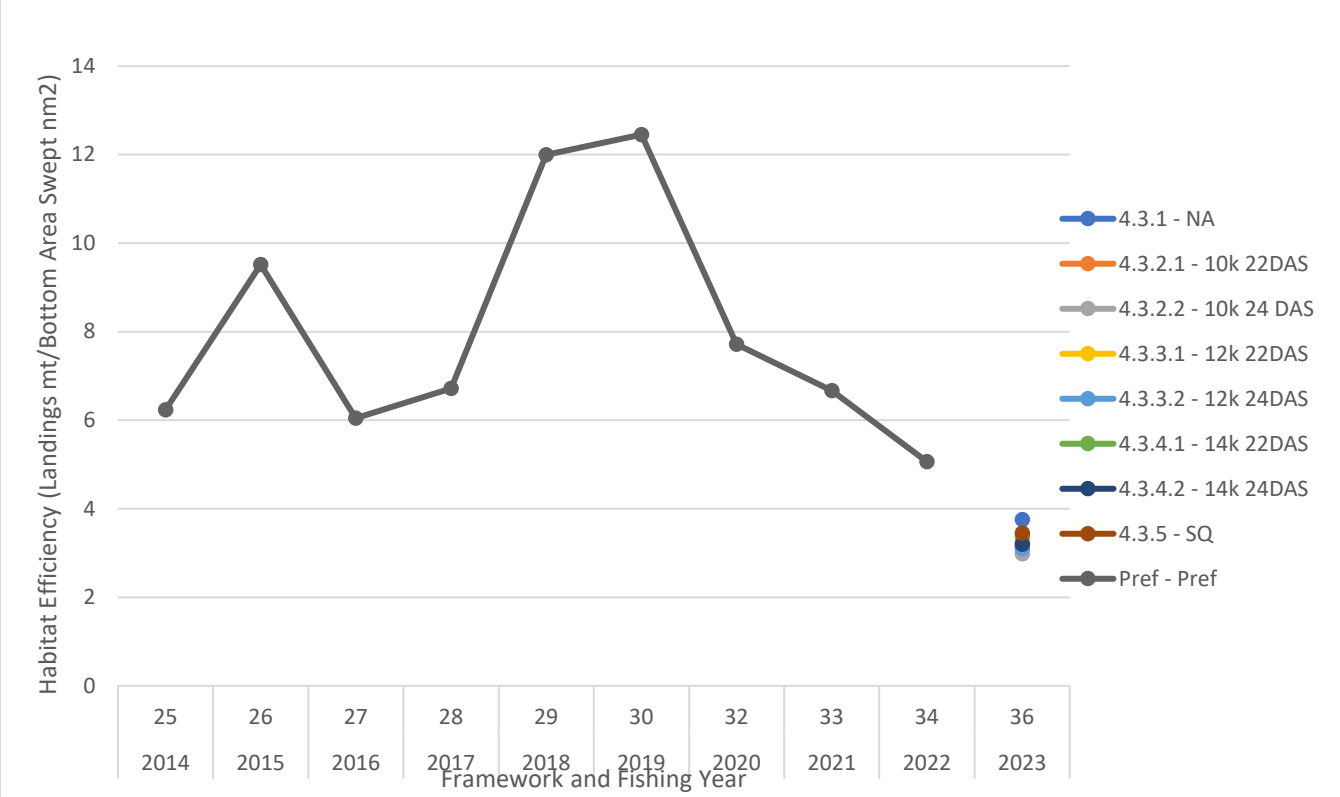


Figure 30 - Comparison of relative habitat efficiency of fishing (landings in mt divided by area swept in nm2) for FW34 specification alternatives and recent preferred alternatives. The higher the ratio, the more habitat efficient an alternative is.



6.5.4 Action 4 – Access Area Trip Allocations to the LAGC IFQ Component (*Alternative 2 is Preferred*)

The LAGC IFQ fishery is allocated 5.5% of the access area allocations as a fleet wide total number of access area trips. Under Alternative 1/No Action, no CAII trips are allocated. Access area allocations to CAII increase from Alternative 2 to Alternative 4 (See Action 3), and the fleetwide LAGC trips also increases, as shown in Table 10.

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, 3, and 4 would likely have lower impacts to EFH as compared to Alternative 1. The difference in impacts of Alternative 2 versus Alternative 3 versus Alternative 4 on EFH is likely to be negligible.

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 5.6.3. This includes 11 primary ports (e.g., New Bedford, Cape May, Hampton/Seaford) and 12 secondary ports for the scallop fishery (Table 55). 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

The following sections analyze the economic impacts of the management alternatives considered in Framework 36. The objective of the cost-benefit analysis is to evaluate the net economic benefits arising from changes in consumer and producer benefits that are expected to occur with implementation of a regulatory action. As the

NMFS Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007) [12] state "the proper comparison is '*with the action' to 'without the action'* rather than to *'before and after the action,*' since certain changes may occur even without action and should not be attributed to the regulation." The guidelines also state that the "No Action alternative does not necessarily mean a continuation of the present situation, but instead is the most likely scenario for the future, in the absence of other alternative actions"[13]. Even without action, the scallop stock abundance in open and access areas will be different, and as a result, landings, scallop prices, fishing costs, revenues and benefits from the fishery would change compared to the present levels. For Action 3 (specifications), analyses consider two baselines, No Action and Status Quo.

While NMFS 2007 guidelines indicate "The No Action alternative should be the basis of comparison for other alternatives", it very often uses the terms "No Action" and "Status Quo" interchangeably[14]. The economic analyses presented in this section make a distinction in the definition of those terms. In this analysis "No Action" refers to a "regulatory" baseline and "Status Quo" refers to a state with no changes from the present allocations for open area DAS and access area trips. The definition of "No Action" refers to the default measures that are specified in Framework 33 until the next Framework action is implemented.

However, the default "No Action" measures are temporary in nature and allocations set under those measures are usually considerably lower than the allocations either in the current fishing year (in 2023) or the projected allocations in the next fishing year (2024). This is done to allow for limited levels of harvest to continue if there are delays in the implementation of the proposed measures in next Framework Action. As a result, the projections for landings, revenues and economic benefits under the No Action alternative are considerably lower than the current levels and the levels that are expected under the proposed measures. Because of this, if economic benefits of the proposed alternatives were estimated using No Action as the baseline, the impacts on the economy would be overstated in the short-term compared to the present circumstances.

For these reasons, the economic analyses in Framework 36 also includes a Status Quo scenario *(SQ)* to provide an assessment of how landings, revenues and total economic benefits from the scallop fishery would change if the current regulations were continued in 2023. From that perspective, status quo is a more realistic baseline to assess the impacts of the proposed measures on the economy.

As the Guidelines for Economic Analysis of Fishery Management Actions specify, "benefits and costs are measured from the perspective of the Nation, rather than from that of private firms or individuals. Benefits enjoyed by other nations are not included, although tax payments by foreign owners, and export revenues, are benefits to the Nation."

Because fishery management actions in general result in short-term costs for the industry in terms of foregone revenue, "choosing a period of analysis that is too short may bias the analysis toward costs, where costs are incurred in the short-term and benefits are realized later." Similarly, the Office of Management and Budget (OMB, 2003) indicated that the analyses should "present the annual time stream of benefits and costs expected to result from the rule," and state that "the beginning point for your stream of estimates should be the year in which the final rule will begin to have effects" and "the ending point should be far enough in the future to encompass all the significant benefits and costs likely to result from the rule."[15] For these reasons, guidelines indicate that "a

[12] Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions, March 2007,

http://www.nmfs.noaa.gov/sfa/domes_fish/EconomicGuidelines.pdf

[13] Ibid, p.12

[14]For example, see p. 15 of 2007 NMFS guidelines: "For economic analysis of regulatory actions, changes in net benefits are measured by the difference in the present value of the discounted stream of net benefits of regulatory action, as compared to the status quo. In this context, a positive result means that the net present value of the regulatory action exceeds that of the status quo."

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

reasonable attempt should be made to conduct the analysis over a sufficient period of time to allow a consideration of all expected effects."

Furthermore, the economic impacts of the proposed regulations over the long-term should be evaluated by the discounted cumulative present value of the stream of benefits since benefits or costs that occur sooner are generally more valuable (or have a positive time preference). Discount rate is the interest rate used in calculating the present value of expected yearly benefits and costs.

This section examines the economic impacts of the proposed regulations in Framework 36. Although Framework 36 is a one-year action, it will have impacts on the future yield from scallop resources, on scallop revenues and total economic benefits. The short- and the long-term economic impacts of the specification alternatives are analyzed in Section 6.6.1.3. The present value of long-term benefit and costs of the specification alternatives are estimated using a 7% discount rate. The higher discount rate (7%) provides a more conservative estimate and a lower bound for the economic benefits of alternatives compared with the benefits predicted using a lower discount rate (3%).

6.6.1.1 Action 1 – Overfishing and Acceptable Biological Catch

The MSA requires the SSC to set an acceptable biological catch (ABC), or maximum catch level that can be removed from the resource, taking into account all sources of biological uncertainty. The Council is prohibited from setting catch limits above that level. This requirement is expected to have long-term economic benefits on the fishery by helping to ensure that catch limits and fishing mortality targets are set at or below ABC. This should help prevent overfishing and optimize yield on a continuous basis.

6.6.1.1.1 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 2023, which were adopted by the Council through FW34 (Table 60).

The economic impacts of Alternative 1 are likely to be negligible. Since the ABC under No Action and Alternative 2 are not expected to constrain the fishery, the impacts of the No Action are likely to be negligible compared to Alternative 2. However, since Alternative 1 would not set a default OFL or ABC for FY 2023, the start of FY 2023 could be delayed (from April 1, 2023) if there is a delay in setting specifications next year. Therefore, the overall short-term impacts of Alternative 1 are likely to be negative compared to Alternative 2. In the long-term, Alternative 1 is likely to have slight negative stock benefits. If this leads to more restrictive regulations, the potential impacts of the "No Action" ABC on economic benefits are negative.

6.6.1.1.2 Updated OFL and ABC for FY 2023 and FY 2024 (*Preferred Alternative*)

The FY 2023 and FY 2024 OFL and ABC values that are preferred by the Council are summarized in Table 60. After several years of below-average recruitment in the Mid-Atlantic, the fishery is shifting primarily to Georges Bank. The fleet is expected to continue to target the small slow growing scallops in the Nantucket Lightship South. Overall, the OFL and ABC values in Alternative 2 are based on the most updated survey information and model configurations.

The economic impacts of Alternative 2 are likely negligible to slightly positive. Since the ABC under No Action and Alternative 2 are not expected to constrain the fishery, the impacts of the Alternative 2 are likely to be negligible relative to No Action. The overall short-term impacts of Alternative 2 are likely to be positive compared to No Action because Alternative 2 would set a default OFL or ABC for FY 2023. This means that the fishing year could start on time in FY2023 (from April 1, 2023). The fishing year could not begin on April 1, 2023 if no OFL or ABC is set and there is a delay in setting specifications next year. Overall, using updated OFL and ABC estimates should have positive economic impacts over the long-term because the ABC values were determined based on the recent surveys and projections. If this leads to less restrictive regulations, there may be positive long-term economic impacts.

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

6.6.1.2.1 Alternative 1 – No Action

Under Alternative 1 – No Action, the default specifications approved in Framework 34 for the NGOM Set-Aside would be in place for the 2023 fishing year. The NGOM Set-Aside would be set at 448,062 pounds, and there would be no value specified for the 2024 fishing year, and the area would close to directed scallop fishing (Table 72).

No Action (Alternative 1) will have positive economic impacts on the NGOM portion of the fishery compared to Alternative 2. For FY 2023, this alternative would result in higher revenues and net benefits relative to Alternative 2 with Options 1 to 4. For FY2024, No Action could be expected to have negative economic impacts relative to Alternative 2 because under Alternative 2 the NGOM Set-Aside would be set at zero and the area would be closed to fishing.

For FY2023, estimated scallop revenue for the LAGC NGOM fleet would be about $6.95 million under this alternative using an estimated price of $15.52 per pound and assuming landings will be equivalent to 448,062 pounds. Fishing costs are estimated to be about $2.24 million and net revenue would be about $4.71 million for the LAGC NGOM fleet[16] (Table 70).

Table 70. NGOM Set-Aside, Scallop revenue and costs under Alternative 1, No Action (Monetary values are in 2022 dollars)

Data and Values	**Estimated values for FY2022**
NGOM Set-Aside	448, 062 lbs
Economic Impacts on the LAGC (NGOM) share:	
• Estimated LAGC scallop revenue	$6,953,922
• DAS	2,240
• Trip costs ($1,000/DAS)	$2,240,310
• **Net revenue**	**$4,713,612**

6.6.1.2.2 Alternative 2 - Set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery (*Alternative 2 Option 3 is Preferred*)

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY 2023 and FY 2024 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Option 1 (F=0.15) and Option 2 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank only. Options 3 (F=0.15) and Option 4 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge.

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[16] Scallop revenue and cost estimates are based on the following assumptions and data. The assumed price per pound of scallops, $15.52, is roughly equivalent to the average estimated price (in 2022 dollars) for all market categories of scallops under the FW36 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 2021 dollars were later adjusted by cost inflation to estimate costs in terms of 2022 dollars. Note that the observed trip costs in FY2022 increased by about 35 percent compared to the trip cost estimates in FY2021. Hence estimated trip cost for a NGOM vessel is about $1000 per DAS. This cost inflation rate was taken into consideration while estimating the trip costs (in 2022 dollars) in FR36 economic analysis. Total DAS for the NGOM fleet was estimated by dividing TAC with the 200 lb. possession limit.

- NGOM Set-Aside for FY2023: The NGOM Set-Aside for FY2023 under the options of Alternative 2 ranges from 303,693 pounds (Option 1) to 458,016 pounds (Option 4) (Table 71).

- The economic impacts of the FY2023 NGOM Set-Aside in Alternative 2 (Option 1 to 4) are shown in Table 71 and the economic impacts of the associated FY2024 default NGOM Set-Aside values are shown in Table 72. The economic impacts of the Alternative 2 for all options under consideration are negative except for Option 4.

Table 71. Economic Impacts of the FY2023 NGOM TAL under Alternative 2 Option 1 - 4 (monetary values are in 2022 dollars).

	Alternative 2			
	4.2.2.1	**4.2.2.2**	**4.2.2.3**	**4.2.2.4**
	Option 1	**Option 2**	**Option 3 (*Preferred*)**	**Option 4**
	F=0.15	F=0.18	F=0.15	F=0.18
Area(s) Fished	Stellwagen	Stellwagen	Stellwagen, Ipswich, Jeffreys	Stellwagen, Ipswich, Jeffreys
2023 Total Allowable Landings	357,149	421,083	434,311	511,472
1% NGOM ABC for Observers	10,538	10,538	10,538	10,538
2023 RSA Contribution	25,000	25,000	25,000	25,000
2021 Overage Payback	17,918	17,918	17,918	17,918
2023 NGOM Set-Aside	**303,693**	**367,627**	**380,855**	**458,016**
Impacts of the NGOM Set-Aside:				
Estimated LAGC revenue	$4,713,315	$5,705,571	$5,910,870	$7,108,408
DAS	1,518	1,838	1,904	2,290
Trip costs ($1000 per DAS)	$1,518,465	$1,838,135	$1,904,275	$2,290,080
Net revenue	**$3,194,850**	**$3,867,436**	**$4,006,595**	**$4,818,328**
Net revenue net of No Action	**($1,518,762)**	**($846,176)**	**($707,018)**	**$104,716**

Table 71 and Table 72 summarize the economic impacts of Alternative 2 in FY2023 and FY2024 (default), respectively. Revenues and net revenues under FY2023 options 1-4 under Alternative 2 are all lower than estimated for Alternative 1 (No Action).

- Alternative 2, Option 1 would result in a lower NGOM Set-Aside (303,693 pounds) for the LAGC component compared to the LAGC share of the NGOM TAC under Alternative 1 (448,062 pounds) for the 2023 fishing year and is expected to have an estimated revenue of $4.71 million. Net revenue for Alternative 2 Option 1 would be around $3.2 million, which is about $1.52 million lower than No Action.
- Alternative 2 Option 2 yields lower net revenue estimated at $3.86 million in FY2023. The net benefit (net of No Action) for this sub-option is estimated to be about $0.85 million lower than Alternative 1. The net benefit in this option is higher than option 1, but lower than option 3 and option 4.

- Alternative 2 Option 3 (*Preferred*) yields lower net revenue estimated at $4 million in FY2023. The net benefit (net of No Action) for this option is estimated to be about $0.71 million lower than the Alternative 1. The preferred alternative has a negative economic impact relative to Alternative 1.

- Alternative 2 Option 4 yields higher net revenue estimated at $4.81 million in FY2023. The net benefit (net of No Action) for this option is estimated to be about $0.104 million higher than the Alternative 1.

- Comparing the four options in Alternative 2 for FY2023, Option 4 has the highest net revenues relative to other options, but all options in Alternative 2 have lower revenues relative to the No Action except Option 4.

- All options in the Alternative 2 have lower economic benefits in the short term relative to Action 1 (No Action) except Option 4. The preferred alternative has a negative economic impact relative to Alternative 1 in the short term. 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 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. The measures in Option 1-3 are expected to result in short-term negative economic benefit but positive benefit in Option 1. However, all options in Alternative 2 are expected to have positive economic benefits in the long-term to the participants of the NGOM fishery.

6.6.1.2.3 2024 NGOM TAL Options

Default Set-Aside for FY2024: The FY2024 default NGOM Set-Aside is set at 75% of the FY2023 NGOM Set-Aside. The default NGOM Set-Aside for the Alternative 2 in FY2024 would be set at 227,770 pounds under Option 1, 275,720 pounds in Option 2, 285,641 pounds in Option 3 (preferred) and 343,512 pounds in Option 4.

The economic impacts of NGOM TAL options are given in Table 67. Economic impacts for the FY2024 default measures correspond to the options in Alternative 2. Revenues range from $3.53 million in Option 1 to $5.33 million in Option 4 (highest). The preferred option 3 will have expected revenue of about $4.43 million in FY2024. The revenue in preferred option is expected to be lower than Option 4 but higher than Option 1 and Option 2.

Table 72. Economic impacts of the FY2024 (default) NGOM Set-Aside under Alternative 2 Option 1 -4 (values in 2022 dollars).

	Alternative 2			
	Option 1	**Option 2**	**Option 3 (Preferred)**	**Option 4**
2024 Default NGOM Set-Aside	227,770	275,720	285,641	343,512
Impacts of the 2024 NGOM Set-Aside (default):				
Estimated Revenue	$3,534,990	$4,279,174	$4,433,148	$5,331,306
DAS	1,139	1,379	1,428	1,718
Trip costs ($1000 per DAS)	$1,138,850	$1,378,600	$1,428,205	$1,717,560
Net revenue	**$2,396,140**	**$2,900,574**	**$3,004,943**	**$3,613,746**

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 73 provides a comparison of anticipated F rates, along with APL values for the LA and LAGC components of the scallop fishery.

Table 73 - Comparison of allocations and DAS associated with each specification alternative in FW36.

FW36 Specification Alternatives & Options	Description (Open DAS, and 2 CAII Trip limits.)	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	0.18	0.34	20,214,161	18,064,942	17,071,370	993,572
4.3.2.1	22-DAS, 10,000 lbs.	0.22	0.46	22,619,401	20,470,185	19,344,325	1,125,860
4.3.2.2	24 DAS, 10,000 lbs.	0.23	0.51	23,719,507	21,570,292	20,383,926	1,186,366
4.3.3.1	22 DAS, 12,000 lbs.	0.23	0.46	23,909,104	21,759,889	20,563,095	1,196,794
4.3.3.2 (Preferred)	24 DAS, 12,000 lbs.	0.24	0.51	25,007,005	22,857,791	21,600,612	1,257,179
4.3.4.1	22 DAS, 14,000 lbs.	0.25	0.46	25,207,625	23,058,412	21,790,199	1,268,213
4.3.4.2	24 DAS, 14,000 lbs.	0.26	0.51	26,305,526	24,156,314	22,827,717	1,328,597
4.3.5	Status Quo*	0.3	0.39	28,300,707	25,753,643	24,337,193	1,416,450

* Status Quo (SQ) refers to Framework 34 preferred measures and is provided in the alternatives section of Framework 36 to provide continuity and context for the reader but is not an option proposed for Council decision.

Alternatives considered in Framework 36 are described in Section 4.3 for a full-time limited access vessel. No Action corresponds to the default measures in Framework 34 and Status Quo refers to a state with no changes from the present allocations in Framework 34 for open area DAS, access area trips, and area closures, using updated biological data from the 2022 surveys.

Economic impacts in the Framework 36 fishery specifications are evaluated for both the short- and long-terms, i.e., the short-term impacts in FY2023 and the long-term impacts over the 15- year period from FY2023-FY2037. This analysis uses price and variable trip cost models that incorporate data through FY2021. Scallop prices and trip cost estimates are adjusted to 2022 dollars for the FY2023 (short-term) projections using economy wide inflation index, i.e., CPI. Scallop prices have experienced wide swings, with very high price increases for all market grades in FY2021 and FY2022.[17] In order to better account for the recent price increases, price models incorporated consumer demand component as well.

The long-term landings streams are based on assumptions of average recruitment and constant F over the long-term. Since the Council generally sets specifications for one or two years, the long-term estimates should be interpreted as relative comparisons between measures, and not absolute values of future landings and economic

[17] 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. The price increase has surpassed well above the economy wide inflation index during FY2021. The economy wide CPI increased by about 6 percent between FY2020 and FY2021. However, U10 grade price increased by about 124 percent and 11 to 20 grade scallop price increased by about 43 percent for the same period. Overall, there was about 54% increase in the price of all grades of scallops during FY2021.

Prices of scallops have pulled back slightly in FY2022, but they are still high relative to earlier years. In the early part of FY2022, U10 grade price decreased by about 13 percent and 11 to 20 grade scallop price decreased by about 10 percent while economy wide CPI increased by about 9 percent between FY2021 and FY2022 (Apr-Jul).

In FY2021, fuel price increased by about 33 percent and overall trip cost increased by about 32 percent. In FY2022 (Apr-Oct), fuel price has increased by about 49 percent and overall trip cost increased by about 35 percent.

impacts. The long-term economic impacts are evaluated conservatively using scallop prices adjusted with the recent CPI. Economic values are then discounted to present values at 7 and 3 percent.

Short-term Economic Impacts of the FW36 Fishery Specification Action

Below is the summary of economic impact in the short-term (FY2023) for the FW36 Fishery Specification Action. Table 74 provides a summary of the short-term impacts in terms of landings, revenues, producer surplus, consumer surplus, and total economic benefits for all alternatives and options in consideration. Each alternative including the No Action alternative is compared with the status quo.

Table 74 – Economic Impacts for FY2023: Estimated landings (Mill.lb.), revenue and economic benefits (Mill. $, in 2022 dollars), and prices (in 2022$ per lb.).*

Alternatives/Options		Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Key Economic Variables	**RUN**	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
	Units*								
Landings	Mil lbs.	20.214	22.619	23.720	23.909	25.007	25.208	26.306	28.301
Price _ALL	$/lb.	$16.31	$16.11	$16.01	$16.04	$15.94	$15.96	$15.87	$15.75
Revenue	Mil $	$329.77	$364.48	$379.83	$383.44	$398.63	$402.34	$417.38	$445.78
Revenue Difference from SQ	**Mil $**	**-$116.01**	**-$81.29**	**-$65.95**	**-$62.34**	**-$47.15**	**-$43.44**	**-$28.40**	**$0.00**
Producer Surplus**	Mil $	$245.34	$272.80	$284.87	$289.80	$301.73	$306.62	$318.39	$342.67
Consumer Surplus***	Mil $	$13.50	$16.84	$18.43	$18.75	$20.43	$20.78	$22.53	$25.73
Total Benefits (PS+CS)	Mil $	$258.84	$289.64	$303.30	$308.55	$322.15	$327.40	$340.93	$368.40
Total Benefits Difference from SQ	**Mil $**	**-$109.56**	**-$78.76**	**-$65.10**	**-$59.85**	**-$46.25**	**-$41.00**	**-$27.47**	**$0.00**
Rank of Total Benefits		**7**	**6**	**5**	**4**	**3**	2	1	

*CPI based priced adjustment to 2022 dollars for the price model estimates that are in 2021 dollars.

6.6.1.3.1 Alternative 1 – No Action

Alternative 1 or No Action alternative (Section 4.3.1) yields least economic benefits in terms of landings, revenues, and total economic benefits in the short-term compared to Alternative 2, Alternative 3 and Alternative 4 (Table 74). No Action has also lower economic benefits compared to the status quo.

The No Action alternative is expected to have total landings 20.21 million pounds, revenue $329.77 million, and producer surplus $245.34 million, consumer surplus $13.5 million and total economic benefits $258.84 million in FY2023.

6.6.1.3.2 Alternative 2 – Two access area trips in Area II with 10,000-pound trip limit

Alternative 2 has two access area trips in CAII with 10,000-pound trip limit with two options—Option 1 with 22 DAS (Section 4.3.2.1) and Option 2 with 24 DAS (Section 4.3.2.2). This alternative has higher landings, revenues, producer surplus, and consumer surplus relative to No Action but lower than Alternative 3, Alternative 4 and status quo.

Option 1 in this alternative (Section 4.3.2.1) is expected to have total landings 22.62 million pounds, revenue $364.48 million, producer surplus $272.8 million, consumer surplus $16.84 million and total economic benefits $289.64 million. It ranks sixth among the FW36 specification alternatives in consideration and has also lower benefits relative to the status quo.

Option 2 in this alternative (Section 4.3.2.2) is expected to have total landings 23.722 million pounds, revenue $379.83 million, producer surplus $284.87 million, consumer surplus $18.43 million and total economic benefits $303.3 million. It ranks fifth among the FW36 specification alternatives in consideration and has also lower benefits relative to the status quo.

6.6.1.3.3 Alternative 3 – Two access area trips in Area II with 12,000-pound trip limit (*Alternative 3 Option 2 is Preferred*)

Alternative 3 has two access area trips in CAII with 12,000-pound trip limit with two options—Option 1 with 22 DAS (Section 4.3.3.1) and Option 2 with 24 DAS (Section 4.3.3.2). This alternative has higher landings, revenues, producer surplus, and consumer surplus relative to No Action and Alternative 2 but lower than Alternative 4, and status quo.

Option 1 in this alternative (Section 4.3.3.1) is expected to have total landings of about 23.91 million pounds, revenue $383.44 million, producer surplus $289.8 million, consumer surplus $18.75 million and total economic benefits $308.55 million. It ranks fourth among the FW36 specification alternatives in consideration and has also lower benefits relative to the status quo.

Option 2 in this alternative (Section 4.3.3.2) is expected to have total landings 25 million pounds, revenue $398.63 million, producer surplus $301.73 million, consumer surplus $20.43 million and total economic benefits $322.15 million. It ranks third among the FW36 specification alternatives in consideration and has also lower benefits relative to the status quo.

6.6.1.3.4 Alternative 4 – Two access area trips in Area II with 14,000-pound trip limit

Alternative 4 has two access area trips in CAII with 14,000-pound trip limit with two options—Option 1 with 22 DAS (Section 4.3.4.1) and Option 2 with 24 DAS (Section 4.3.4.2). This alternative has higher landings, revenues, producer surplus, and consumer surplus relative to No Action, Alternative 2 and Alternative 3 but lower than and status quo.

Option 1 in this alternative (Section 4.3.4.1) is expected to have total landings of about 25.21 million pounds, revenue $402.34 million, producer surplus $306.62 million, consumer surplus $20.78 million and total economic benefits $327.40 million. It ranks second among the FW36 specification alternatives in consideration and has also lower benefits relative to the status quo.

Option 2 in this alternative (Section 4.3.4.2) is expected to have total landings about 26.31 million pounds, revenue $417.38 million, producer surplus $318.39 million, consumer surplus $22.53 million and total economic benefits $340.93 million. It ranks highest among the FW36 specification alternatives in consideration but has lower economic benefits relative to the status quo.

6.6.1.3.5 Summary of Short-Term and Long-Term Economic Impacts

Summary of the Short-term (FY2023) Economic Impacts (Table 74)[18]**:**
Short-term economic impacts in terms of landings, prices, revenues, producer surplus, consumer surplus, and total economic benefits for the FW36 specification alternatives are compared with the status quo (SQ).

- Landings, revenues, producer surplus, consumer surplus, and total economic benefits (a sum of producer and consumer surpluses) in No Action, Alternative 1 (Section 4.3.2.1 and Section 4.3.2.1), Alternative 2

[18] 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 CPI based price adjustment to 2022 dollars. All economic numbers are in 2022 dollars in the short-term economic impacts.

(Section 4.3.3.1 and 4.3.3.2), and Alternative 3 (Section 4.3.4.1 and Section 4.3.4.2) with 10,000 lbs., 12,000 lbs., and 14,000 lbs. with 22- and 24-DAS options are all lower than status quo in the short-term.

- Higher economic benefits correspond to higher trip limit and higher DAS in the short-term.

- The No Action (Section 4.3.1) has the least landings, revenues, and total benefits in the short-term, but this alternative is only a transitory measure until the preferred alternative in the FW36 specification action is implemented.

- Revenue ranges from around $364.48 million for Alternative 2 Option 1 (Section 4.3.2.1) to $417.38 million for Alternative 4 Option 2 (Section 4.3.4.2).

- Producer surplus ranges from around $272.80 million for Alternative 2 Option 1 (Section 4.3.2.1) to $318.39 million for Alternative 4 Option 2 (Section 4.3.4.2).

- Consumer surplus ranges from around $16.84 million for Alternative 2 Option 1 (Section 4.3.2.1) to $22.53 million for Alternative 4 Option 2 (Section 4.3.4.2).

- Total economic benefit (in 2022 dollars) for the highest ranked Alternative 4 Option 2 (Section 4.3.4.2) is about $340.93 million but $289.64 million for the lowest ranked Alternative 2 Option 1 (Section 4.3.2.1).

- Compared to the status quo, total economic benefits are lower by about $27.47 million for the highest ranked Alternative 4 Option 2 (Section 4.3.4.2) but is lower by $78.76 million for the lowest ranked Alternative 2 Option 1 (Section 4.3.2.1).

- The short-run (FY2023) economic impacts for the Council Preferred Alternative (Section 4.3.3.2) are evaluated.
    - The preferred alternative has annual projected landings of 25.007 million pounds with expected revenue of $398.63 million; producer surplus $301.73 million; and total economic benefits $322.15 million.
    - The preferred alternative's economic benefits (i.e., revenues, producer surplus, and total economic benefits) are higher than No Action (4.3.1), Alternative 2 and Alternative 3 (Option 1) but lower than Alternative 4.
    - The economic benefits for the preferred alternative are also slightly lower than status quo scenario (Section 4.3.5). Relative to the status quo, total economic benefits for the preferred alternative are expected to be lower by about $46.25 million.
    - The preferred alternative ranks 3rd in terms of total scallop revenues, producer and consumer surpluses, and net economic benefits.
    - The preferred alternative has a slight negative economic impact relative to Alternative 4 and status quo but slight positive impact compared to Alternative 1, Alternative 2 and Alternative 3 (Option 2).

It is important to note that actual prices, revenues, producer surplus, consumer surplus 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, consumer demand level in terms of per capita scallop consumption, 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.

Long-term Economic Impacts (FY2023 to FY2037)

The long-term economic impacts are summarized in Table 75 and Table 76. Economic values are discounted to present value terms at a market rate of 7 percent and at a lower discount rate of 3 percent. The economic estimates are in 2022 dollars.

- In the long-term, cumulative scallop landings ranged between 851.61 to 852.1 million pounds. They differ by less than 1 million pounds across alternatives in the long-term.

- The present value of the revenues for all alternatives including No Action are lower than status quo at both discount rates of 7 and 3 percent.

- At 7 percent discount rate, the present value of revenues expected to range from $7.285 billion in Alternative 2 Option 1 (Section 4.3.2.1) to $7.304 billion in Alternative 4 Option 2 (Section 4.3.4.2); producer surplus ranges from $5.951 in Alternative 2 Option 1 (Section 4.3.2.1) to $5.966 billion in Alternative 4 Option 2 (Section 4.3.4.2); and total economic benefits range from $6.835 in Alternative 2 Option 1 (Section 4.3.2.1) to $6.847 billion in Alternative 4 Option 2 (Section 4.3.4.2).

- At 3 percent discount rate, the present value of revenues expected to range from $9.434 billion in Alternative 2 Option 1 (Section 4.3.2.1) to $9.449 billion in Alternative 4 Option 2 (Section 4.3.4.2); producer surplus ranges from $5.951 billion in Alternative 2 Option 1 (Section 4.3.2.1) to $5.966 billion in Alternative 4 Option 2 (Section 4.3.4.2); and total economic benefits range from $8.891 billion in Alternative 2 Option 1 (Section 4.3.2.1) to $8.900 billion in Alternative 4 Option 2 (Section 4.3.4.2).

- The ranking of alternatives in the long-term matches with the short-term one for the Alternative 3 and Alternative 4 but Alternative 2. In the long-term, No Action alternative yields slightly higher economic benefits than the Alternative 2 with 10,000 pounds trip limits for both open area 22- and 24-DAS options.

- 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 22 to 24 DAS in open areas. Similarly, higher trip limits also yield higher revenues and total economic benefits.

Table 75. FW36 - Long-term Economic Impacts (2023-2037) (CPI based price adj in 2022 dollars): Cumulative present value (PV) of revenues, producer surplus and total economic benefits net of Status quo values (million $ in 2022 dollars, 7% Discount rate)

Alternatives/ Options		Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
	RUN	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
Economic Variables	**Units**								
Landings	Mil lbs.	**851.918**	**851.614**	**851.614**	**851.867**	**851.874**	**852.105**	**852.105**	**852.264**
Price _ALL	$/lb.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PV Revenue	Mil $	$7,282	$7,285	$7,289	$7,293	$7,296	$7,300	$7,304	$7,317
PV Revenue Difference from SQ	**Mil $**	**-$35**	**-$32**	**-$28**	**-$25**	**-$21**	**-$17**	**-$14**	**$0**
PV Producer Surplus	Mil $	$5,951	$5,951	$5,954	$5,958	$5,960	$5,964	$5,966	$5,977
PV Consumer Surplus	Mil $	$886	$883	$883	$883	$882	$882	$881	$879
PV Total Economic Benefits (PVPS+PVCS)	Mil $	$6,837	$6,835	$6,836	$6,841	$6,842	$6,846	$6,847	$6,856
PV Total Benefits Difference from SQ	**Mil $**	**-$19.16**	**-$21.43**	**-$20.21**	**-$15.49**	**-$14.35**	**-$10.04**	**-$8.82**	**$0.00**
Rank		**5**	**7**	**6**	**4**	**3**	**2**	**1**	

Table 76. FW36 - Long-term Economic Impacts (2023-2037) with Low Prices (CPI based price adj in 2022 dollars): Cumulative present value (PV) of revenues, producer surplus and total economic benefits net of Status quo values (million $ in 2022 dollars, 3% Discount rate)

Alternatives/Options		Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
	RUN	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
Economic Variables	**Units**								
Landings	Mil lbs.	**851.918**	**851.614**	**851.614**	**851.867**	**851.874**	**852.105**	**852.105**	**852.264**
Price _ALL	$/lb.	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PV Revenue	Mil $	$9,433	$9,434	$9,436	$9,440	$9,443	$9,446	$9,449	$9,459
PV Revenue Difference from SQ	**Mil $**	**-$27**	**-$26**	**-$23**	**-$19**	**-$17**	**-$13**	**-$11**	**$0**
PV Producer Surplus	Mil $	$7,724	$7,722	$7,723	$7,728	$7,729	$7,733	$7,734	$7,742
PV Consumer Surplus	Mil $	$1,172	$1,169	$1,168	$1,168	$1,167	$1,167	$1,166	$1,163
PV Total Economic Benefits (PVPS+PVCS)	Mil $	$8,895	$8,891	$8,891	$8,895	$8,895	$8,899	$8,900	$8,905
PV Total Economic Benefits Difference from SQ	**Mil $**	**-$9.58**	**-$13.84**	**-$13.71**	**-$9.29**	**-$9.25**	**-$5.29**	**-$5.14**	**$0.00**
Rank of Total Benefits		**5**	**7**	**6**	**4**	**3**	2	1	

- The long-term (FY2023-2037) economic impacts for the preferred alternative (Section 4.3.3.2) are evaluated. The long term annual economic values are discounted to present value at 7 percent and 3 percent.
    - The preferred alternative has cumulative projected landings of 851.87 million pounds over the period of 15 years. The long-term forecasts can help to identify trade-offs between short-term management measures by comparing how impacts of harvest in year 1 effect the scallop resource when applying the same assumptions across all alternatives. Since the Council generally sets specifications for one or two years, the long-term estimates should be interpreted as relative comparisons between measures, and not absolute values of future landings and economic impacts.
    - The preferred alternative's economic benefits (i.e., revenues, producer surplus, and total economic benefits) are higher than No Action, Alternative 2 and Alternative 3 (Option1) but they are slightly lower relative to Alternative 4.
    - The economic benefits for the preferred alternative are slightly lower than status quo scenario (Section 4.3.5).
    - The preferred alternative ranks 3rd among all alternatives considered at both discount rates (7% and 3%).
- Compared to SQ, the long-term present value of revenues, producer surplus and total economic benefits are lower for the preferred alternative Section 4.3.2.
- The cumulative present value of the revenue in the long run is highest for the Section 4.3.4.2 at about $9.45 billion (in 2022 dollars). With the exception of the No Action alternative, the cumulative present value of revenue ranged between $9.434 billion for Alternative 4.3.2.1 and $9.449 billion for Alternative 4 Option 2 (Section 4.3.4.2).
- With the exception of the No Action alternative, the cumulative present value of producer surplus in the long run ranged between $7.722 billion (Section 4.3.2.1) and $7.734 billion (Section 4.3.4.2). The differences in total economic benefit from SQ range between -$5.14 million (Section 4.3.4.2) and -$13.84 million (Section 4.3.2.1).
- The long-term economic impact of the preferred alternative is slightly negative relative to the Alternative 4 and status quo but it is slightly positive compared to Alternative 1, Alternative 2 and Alternative 3 (Option 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, which estimated the impact of landings and size composition on prices after taking into account the impact of exogenous variables. These variables include 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.

6.6.1.3.6 LAGC IFQ Allocations

The 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 77 shows 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 1,416,450 pounds. The share for the specification alternatives ranges from 1,125,860 pounds in Alternative 2 Option 1 (Section 4.3.2.1) to a high of 1,328,597 pounds in Alternative 4 Option 2 (Section 4.3.4.2).

Section 4.3.5 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 FW34, which would result in 1,416,450 pounds. Alternative 4 Option 2 (Section 4.3.4.2) has the highest LAGC IFQ allocation at 1,328,597 pounds with an expected revenue of $21.08 million (in 2022 dollars). The differences in revenue with status quo across alternatives range from about -$1.23 million to -$4.16 million. The highest-ranking alternative in terms of revenue is Alternative 4 Option 2 (Section 4.3.4.2) with about -5.52% less revenue than what is expected for the LAGC IFQ allocation under status quo.

Table 77 - Economic Impacts of the LAGC IFQ allocation for the 2023 fishing year.

Alternatives/Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (Preferred)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Runs/Alts	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
LAGC IFQ Share (lbs.)	993,572	1,125,860	1,186,366	1,196,794	1,257,179	1,268,213	1,328,597	1,416,450
LAGC IFQ Share (mt)	451	511	538	543	570	575	603	643
Price per lb (in 2022$)	$16.31	$16.11	$16.01	$16.04	$15.94	$15.96	$15.87	$15.75
Revenue (in 2022 $ mil)	$16.209	$18.142	$18.998	$19.194	$20.040	$20.242	$21.080	$22.311
Revenue Difference from SQ (in 2022$ mil)	-$6.102	-$4.169	-$3.313	-$3.118	-$2.271	-$2.069	-$1.231	$0
Percent Change in Revenue from SQ	-27.35%	-18.69%	-14.85%	-13.97%	-10.18%	-9.27%	-5.52%	0.00%

The Council's preferred alternative (Section 4.3.3.2) has a 1,257,179 million pounds LAGC IFQ share allocated. The preferred alternative could be expected to result in marginally lower landings and hence lower revenues for the LAGC IFQ component relative to SQ. It yields revenues of $19.194 million and the revenue is $2.271 million lower than status quo (Table 77). The preferred alternative has higher revenue relative to No Action, Alternative 2, and Alternative 3 (Option 1), but lower relative to Alternative 4 and status quo. The preferred alternative is expected to have a slightly lower economic impact compared to status quo.

6.6.1.3.7 Landings and size composition

- Projected landings under all specification alternatives (except for No Action) range from roughly 22.62 million to 26.30 million pounds in FY 2023. While projections suggest that landings could reach close to 55 million pounds during FY 2025 to FY2027 (Table 78), the Council plans to revisit its rotational management strategy again next year using different assumptions. However, over the long-term (FY2028 to FY2037), the projected landings for each specification alternative (including No Action) are expected to stabilize around 63 million pounds.
- The short- and long-term projected landings of U10s are shown in Table 79 and Table 81. 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 7.6 percent in FY2023 and is expected to stabilize around 4.85% to 5.8% in the long-term (FY 2025 to FY 2037).

Table 78. Estimated landings (Million lbs., Average per fishing year).

Average of Total landings	Scenarios							
Alternatives/ Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
2023	20.214	22.619	23.720	23.909	25.007	25.208	26.306	28.301
2024	33.440	31.541	31.107	31.182	30.748	30.810	30.375	30.834
2025-27	55.497	55.308	55.131	55.155	54.978	54.996	54.819	54.278
2028-37	63.177	63.153	63.139	63.131	63.118	63.110	63.097	63.029

Table 79. Projected landings of U10 scallops per year (million lbs.).

Average of L-U10	Scenarios							
Alternatives/ Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
2023	1.512	1.753	1.825	1.832	1.907	1.911	1.986	1.925
2024	3.468	3.217	3.179	3.155	3.117	3.091	3.053	3.177
2025-27	3.228	3.215	3.203	3.180	3.167	3.144	3.132	3.045
2028-37	3.070	3.070	3.069	3.064	3.062	3.056	3.056	3.041

Table 80. Historical landings of scallops by size category (in pounds).

Fishyear	'U10'_landing	'1120'_landing	'2130'_landing	31+ landing	'Unknown Category'_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	713,057	45,961,206
2021	6,056,458	21,654,887	9,824,152	4,641,362	760,029	42,936,888

Table 81. Biological projections - Percentage share of U10 scallops in total landings.

Average of U10PCTSH	Scenarios							
Alternatives/ Options	**Alt. 1**	**Alt. 2 Opt. 1**	**Alt. 2 Opt. 2**	**Alt. 3 Opt. 1**	**Alt. 3 Opt. 2 (*Preferred*)**	**Alt. 4 Opt. 1**	**Alt. 4 Opt. 2**	**Status Quo**
Fishing year groups	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
2023	7.48%	7.75%	7.70%	7.66%	7.63%	7.58%	7.55%	6.80%
2024	10.37%	10.20%	10.22%	10.12%	10.14%	10.03%	10.05%	10.30%
2025-27	5.82%	5.81%	5.81%	5.77%	5.76%	5.72%	5.71%	5.61%
2028-37	4.86%	4.86%	4.86%	4.85%	4.85%	4.84%	4.84%	4.82%

Table 82. Historical data: Percentage composition of scallop landings by size categories.

Fish year	'U10'_landing	'1120'_landing	'2130'_landing	31+ landing	'Unknown Category' 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	5.3	2.75
2017	19.00	54.84	23.61	0.72	1.83
2018	18.07	68.83	11.53	0.11	1.47
2019	19.78	63.21	13.50	1.75	1.74
2020	16.71	57.84	15.26	8.63	1.55
2021	14.11	50.43	22.88	10.81	1.77

Table 83. Scallop landings pounds per DAS (LPUE).

Average of LPUE-all	Scenarios							
Alts/ Options	**Alt. 1**	**Alt. 2 Opt. 1**	**Alt. 2 Opt. 2**	**Alt. 3 Opt. 1**	**Alt. 3 Opt. 2 (*Preferred*)**	**Alt. 4 Opt. 1**	**Alt. 4 Opt. 2**	**Status Quo**
Fishing year groups	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
2023	2,248	2,138	2,100	2,172	2,134	2,200	2,161	2,164
2024	2,294	2,262	2,258	2,250	2,246	2,238	2,234	2,253
2025-27	2,614	2,621	2,621	2,619	2,619	2,616	2,616	2,604
2028-37	2,719	2,719	2,719	2,719	2,719	2,719	2,719	2,718

6.6.1.3.8 Prices and Revenue

- Prices are estimated (Table 84) 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 36 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 FY2020 and FY2021 averaged to about $6.01 per pound); scallop exports will constitute about 13.7% of the domestic landings; per capita disposable income of about $54.77 thousands in FY2021 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 2021; 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 2021 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.

Table 84. Short-term Ex-Vessel Scallop Price Estimates* for FY2023 (in 2022 dollars) by FW36 Alternatives and Market Grades.

	Alternative/ Options	**Alt. 1**	**Alt. 2 Opt. 1**	**Alt. 2 Opt. 2**	**Alt. 3 Opt. 1**	**Alt. 3 Opt. 2 (*Preferred*)**	**Alt. 4 Opt. 1**	**Alt. 4 Opt. 2**	**Status Quo**
Price US$/lb.	**Fish Year**	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
Price U10	**2023**	$29.46	$28.81	$28.61	$28.58	$28.37	$28.35	$28.14	$28.10
Price 11 plus	**2023**	$15.63	$15.49	$15.42	$15.41	$15.35	$15.33	$15.27	$15.15
Price_ALL	**2023**	$16.31	$16.11	$16.01	$16.04	$15.94	$15.96	$15.87	$15.75

*Price model estimates are in 2021 dollars. The price estimates are later adjusted to 2022 dollars based on CPI.

Table 85. Scallop revenue per fishing year (undiscounted, Million dollars, in 2022 dollars (Adj to CPI)).

Average of REV-22	Scenarios							
Alternatives/ Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
2023	$329.768	$364.483	$379.831	$383.441	$398.630	$402.336	$329.768	$364.483
2024	$522.170	$495.437	$489.378	$490.284	$484.204	$484.954	$522.170	$495.437
2025-27	$775.349	$773.200	$771.224	$771.283	$769.292	$769.301	$775.349	$773.200
2028-37	$854.337	$854.098	$853.955	$853.839	$853.701	$853.573	$854.337	$854.098

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

- Total effort in terms of total DAS (Table 87, Table 88) are expected to be lower in the short-term in FY 2023 for all alternatives compared to the status quo. Changes in the employment level (
- Table 86) in the scallop fishery, as measured by CREW*DAS[19], is also expected to be lower compared to the status quo. Employment level is expected to decrease ranging from about 7% in Alternative 4 Option 2 (Section 4.3.4.2) to 19% in Alternative 2 Option 1 (Section 4.3.2.1). Expected employment for the FW36 alternatives in both short- and long-term are presented in
- Table 86.
- In the preferred alternative, the short-term (FY2023) employment level is expected at about 81,802 crew*DAS which is 12.36% lower than the status quo (
- Table 86).

- Fleet-wide trip costs (Table 89) in FY2023 for all alternatives including No Action are expected to be lower than SQ levels dollars as a result of lower Total DAS, but there are small differences in the magnitude of trip costs across specification alternatives. However, trip costs are expected to increase noticeably over the long-term. Trip cost per DAS in FY2023 is expected to increase by about 35% compared to last year which is primarily attributed to increasing fuel costs and general inflation recently.
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Table 86. Total employment level (i.e., Crew*DAS) and percent changes relative to the Status Quo in the short- and long-term by FW36 Alternatives

Alternatives / Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**
2023	62,225	73,207	78,161	76,162	81,102	79,303	84,244	90,486
2024	100,852	96,499	95,351	95,890	94,735	95,254	94,098	94,714
2025-27	440,091	437,247	435,863	436,431	435,053	435,586	434,195	431,850
2028-37	1,607,820	1,607,032	1,606,713	1,606,658	1,606,347	1,606,298	1,605,980	1,604,907
Grand Total	**2,210,988**	**2,213,985**	**2,216,088**	**2,215,140**	**2,217,237**	**2,216,441**	**2,218,517**	**2,221,957**
Percent change in employment level (Crew*DAS) from SQ:								
Short Run (FY2023)	-31.23%	-19.10%	-13.62%	-15.83%	-10.37%	-12.36%	-6.90%	0.00%
Long Run (FY2023-2037)	-0.49%	-0.36%	-0.26%	-0.31%	-0.21%	-0.25%	-0.15%	0.00%

[19] Employment in scallop fishery is as measured by average crew in a FT vessel times total days at sea (DAS).

Table 87. Projected DAS per FT vessel per year (including open and access areas).

Average of DAS/LA vessel	FW36 Scenarios							
Alternatives/ Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
2023	25.21	29.66	31.66	30.85	32.85	32.12	34.13	36.65
2024	40.85	39.09	38.63	38.84	38.38	38.59	38.12	38.37
2025-27	59.43	59.04	58.85	58.93	58.75	58.82	58.63	58.31
2028-37	65.13	65.10	65.09	65.08	65.07	65.07	65.06	65.01

Table 88. 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.							
Alternatives/ Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
2023	-31.23%	-19.10%	-13.62%	-15.83%	-10.37%	-12.36%	-6.90%	0.00%
2024	6.48%	1.89%	0.67%	1.24%	0.02%	0.57%	-0.65%	0.00%
2025-27	1.91%	1.25%	0.93%	1.06%	0.74%	0.87%	0.54%	0.00%
2028-37	0.18%	0.13%	0.11%	0.11%	0.09%	0.09%	0.07%	0.00%

Table 89. Trip costs per year for the scallop fleet (Undiscounted, in million 2022 dollars).

Average Trip Cost	FW36 Scenarios							
Alternatives/ Options	Alt. 1	Alt. 2 Opt. 1	Alt. 2 Opt. 2	Alt. 3 Opt. 1	Alt. 3 Opt. 2 (*Preferred*)	Alt. 4 Opt. 1	Alt. 4 Opt. 2	Status Quo
Fishing year groups	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ
2023	$28.036	$32.984	$35.216	$34.315	$36.541	$35.730	$37.957	$40.769
2024	$45.439	$43.478	$42.961	$43.204	$42.683	$42.917	$42.396	$42.674
2025-27	$66.095	$65.668	$65.460	$65.545	$65.338	$65.418	$65.210	$64.857
2028-37	$72.441	$72.406	$72.391	$72.389	$72.375	$72.372	$72.358	$72.310

6.6.1.3.10 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.

- All alternatives in Framework 36 have lower producer surplus relative to the status quo in the short-term. 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 FY2023, producer surplus (Table 74) is estimated to range between $272.8 million in Alternative 2 Option 1 (Section 4.3.2.1) to $318.39 million in Alternative 4 Option 2 (Section 4.3.4.2).

- Producer surplus for the preferred alternative (Section 4.3.3.2) is estimated to be about $301.73 million.

- 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 75.

- All alternatives in Framework 36 have lower consumer surplus relative to the status quo in the short-term.
- In FY2023, consumer surplus is predicted to range between approximately $16.84 million in Alternative 2 Option 1 (Section 4.3.2.1) to $22.53 million in Alternative 4 Option 2 (Section 4.3.4.2).
- Consumer surplus for the preferred alternative (Section 4.3.3.2) is estimated to be about $20.43.

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 75.

- 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 Status Quo. 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.
- Compared to status quo, total economic benefits in the short-term (FY2023) are lower in all alternatives for both with 22 and 24 DAS.
- Total economic benefits would be largest under Alternative 4 Option 2 (Section 4.3.4.2) which has 24 DAS and opens the CAII. Economic benefits are lowest under Alternative 2 Option 1 (Section 4.3.2.1), which allocated 22 DAS and keeps the CAII open.
- Total economic benefits range between $289.64 million in Alternative 2 Option 1 (Section 4.3.2.1) to $340.93 million in Alternative 4 Option 2 (Section 4.3.4.2).
- In the long-term, Alternative 4 Option 2 (Section 4.3.4.2) ranks highest and Alternative 2 Option 1 (Section 4.3.2.1) ranks lowest in total economic benefits. The preferred alternative ranks 3rd for overall economic benefits at both discount rates.
- Total economic benefit for the preferred alternative (Section 4.3.3.2) is estimated to be about $322.15 million. Total economic benefit for the preferred alternative ranks 3rd in the short run and is lower than status quo by about $46.25 million.

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

6.6.1.4.1 Alternative 1 – No Action

Alternative 1 would set LAGC IFQ access area trips at 357 trips to Area I, which is the number of trips specified through default measures in Framework 34.

6.6.1.4.2 Alternative 2 – Update LAGC IFQ Access Area Trip Allocations, Distribute Area II Access Area Allocation to the Nantucket Lightship North and Area II (*Preferred Alternative*)

Under Alternative 2, the total number of 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 full-time limited access component specified in Section 4.3. Table 10 shows the total number of LAGC IFQ trips that would be allocated based on the FT LA access area trip options being considered for FY2023 (i.e., two 10,000-pound trips per FT LA vessel, two 12,000-pound trips per FT LA vessel, and two 14,000-pound trips per FT LA vessel). Under the Council's preferred alternative in Section 4.3, the total LAGC IFQ access area allocation is 571 trips. This alternative will make the total LAGC IFQ access area trip allocation (i.e., 571 trips) available in both Area II and the Nantucket Lightship North. There would not be a specific number of trips allocated to Area II or the Nantucket Lightship North, but rather, vessels would be able to fish in either area and trips would be counted against the total trip allocation. Once the total trip allocation is projected to have been taken, both areas would be closed to LAGC IFQ access area fishing for the remainder of the fishing year. Once all LAGC IFQ trips have been taken, the LAGC IFQ component would be able to access the Nantucket Lightship North as part of open bottom. Alternative 2 could have positive economic impacts on LAGC IFQ vessels overall in the long run and compared to Alternative 1.

6.6.2 Social Impacts

6.6.2.1 Action 1 – Overfishing and Acceptable Biological Catch

6.6.2.1.1 Alternative 1 – No Action for OFL and ABC

Under No Action, the OFL and ABC would be set at the default values for FY 2023 OFL and ABC, which were adopted by the Council through FW34 (Table 2). The ABC excluding discards would be 23,200 mt and the ABC for FY 2024 would be 0 mt.

The social impacts of No Action would likely be moderate negative. With no change in the FY 2023 ABC from the default, there would be a degree of constancy and predictability for fishing industry operations. However, this ABC is 10% lower than that of FY 2022 (25,724 mt), which was a reduction from FY 2021. While fishery allocations are not linked to ABC (rather 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 than the No Action level 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 2024 would be 0 mt (i.e., there would be no fishery), unless the Council takes another 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 Updated OFL and ABC for FY 2023 and FY 2024 (*Preferred Alternative*)

Under Alternative 2, the OFL and ABC for FY 2023 would be set based on the results of the most recent stock assessment and at levels recommended by the SSC (Table 4). The ABC excluding discards would be 19,828 mt for FY 2023 and the default for FY 2024 would be 20,206 mt.

The social impacts of Alternative 2 would likely be moderate negative but more positive than No Action. The ABC in FY 2023 would be 23% lower than in FY 2022 (25,724 mt) and 15% lower than the FY 2023 default level. Like Alternative 1, Alternative 2 would continue the period of decreasing catch limits. While fishery allocations are not linked to ABC (rather 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 2024, 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 2023 would be in place: the NGOM Set-Aside for FY 2023 would be 465,980 lb, 25% lower than the FY 2022 Set-Aside (621,307 lb). No default would be set for FY 2024, and the area would close to directed scallop fishing.

The social impacts of No Action would likely be slight negative. With a 25% reduction in the Set-Aside from the FY 2022 level, but no change from the FY 2023 default, the fishery would continue to benefit from fishing in the NGOM, but at reduced levels. This degree of change could further 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 TAL may be higher than is biologically sustainable in the long term. 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 2024 would be 0 mt (i.e., there would be no fishery), unless the Council takes another 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 (Amendment 21, Section 5.6.8.4.3).

6.6.2.2.2 Alternative 2 — Set NGOM TAL, with set-asides to support research, monitoring, and a directed LAGC fishery (*Alternative 2 Option 3 is Preferred*)

Alternative 2 would specify a Northern Gulf of Maine Total Allowable Landings (NGOM TAL) limit for FY 2023 and FY 2024 (default), including set-asides to support research, monitoring, and a directed LAGC fishery. Option 1 (F=0.15) and Option 2 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank only. Options 3 (F=0.15) and Option 4 (F=0.18) would set the NGOM TAL using estimates of exploitable biomass from Stellwagen Bank, Ipswich Bay, and Jeffreys Ledge. There are four options for setting the NGOM TAL and Set-Aside at varying F rates that result in FY 2023 Set-Asides ranging from a low of 303,693 lb under Option 1 to a high of 458,016 lb under Option 4.

The social impacts of Alternative 2 would be uncertain but potentially moderate negative and more negative than No Action. The fishery would continue to benefit from fishing in the NGOM but at lower levels than under No Action. As growth assumptions for the Stellwagen Bank area of the NGOM are uncertain and could be overestimated, so there is uncertainty about the long-term sustainability of fishing under the options considered. While Options 1 and 2 are the most conservative, their impacts may be more positive in the longer-term. While Option 4 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.

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 4.1.2). 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 2023 specifications (default approved in Framework 34) would include 18 full-time LA open area DAS, 75% of the FY 2022 DAS. Part-time and occasional LA vessels would have 7.2 and 1.5 DAS, respectively. The total LAGC IFQ allocation would be 1,295,996 lb, 75% of the FY 2022 LAGC IFQ allocation. The target TAC for vessels with an LAGC incidental permit would be 50,000 lb. There would be no allocations specified for FY 2024.

The social impacts of No Action would be moderate negative. Fishing would be allowed, but at substantially reduced levels relative to FY 2022 (Section 4.3.5). Open area DAS would be set at 18 for FT LA vessels, with one 15,000 pound access area trip to CAII. Landings, revenue, and total economic benefits would likely be lower than Status Quo (FY 2022) and all other alternatives under consideration in Framework 36, providing fewer fishing opportunities. Employment (i.e., crew limit * DAS) is modeled to be lower in FY 2023 under No Action relative to Status Quo (

Table 86). Thus, the size of the fishery-related workforce could decrease, though the model predicts similar employment across the alternatives in later years. Fishermen could perceive the selection of No Action as a fishery management failure (e.g., no default for FY 2024). 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 2024, unless the Council takes another action to set specifications. 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.

6.6.2.3.2 Alternative 2 – Two access area trips in Area II with 10,000-pound trip limit

Under Alternative 2, specifications for access to the open areas and rotational access areas would be set for FY 2023 and default measures for FY 2024. The full-time LA vessels would have two access area trips to Area II (boundary expanded), each with a possession limit of 10,000 lb. Options 1 and 2 would set open area fishing at F=0.46 (22 DAS) and F=0.51 (24 DAS), respectively. The APL (after set-asides removed) under these options would be 20.5M lb and 21.6M lb, respectively.

The social impacts of both Alternative 2 options are likely slight positive and more positive than No Action. Landings, revenue, and total economic benefits would likely be higher than No Action, providing 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 less positive than the Alternative 3 options and Status Quo (FY 2022). Employment in FY 2022 is modeled to be lower under Alternative 2 Option 1 and higher under Option 2 relative to Status Quo (

Table 86). Thus, the size of the fishery-related workforce could change, though the model predicts similar employment across the alternatives in later years. Setting default measures for FY 2024 leads to greater predictability and business planning, which have positive social outcomes. 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.

6.6.2.3.3 Alternative 3 – Two access area trips in Area II with 12,000-pound trip limit (*Alternative 3 Option 2 is Preferred*)

Alternative 3 is like Alternative 2, except that the possession limit for the two trips would be 12,000 lb. The APL (after set-asides removed) under these options would be 21.8M lb and 22.9M lb, respectively.

The social impacts of both Alternative 3 options are likely slight positive and more positive than No Action. Landings, revenue, and total economic benefits would likely be higher than No Action, providing more fishing opportunities and participation and more positive social impacts. Social impacts of the Alternative 3 options are likely negligible relative to each other, more positive than Alternative 2 options and less positive than the Alternative 3 options and Status Quo (FY 2022). Employment in FY 2022 is modeled to be lower under Alternative 3 Option 1 and higher under Option 2 relative to Status Quo (

Table 86). Thus, the size of the fishery-related workforce could change, though the model predicts similar employment across the alternatives in later years. Setting default measures for FY 2024 leads to greater predictability and business planning, which have positive social outcomes. 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.

6.6.2.3.4 Alternative 4 – Two access area trips in Area II with 14,000-pound trip limit

Alternative 4 is like Alternatives 2 and 3, except that the possession limit for the two trips would be 14,000 lb. The APL (after set-asides removed) under these options would be 23.1M lb and 24.2M lb, respectively.

The social impacts of both Alternative 4 options are likely slight positive and more positive than No Action. Landings, revenue, and total economic benefits would likely be higher than No Action, providing more fishing opportunities and participation and more positive social impacts. Social impacts of the Alternative 4 options are likely negligible relative to each other, more positive than the Alternative 2 and 3 options and less positive than Status Quo (FY 2022). Employment in FY 2022 is modeled to be lower under Alternative 3 Option 1 and higher under Option 2 relative to Status Quo (

Table 86). Thus, the size of the fishery-related workforce could change, though the model predicts similar employment across the alternatives in later years. Setting default measures for FY 2024 leads to greater predictability and business planning, which have positive social outcomes. 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.

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 FW34)

Under Alternative 1, the FY 2023 LAGC IFQ access area trips, with a 800 lb trip limit, would be 357 trips to Area I, the default from Framework 34.

The social impacts of No Action are likely moderate negative. For FY 2022, there were 1,071 access area trips allocated for this fishery component to the Area I and Nantucket Lightship-South 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 2024, unless the Council takes another action to set the ABC.

6.6.2.4.2 Alternative 2 – Update LAGC IFQ Access Area Trip Allocations, Distribute Area II Access Area Allocation to the Nantucket Lightship North and Area II (*Preferred Alternative*)

Under Alternative 2, the FY 2023 LAGC IFQ access area trips would range from 476 to 666, depending on the alternative selected in Action 3, 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 Area 2 and vessels could choose which area to fish in.

The social impacts of Alternative 2 are likely slight negative but more positive than No Action. For FY 2022, there were 1,071 access area trips allocated for this fishery component, so Alternative 2 would result in a reduction from present conditions but an increase from No Action. 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 two access areas, so vessels based in a wider geographic range of ports could benefit from fishing in the access areas relative to No Action, and there would be flexibility in which area to fish. Given Area 2 is offshore of Nantucket Lightship North, there may be more safety risks from fishing there relative to NLS-N.

6.7 CUMULATIVE EFFECTS ANALYSIS

6.7.1 Introduction

The purpose of the CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. The intent is to focus on those effects that are truly meaningful. The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed Atlantic sea scallop fishery.

A cumulative effects assessment makes effect determinations based on a combination of: 1) impacts from past, present, and reasonably foreseeable future actions; 2) the baseline conditions of the VECs (the combined effects from past, present, and reasonably foreseeable future actions plus the present condition of the VEC); and 3) impacts of the alternatives under consideration for this action.

6.7.1.1 Consideration of the Valued Ecosystem Components (VECs)

The valued ecosystem components for the Atlantic sea scallop fishery are generally the "place" where the impacts of management actions occur and are identified in Section 5.0.

- *Target Species (Atlantic sea scallop, Placopecten magellanicus)*
- *Non-target species*

- *Physical environment / Essential Fish Habitat*
- *Protected species*
- *Human communities – Economic Impacts and Social Impacts*

The CEA identifies and characterizes the impacts on the VECs by the alternatives under consideration when analyzed in the context of other past, present, and reasonably foreseeable future actions.

6.7.1.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the commercial harvest of Atlantic sea scallops in the western Atlantic Ocean. Scallops are managed as a single stock throughout their range, and the core geographic scope for the managed species is the Northeast U.S. Shelf, which extends from Cape Hatteras to the Bay of Fundy (Section 5.5). For non-target species, that range may be expanded and would depend on the range of each species in the Northeast U.S. Shelf Ecosystem. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by Atlantic sea scallops, and non-target species in Northeast U.S. Shelf Ecosystem. The core geographic scope for protected species is their range in the Northwest Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities in coastal states from North Carolina to Maine directly involved in the harvest or processing of Atlantic sea scallops (Section 5.6).

6.7.1.3 Temporal Boundaries

Overall, while the effects of the historical sea scallop fishery are important and considered in the analysis, the temporal scope of past and present actions for sea scallops, non-target species and other fisheries, the physical environment and EFH, and human communities (economic and social) is primarily focused on actions that occurred after FMP implementation in 1982. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery. For protected species, the scope of past and present actions is focused on the 1980s and 1990s (when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ) through the present.

The temporal scope of future actions for all VECs extends about five years (2028) into the future beyond the implementation of this action. The dynamic nature of resource management for Atlantic sea scallops and lack of information on projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty. The impacts discussed in this section are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

6.7.2 Relevant Actions Other Than Those Proposed in this Document

This section summarizes the past, present, and reasonably foreseeable future actions and effects that are relevant for these cumulative effects assessment. Some past actions are still relevant to the present and/or future actions.

6.7.2.1 Fishery Management Actions

6.7.2.1.1 Target Species (Atlantic Sea Scallop)

Past, present, and reasonably foreseeable future actions for sea scallop management include the establishment of the original FMP, all subsequent amendments and frameworks, and the setting of annual specifications (annual catch limits and measures to constrain catch and harvest). Key actions are described below.

Past and Present Actions: The Council established the Scallop FMP in 1982. Amendment 4 was implemented in 1994 and introduced major changes in scallop management, including a limited access program to stop the influx of new vessels. Qualifying vessels were assigned different day-at-sea (DAS) limits according to which permit category they qualified for: full-time, part-time or occasional. Some of the more notable measures included new gear regulations to improve size selection and reduce bycatch, a vessel monitoring system to track a vessel's fishing effort, and an open access general category scallop permit was created for vessels that did not qualify for a limited access permit. Also in 1994, Amendment 5 to the Northeast Multispecies FMP closed large areas on Georges Bank to scallop fishing over concerns of finfish bycatch and disruption of spawning aggregations (Closed Area I, Closed Area II, and the Nantucket Lightship Area).

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

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

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

As the scallop resource rebuilt under area rotation, biomass increased inshore and fishing pressure increased by open access general category vessels starting in 2001. Landings went from an average of about 200,000 pounds from 1994-2000 to over one million pounds consistently from 2001-2003 and 3-7 million pounds each year from 2004-2006 (NEFMC, 2007). In June 2007 the Council approved Amendment 11 to the Scallop FMP and it was effective on June 1, 2008. The main objective of the action was to control capacity and mortality in the general category scallop fishery. Amendment 11 implemented a limited entry program for the general category fishery where each qualifying vessel received an individual allocation in pounds of scallop meat with a possession limit of 400 pounds. The fleet of qualifying vessels receives a total allocation of 5% of the total projected scallop catch each fishing year. This action also established separate limited entry programs for general category fishing in the Northern Gulf of Maine and an incidental catch permit category (up to 40 pounds of scallop meat per trip while fishing for other species).

Amendment 15 to the Scallop FMP was implemented in 2011. This action brought the FMP in compliance with new requirements of the re-authorized MSA, namely through the establishment of annual catch limits (ACLs) and accountability measures (AMs). The amendment also established sub-ACLs and AMs for yellowtail flounder, addressed excess capacity in the LA scallop fishery, and adjusted several aspects of the overall program to make the Scallop FMP more effective, including making essential fish habitat closures consistent under both the scallop and groundfish FMPs for scallop vessels.

Amendment 19 to the Scallop FMP changed the start of the fishing year from March 1 to April 1 and created new options for streamlining the scallop specifications.

Framework 28 revised the way the Council allocated quota to the LAGC IFQ component to reflect the spatial management of the scallop fishery. The action also established a 50-bushel shell stock possession limit for limited access vessels inshore of the days-at-sea demarcation line north of 42° 20′ N. lat.

Framework 29 changed flatfish AMs from time and area closures to a gear modification for SNE/MA yellowtail flounder, Georges Bank yellowtail flounder, and Northern windowpane.

Amendment 21 to the Scallop FMP became effective on March 31, 2022. This action adjusted the management measures for scallop fishing in the NGOM management area, increased the LAGC IFQ possession limit in access areas to 800 pounds, and allowed Limited Access (LA) vessels with IFQ to transfer quota to LAGC IFQ-only vessels.

Reasonably Foreseeable Future Actions: The Council will continue to update scallop specifications on an annual or biannual schedule. The Council is in the process of developing an action for access to the Northern Edge Habitat Management Area, including development of a scallop access area program for a new access area..

6.7.2.1.2 Non-Target Species:

Past and Present Actions: The Northeast Multispecies FMP has a multitude of management measures. Past actions to the regulated groundfish stocks have been documented in past scallop actions (see Amendment 19). Amendment 13 implemented a range of measures to minimize the impacts of bottom trawling in the GOM, GB and SNE. That action closed 2,811 square nautical miles (Habitat Closed Areas) to all bottom-tending mobile fishing gear, including scallop dredges. Amendment 16 established a new sector allocation system for the fishery and identified a process for setting annual catch limits (ACLs) for all groundfish species. Framework 44 (2010) provided an incentive for scallop fishermen to reduce their yellowtail flounder bycatch in order to maximize scallop yield. The Council required that all limited access vessels be required to land all legal-sized yellowtail flounder, which will improve data quality. Framework 47 (2012) removed the cap that limited the catches of yellowtail flounder in the Georges Bank access areas to 10 percent of the ACL. This action also implemented AMs for the scallop fishery if the overall ACLs for either Georges Bank or SNE/MA are exceeded, or, if the total ACL for a given broad stock area is not exceeded but the scallop fishery exceeds its sub-ACL for that area by 50 percent or more. This action enabled an in-season yellowtail flounder transfer to the groundfish fishery. Framework 48 (2013) implemented a sub-ACL for southern windowpane flounder to the scallop fishery, a sub-ACL allocation of GB yellowtail for the scallop fishery of 40% of the US ACL in 2013, and a set allocation of 16% for future years. Framework 47 – and subsequent actions – modified the scallop fishery AM implementation policy so that the scallop fishery would only have an AM for GB yellowtail flounder and northern windowpane flounder if it exceeded its sub-ACL, and the overall ACL was exceeded.

Amendment 23 to the Northeast Multispecies FMP was initiated by the Council in 2017 to implement measures to improve reliability and accountability of catch reporting and to ensure a precise and accurate representation of catch (i.e., landings and discards). The amendment was implemented on January 9, 2023, and included regulatory changes that expand electronic monitoring technologies as an alternative to human observers and changed the method used to determine total monitoring coverage rate, among other monitoring related measures. This action may have a slight positive impact on Georges Bank yellowtail flounder and Southern New England yellowtail flounder if additional monitoring improves the information for stock assessments and management decisions.

6.7.2.1.3 Physical Habitat/EFH

The EFH Omnibus Amendment 2 (April 2018) reviewed and updated EFH designations, identified Habitat Areas of Particular Concern, and updated the status of current knowledge of gear impacts. It also implemented new spatial management measures throughout New England for minimizing the adverse impact of fishing on EFH that affect all species managed by the NEFMC. The Council developed a related omnibus framework (Clam Dredge Framework, implemented June 2020) that designated three exemption areas within the Great South Channel Habitat Management Area where clam and mussel dredges are allowed. The Council also recently developed a deep-sea coral amendment (implemented July 2021) to protect deep-sea coral habitats throughout New England

from the negative impacts of fishing gears. The amendment designates the Georges Bank Deep-Sea Coral Protection Zone between the US/Canada EEZ boundary, the boundary between the NEFMC and MAFMC regions, and the seaward boundary of the US EEZ, with the landward boundary at the 600 m contour. The zone is closed to all bottom-tending gears, with an exemption for the red crab pot fishery. Two mobile bottom-tending gear closures were implemented in federal waters in eastern Maine.

6.7.2.1.4 Protected Resources

The primary protected species impacted by the scallop fishery are sea turtles; however, there is the potential, albeit low, for interactions with Atlantic sturgeon (see Section 5.4). The scallop FMP has several measures that minimize impacts to sea turtles. Specifically, in 2006, federally permitted scallop vessels fishing with dredge gear had to modify their gear by adding chain mats. The purpose of the chain mat is to prevent sea turtle captures in the dredge bag and injury and mortality that results from such capture. In addition, Framework 23 (2012) to the Scallop FMP required all dredges greater than 10 feet 6 inches fishing in the Mid-Atlantic from May-October to use a turtle deflector dredge (TDD) to minimize impacts of the scallop fishery on sea turtles.[20] As of May 2015, both gear modifications are required in waters west of 71°W from May 1 through November 30 each year (76 FR 22119, April 21, 2015).

General reductions in scallop fishing have also likely reduced the risk of interactions with protected species. In general, scallop effort has declined (e.g., reduced DAS allocations and access area trips) over the years and catch per-unit-of-effort has increased dramatically under area rotation, implemented through Amendment 10 in 2004. In more recent years scallop effort has shifted from the Mid-Atlantic region to areas of Georges Bank, which may have had the effect of reducing potential risks to sea turtles given that sea turtle encounter rates are lower on Georges Bank relative to the Mid Atlantic (see Section 5.4). Over time, a should the Georges Bank scallop resource become reduced and the Mid-Atlantic areas rebound, a reverse shift in effort from an area of low use for turtles to high use areas in the Mid-Atlantic may potentially increase the risk of interactions from current levels. Accordingly, impacts to protected species (i.e., ESA-listed species of sea turtles and Atlantic sturgeon) could shift back and forth over the years under the management scheme implemented under Amendment 10. Since modifications to NEFMC management actions will occur through framework adjustments and plan amendments, they will undergo additional review to assess impacts to protected species.

Other non-scallop fishery actions that have been implemented over the last decade to protect sea turtles include: requiring turtle excluder devices (TEDs) in summer flounder trawls large mesh-size , gillnet regulations, prohibitions on the use of pound net leaders, circle hook and bait requirements for pelagic longline gear, and sea turtle handling and resuscitation requirements.

6.7.2.1.5 Human Communities

All actions taken under the Scallop FMP have had effects on human communities. None have specifically been developed to primarily address elements of fishing related businesses and communities, but many actions have included specific measures designed to improve flexibility and efficiency. Some actions that limit participation, such as the limited entry program that was adopted under Amendment 4 and Amendment 11 for the general category fishery had distributional impacts on individuals and ports that participated in the scallop fishery at that time. Amendment 21 to the Scallop FMP implemented a TAL sharing arrangement in the NGOM that impacted how some segments of the fishery can participate in the NGOM fishery.

[20] The key elements of the TDD are a forward cutting bar, a reduced number of bale bars, and reduced spacing of struts; these elements are expected to reduce the likelihood of a turtle passing under the dredge frame and getting stuck in the dredge frame.

6.7.2.1.6 Other Fishery Management Actions

In addition to the Atlantic Sea Scallop FMP, there are other FMPs and associated fishery management actions for other species that impacted these VECs over the temporal scale described in Section 6.7.1.3. These include FMPs managed by the Mid-Atlantic Fishery Management Council, New England Fishery Management Council, Atlantic States Marine Fisheries Commission, and to a lesser extent the South Atlantic Fishery Management Council. Omnibus amendments are also frequently developed to amend multiple FMPs at once. Actions associated with other FMPs and omnibus amendments have included measures to regulate fishing effort for other species, measures to protect habitat and forage species, and fishery monitoring and reporting requirements.

6.7.2.1.7 Fishery Management Action Summary

The Council has taken many actions to manage the commercial fisheries in its jurisdiction. Actions taken in other FMPs, and some Omnibus Actions are described in Section 6.7.1.2. The MSA is the statutory basis for federal fisheries management. The cumulative impacts on the VECs of past, present, and reasonably foreseeable future federal fishery management actions under the MSA should generally be associated with positive long-term outcomes because they control fishing effort and manage stocks at sustainable levels. A summary of the cumulative impacts of past, present, and reasonably foreseeable future actions on each VEC is provided in Table 90.

Table 90 – Summary of expected impacts of combined past, present, and reasonably foreseeable future actions on each VEC.

VEC	Past Actions (P)	Present Actions (Pr)	Reasonably Foreseeable Future Actions (RFFA)	Combined Effects of Past, Present, and Future Actions
Managed Resources	**Positive** Combined effects of past actions have controlled effort and provided a sustainable fishery on a rebuilt resource	**Positive** Current regulations continue to manage for a sustainable stock	**Positive** Future actions are anticipated to strive to maintain a sustainable stock	**Positive** Scallop resource is rebuilt; Stock is being managed for sustainability
Non-Target Species	**Mixed** Gear modifications & time/area closures to reduce bycatch; reactive aMs in place; bycatch concerns remain for GF stocks	**Slight Positive** Current regulations continue to implement and expand measures to reduce bycatch; bycatch concerns remain for GF stocks	**Slight Positive** Future actions will likely improve monitoring and further address bycatch issues	**Slight Positive** Gear modifications & time/area closures to reduce bycatch; reactive aMs in place; some stocks remain in poor condition
Habitat	**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive, but fishing activities and non-fishing activities have reduced habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive, but fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and habitat impacts but as stocks improve, effort may increase along with additional non-fishing activities	**Mixed** Continued management of physical environment and EFH for an increased quality of habitat. Fishing activities and non-fishing activities continue to reduce habitat quality
Protected Resources	**Negligible to slight Positive** Combined effects of past fishery actions have required gear modifications and reduced effort and thus interactions with protected resources	**Negligible to Slight Negative** Current regulations continue to control effort and require gear modifications, thus reducing opportunities for interactions	**Mixed** Future regulations will likely maintain gear modifications and control effort and thus protected species interactions; fishery is anticipated to have some level of interaction with protected species	**Mixed** Continued use of gear modifications and effort controls along with past regulations will likely help stabilize protected species interactions at low levels.
Human Communities (Social and Economic Impacts)	**Positive** Effort controls and rotational management are maintained or strengthened	**Positive** Management actions continue to use effort controls and rotational management, at times reducing short-term revenues, while improving yield. Stock improvements continue to benefit human communities in the long term; price and revenues are generally increasing	**Positive** Future regulations will likely control effort and utilize rotational management, thus reduce revenues at times, but long-term maintenance of sustainable stock will lead to long-term economic and social benefits to human communities	**Positive** Continued fisheries management will likely control effort for a sustainable fishery and thus fishery and non-fishery related activities will continue; sustainable management should improve community benefits in long-term

6.7.2.2 Non-Fishing Impacts

6.7.2.2.1 Other Human Activities

Non-fishing activities that occur in the marine nearshore and offshore environments and connected watersheds can cause the loss or degradation of habitat and/or affect the fish and protected species that utilize those areas. The impacts of most nearshore, human-induced, non-fishing activities tend to be localized in the areas where they occur, although effects on species could be felt throughout their populations since many marine organisms are highly mobile. For offshore projects, some impacts may be localized while others may have regional influence, especially for larger projects. The following discussion of impacts is based on past assessments of activities and assumes these activities will continue as projects are proposed.

Examples of non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore wind farms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these activities primarily stem from habitat loss due to human interaction and alteration or natural disturbances. These activities are widespread and can have

localized impacts on habitat related to accretion of sediments, pollutants, habitat conversion, and shifting currents and thermoclines. For protected species, primary concerns associated with non-fishing activities include vessel strikes, dredge interactions (especially for sea turtles and sturgeon), and underwater noise. These activities have both direct and indirect impacts on protected species. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the productivity of managed species, non-target species, and protected species. Decreased habitat suitability tends to reduce the tolerance of these VECs to the impacts of fishing effort. Non-fishing activities can cause target, non-target, and protected species to shift their distributions away from preferred areas and may also lead to decreased reproductive ability and success (from current changes, spawning disruptions, and behavior changes), disrupted or modified food web interactions, and increased disease. While localized impacts may be more severe, the overall impact on the affected species and their habitats on a population level is unknown, but likely to have impacts that mostly range from no impact to slight negative, depending on the species and activity.

Non-fishing activities permitted by other Federal agencies (e.g., beach nourishment, offshore wind facilities) require examinations of potential impacts on the VECs. The MSA imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH (50 CFR 600.930). NMFS and the eight regional fishery management councils engage in this review process by making comments and recommendations on federal or state actions that may affect habitat for their managed species. Agencies need to respond to, but do not necessarily need to adopt these recommendations. Habitat conservation measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally-permitted activities could have on resources under NMFS' jurisdiction. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by Federal, state, and local authorities. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2)[21], which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

In recent years, offshore wind energy has become an important activity in the Greater Atlantic region. This development is expected to impact all VECs, as described below. Offshore wind farms include the installation of turbines into the seabed, interarray cables connecting the turbines, and export cables to transfer electricity to shore. Site assessment occurs over a period of a few years, construction occurs over 1-2 years, and the wind farm operates for about 25 years.

Impacts of offshore wind energy development on Biological Resources (Target species, Non-target species, Protected Species) and the Physical Environment

Construction activities may have both direct and indirect impacts on marine resources, ranging from temporary changes in distribution to injury and mortality. Impacts could occur from changes to habitat in the areas of wind turbines and cable corridors and increased vessel traffic to and from these areas. Species that reside in affected wind farms year-round may experience different impacts than species that seasonally reside in or migrate through these areas. Species that typically reside in areas where wind turbines are installed may return to the area and adapt to habitat changes after construction is complete. Inter-array and electricity export cables will generate electromagnetic fields, which can affect patterns of movement, spawning, and recruitment success for various species. Effects will depend on cable type, transmission capacity, burial depth, and proximity to other cables. Substantial structural changes in habitats associated with cables are not expected unless cables are left unburied (see below). Surface lay or shallow burial is not the preferred approach because it places the cable at risk, but may be required in bottom types where trenching is not possible or when crossing another cable. In such instances concrete mats are used to cover the cable. However, the cable burial process may alter sediment composition

21 "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat."

along the corridor, thereby affecting infauna and emergent biota. Taormina et al. (2018) provide a recent review of various cable impacts, and Hutchinson et al. (2020) and Taormina et al. (2020) examine the effects of electromagnetic fields in particular.

The full build out of offshore wind farms will result in broad habitat alteration. The wind turbines will alter hydrodynamics of the area, which may affect primary productivity and physically change the distribution of prey and larvae. It is not clear how these changes will affect the reproductive success of marine resources. Scour and sedimentation could have negative effects on egg masses that attach to the bottom. Benthic habitat will be altered due to the placement of scour protection at wind turbine foundations, and over cables that are not buried to target depth in the sediment, converting soft substrates into hard substrates. This could alter species composition and predator/prey relationships by increasing favorable habitat for some species and decreasing habitat for others. The placement of wind turbines will also establish new vertical structure in the water column, which could serve as reefs for bottom species, fish aggregating devices for pelagic species, and substrate for the colonization of other species, e.g., mussels. Various authors have studied these types of effects (e.g., Bergström et al. 2013; Dannheim et al. 2019; Degraer et al. 2019; Langhamer 2012; Methratta & Dardick 2019; Stenberg et al. 2015).

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape[22]. Temporary, acute, noise impacts from construction activity could impact reproductive behavior and migration patterns; the long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015; Finneran 2016; Madsen et al. 2006; Nowacek et al. 2007; NRC 2000; 2003; 2005; Popper et al. 2014; Richardson et al. 1995; Thomsen et al. 2006). Exposure to underwater noise can directly affect species via behavioral modification (avoidance, startle, spawning) or injury (sound exposure resulting in internal damage to hearing structures or internal organs) (Bailey et al. 2014; Bailey et al. 2010; Bergström et al. 2014; Ellison et al. 2011; Ellison et al. 2018; Forney et al. 2017; Madsen et al. 2006; Nowacek et al. 2007; NRC 2003; 2005; Richardson et al. 1995; Romano et al. 2004; Slabbekoorn et al. 2010; Thomsen et al. 2006; Wright et al. 2007). Indirect effects are likely to result from changes to the acoustic environment of the species, which may affect the completion of essential life functions (e.g., migrating, breeding, communicating, resting, foraging)[23] (Forney et al. 2017; Richardson et al. 1995; Slabbekoorn et al. 2010; Thomsen et al. 2006).

Wind farm survey and construction activities and turbine/cable placement will substantially affect NMFS existing scientific research surveys, including stock assessment surveys for fisheries and protected species[24] and ecological monitoring surveys. Disruption of such scientific surveys could increase scientific uncertainty in survey results and may significantly affect NMFS' ability to monitor the health, status, and behavior of marine resources and protected species and their habitat use within this region. Based on existing regional Fishery Management Councils' acceptable biological catch control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and recreational harvest limits that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower associated fishing revenue and reduced recreational fishing opportunities, which could result in indirect negative impacts on fishing communities. It is possible that new survey technologies will be developed that mitigate these impacts, but it is uncertain whether they will be developed, and(or) how quickly they can be adopted. NOAA and BOEM published a survey mitigation strategy in December 2022.[25]

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22 See NMFS Ocean Noise Strategy Roadmap: https://cetsound.noaa.gov/Assets/cetsound/documents/Roadmap/ONS_Roadmap_Final_Complete.pdf

23 See NMFS Ocean Noise Strategy Roadmap (footnote #2)

24 Changes in required flight altitudes due to proposed turbine height would affect aerial survey design and protocols (BOEM 2020a).

25 https://www.fisheries.noaa.gov/resource/document/federal-survey-mitigation-strategy-northeast-us-region

Impacts of Offshore Wind Energy Development on Socioeconomic Resources

One offshore wind pilot project off Virginia installed two turbines in 2020**.** Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Massachusetts to North Carolina (see leasing map below – Map 12). According to BOEM, approximately 22 gigawatts (close to 2,000 wind turbines based on current technology) of Atlantic offshore wind development via 19 projects are reasonably foreseeable along the east coast by 2030 (BOEM 2021). BOEM has begun a planning process for the Gulf of Maine via a regional intergovernmental renewable energy task force (https://www.boem.gov/Gulf-of-Maine). It is not clear at this time where development might occur in the Gulf of Maine. Given the water depth in the region, floating turbines will likely be deployed in the area. BOEM has also begun a planning process for the Central Atlantic region, and as of November 2022 has issued draft wind energy areas (**Map 13**). As the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities.

Offshore wind energy development is being considered in parts of the outer continental shelf that overlap with the Atlantic sea scallop resource, specifically lease and call areas off of New York and New Jersey. South of Long Island, the NY Lease OCS-A 0512 to Equinor Wind US overlaps with scallop fishing grounds, while NJ Lease OCS-A 0499 (Atlantic Shores Offshore Wind) and NJ Lease OCS-A 0498 (Ocean Wind) are in a transit area for scallop vessels fishing out New Jersey ports, particularly Point Pleasant and Barnegat Light. In the Mid-Atlantic, areas of the New York Bight south of Long Island and east of New Jersey were auctioned on February 23, 2022[26]. The six leases directly overlap or are adjacent to important scallop fishing groups (**Map 12**). The scallop fishery has been active in these areas and is expected to be for the near future (**Map 12**). The social and economic impacts of offshore wind energy on fisheries could be generally negative due to the overlap of wind energy areas with productive scallop fishing grounds. Impacts may vary by year based on recruitment and rotational management measures. NOAA analysis of fishing activity at each lease site is available here: https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development.

It is worth noting that this analysis represents only a rough approximation of potential effects from the areas; however, because this productive region of the resource would be expected to support scallop fishing in the future in the absence of offshore wind energy development, any restriction of fishing access to this region as a result of offshore wind energy development would be perceived as a negative overall effect to the fishery and fishing communities. In some cases, effort could be displaced to another area, which could compensate for potential economic losses if vessel operators choose not to operate in the wind energy areas.

Despite the likely negative impacts on the scallop fishery, there could also be social and economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable sources (Association 2020).

It remains unclear how fishing or transiting to and from fishing grounds (whether or not those grounds are within a wind farm) might be affected by the presence of a wind farm. While no offshore wind developers have expressed an intent to exclude fishing vessels from wind turbine arrays once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing and orientation of the array and weather conditions.[27] If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative social and economic impacts to affected communities, including increased user conflicts, decreased catch and associated

[26] https://www.boem.gov/renewable-energy/state-activities/new-york-bight

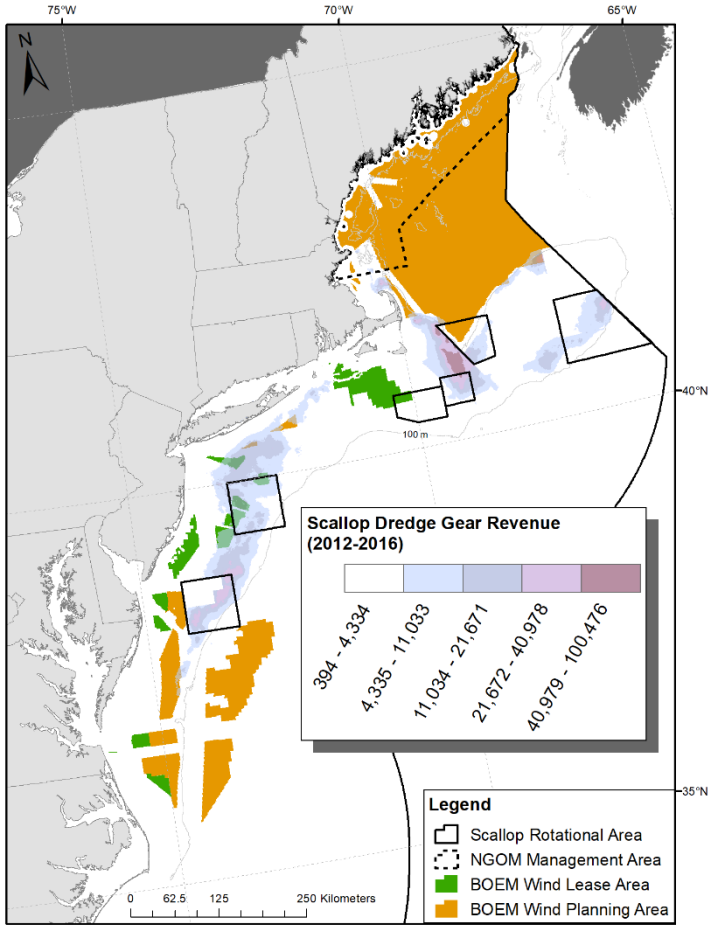
27 The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study, and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (UCSG 2020).

revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind farms, effects could be negative due to user conflicts, gear damage/loss, and increased risk of allision or collision.

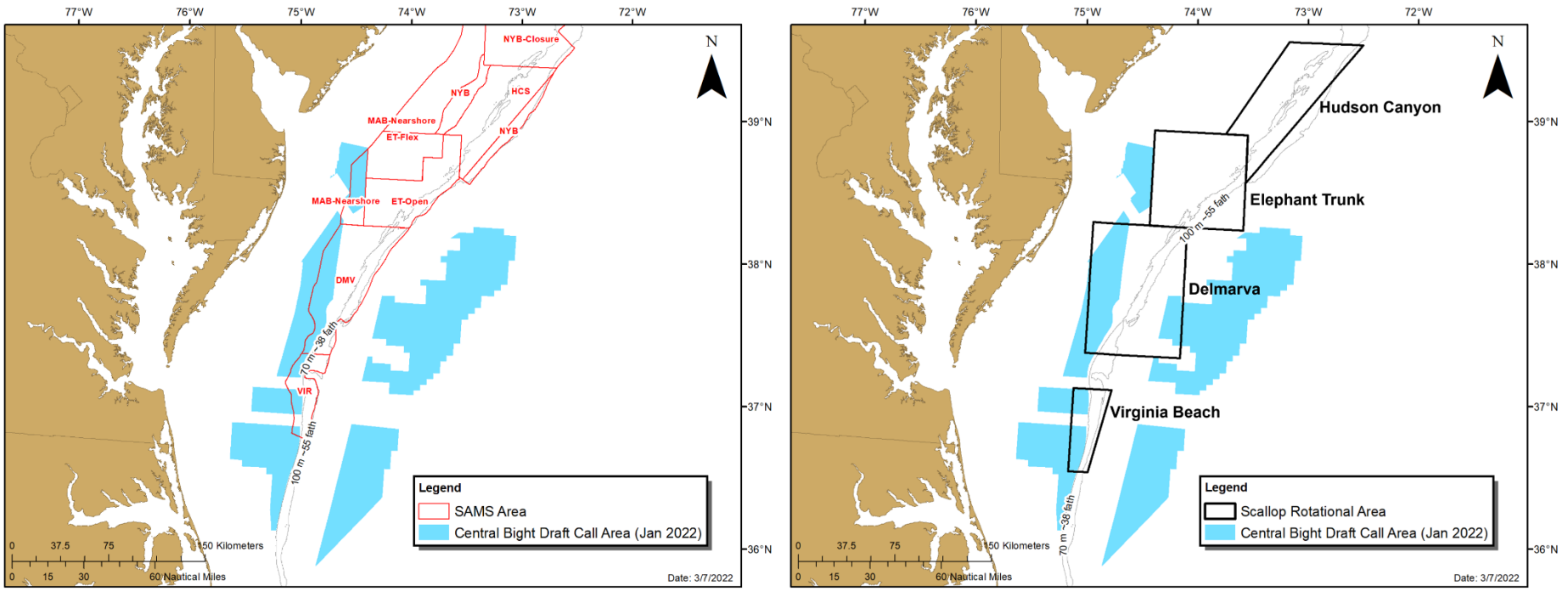
Offshore Energy Summary

Offshore wind energy development is expected to have negative impacts on the scallop resource at a population level. The magnitude of these negative impacts is likely to depend on the number and locations of projects that occur. The individual project phases (site assessment, construction, operation, and decommissioning) as well as different aspects of the technology (foundations, cables/pipelines, turbines) will have varying negative impacts on the scallop resource and fishery. Mitigation efforts, such as habitat conservation measures, time of year construction restrictions, layout modifications, and fishery compensation funds could lessen the magnitude of negative impacts as well. The overall social and economic impacts on the Atlantic sea scallop fishery are likely to be negative due to displacement and disruption of commercial fishing effort on productive scallop grounds. For example, an analysis of vessel trip reports (VTRs) estimated that fishing grounds off of Long Island, NY (i.e., within the New York Bight lease areas) supported a considerable level of overall scallop fishery landings and revenues between 2012 and 2016 (Map 12). It is worth noting that this analysis represents only a rough approximation of potential effects from the NY Bight Lease Areas; however, because this productive region of the resource would be expected to support scallop fishing in the future in the absence of offshore wind energy development, any restriction of fishing access to this region as a result of offshore wind energy development would be perceived as a negative overall effect to the fishery.

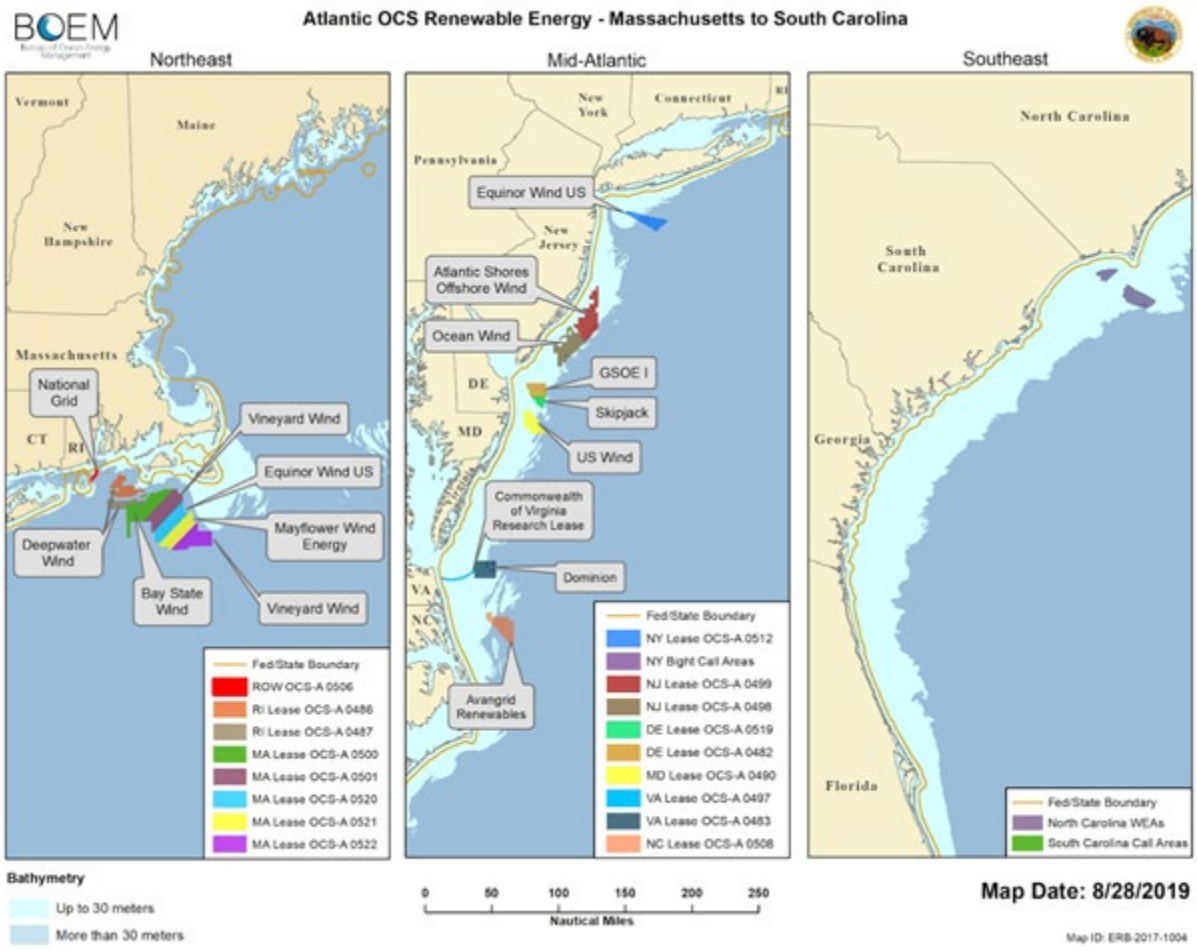
Map 12 – Sum of Sea Scallop FMP revenues (2012-2016) relative to wind energy planning areas, active lease areas, and FY2023 scallop rotational areas. Approximate revenues are based on VTR data.



Map 13 – Scallop survey and biomass estimation areas (SAMS) (left) and original scallop rotational areas established through Amendment 10 (2004) (right) relative to the Central Bight Call Areas announced in January 2022.



Map 14 – Map of BOEM Wind Planning areas, Wind Energy Areas, and Wind Leasing Areas on the Atlantic Outer Continental Shelf.



6.7.2.2.2 Global Climate Change

Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity and duration of extreme climate events; changing ocean chemistry; and warming ocean temperatures. The rates of physical and chemical changes in marine ecosystems have been most rapid in recent decades (Johnson et al. 2019). Emerging evidence demonstrates that these physical changes are resulting in direct and indirect ecological responses within marine ecosystems, which may alter the fundamental production characteristics of marine systems (Stenseth et al. 2002). The general trend of changes can be explained by warming causing increased ocean stratification, which reduces primary production, lowering energy supply for higher trophic levels and changing metabolic rates. Different responses to warming can lead to altered food-web structures and ecosystem-level changes. Shifts in spatial distribution are generally to higher latitudes (i.e., poleward) and to deeper waters as species seek cooler waters within their normal temperature preferences. Climate change will also potentially exacerbate the stresses imposed by fishing

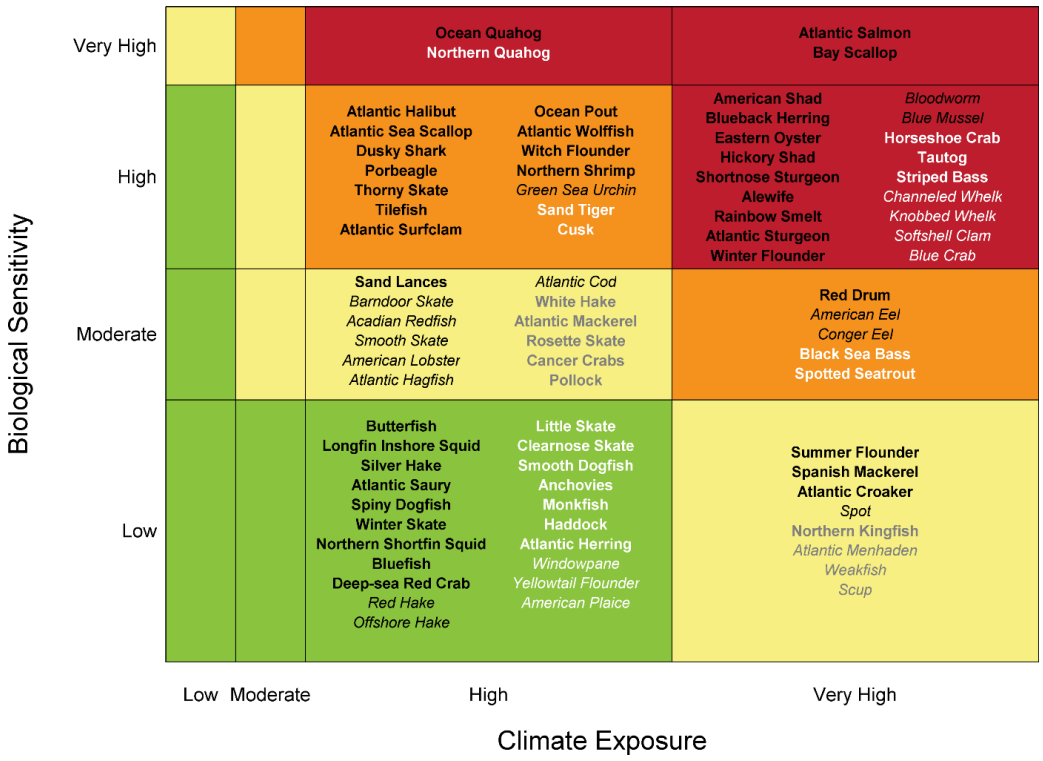
and other non-fishing human activities and stressors. Survival of marine resources under a changing climate depends on their ability to adapt to change, but also how and to what degree those other human activities influence their natural adaptive capacity.

Results from the Northeast Fisheries Climate Vulnerability Assessment indicate that climate change could have impacts on Council-managed species that range from negative to positive. With limited adaptability, Atlantic sea scallops are likely to be negatively impacted by the changing environment, particularly in the southern extent of their range (Hare et al. 2016).

Based on this assessment, Atlantic sea scallops were scored as having high climate vulnerability with very high certainty (Hare et al. 2016). Scallops and their larvae are vulnerable to the effects of ocean acidification in the coming decades, which may lead to a reduction in biomass and/or harvests. As an invertebrate with very low adult mobility, scallops are very vulnerable to climate change and increasing bottom temperatures. The range of the commercial fishery has contracted over the last decade due to a decline in commercial densities at the southern extent of the range. While there are several factors that may be driving this change in distribution, animals at the southern end of the range are most vulnerable to the impacts of climate change.

Overall vulnerability results for additional Greater Atlantic species, including most of the non-target species identified in this action, are shown in **Figure 31** (Hare et al. 2016). While the effects of climate change may benefit some habitats and the populations of species through increased availability of food and nutrients, reduced energetic costs, or decreased competition and predation, a shift in environmental conditions outside the normal range can result in negative impacts for those habitats and species unable to adapt. This, in turn, may lead to higher mortality, reduced growth, smaller size, and reduced reproduction or populations. Thus, already stressed populations are expected to be less resilient and more vulnerable to climate impacts. Climate change is expected to have impacts that range from positive to negative depending on the species. However, future mitigation and adaptation strategies to climate change may mitigate some of these impacts. The science of predicting, evaluating, monitoring, and categorizing these changes continues to evolve. The social and economic impacts of climate change will depend on stakeholder and community dependence on fisheries, and their capacity to adapt to change. Commercial and recreational fisheries may adapt in different ways, and methods of adaptation will differ among regions. In addition to added scientific uncertainty, climate change will introduce implementation uncertainty and other challenges to effective conservation and management.

Figure 31 – Overall climate vulnerability score for fish and invertebrates on the Northeast U.S. Continental Shelf (Hare et al. 2016). Effects are more certain for species shown in dark text.



6.7.3 Baseline Condition for the Resources, Ecosystems, and Human Communities

For the purposes of this CEA, the baseline condition is considered as the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions.

Table 91 summarizes the added effects of the condition of the VECs (i.e., status/trends/stresses from Affected environment and impacts) and the sum effect of the past, present, and reasonably foreseeable future actions (from previous summary table or Past, present, reasonably foreseeable future action section above). The resulting CEA baseline for each VEC is exhibited in the last column of **Table 91**. As mentioned above, the CEA baseline is then used to assess cumulative effects of the proposed management actions.

Table 91 – Summary of the current status; combined effects of Past, Present, and Reasonably foreseeable future actions; and the combined baseline condition of each VEC

VEC		Status/Trends	Combined Effects of Past, Present, and Reasonably Foreseeable Future Actions	Combined CEA Baseline Conditions
		A	B	A+B
Target species		Not overfished, not subject to overfishing, but probably that could change if recruitment does not improve.	**Positive** Stocks are being managed sustainably.	**Positive** Stocks are being managed sustainably and adjustments are being made to help prevent overfishing.
Non-target species	**GB Yellowtail flounder**	Overfished status unknown, overfishing trend unknown.	**Slight Positive** Gear modifications & time/area closures to reduce bycatch; reactive AMs in place; annual monitoring of scallop fishery catches.	**Mixed** Gear modifications & time/area closures to reduce bycatch; reactive AMs in place; non-target stocks remain in poor status.
	SNE yellowtail flounder	Overfished, not subject to overfishing.		
	GOM/GB Windowpane	Overfished status unknown, not subject to overfishing.		
	SNE/MA windowpane	Not overfished, not subject to overfishing.		
Protected resources	**Sea Turtles**	Endangered or threatened.	**Slight Positive** Continued use of gear modifications and effort controls along with past regulations will likely help stabilize protected species interactions at low levels.	**Mixed** Continued use of gear modifications and catch and effort controls are likely to reduce gear encounters through effort reductions.
	Atlantic Sturgeon	Endangered or threatened.		

Physical Environment and EFH	Fishing impacts are complex/variable and typically adverse; Non-fishing activities have had negative but site-specific habitat effects. Non-fishing activities have had historically negative but site-specific effects on habitat.	**Mixed** Continued management of physical environment and EFH for an increased quality of habitat. Fishing activities and non-fishing activities continue to reduce habitat quality.	**Mixed** Reduced habitat disturbance by fishing gear; impacts from non-fishing activities, could increase and have negative impact.
Human Communities (Economic Impacts and Social Impacts)	Fishery resources have been rebuilt to support profitable industries and communities.	**Positive** Continued fisheries management will likely control effort for a sustainable fishery and thus fishery and non-fishery related activities will continue.	**Positive** Sustainable resources should support viable communities and economies

6.7.4 Summary of Effects of the Proposed Actions

Framework 36 would set specifications and to adjust management measures for the Atlantic Sea Scallop fishery to achieve the objectives of the fishery management plan (FMP). The preferred alternatives in this action are summarized in Section 1.0 (Executive Summary). The impacts of the proposed actions are described in Section 6.0 and summarized in Table 92 below.

Table 92 – Summary of impacts for Valued Ecosystem Components (VECs) in Framework 36 (preferred alternatives in gray).							
Actions & Alternatives		**Options**	**Direct and indirect impacts**				
			Target Species	**Non-target Species**	**Protected Resources**	**Physical Env. (EFH)**	**Economic and Social Impacts**
Action 1: OFL and ABC	**Alt. 1 – No Action**		Low +	Negligible	Low -	Negligible	Economic: Neg. to L- Social: Moderate Negative
	Alt. 2 – Update OFL and ABC		Low +	Negligible	Low -	Negligible	Econ: Neg. to L+ Social: Slight Negative
Action 2: NGOM TAL Setting	**Alt. 1 – No Action**		Low –	Negligible	Low – to Negligible	Low -	Economic: Negative Social: Low -
	Alt. 2 – Set TAL	**Option 1 – F=0.15 Stellwagen Only**	Most Positive	Negligible	Low – to Negligible	Low -	Economic: ST—- Social: + to -
		Option 2—- F=0.18 Stellwagen Only	Positive	Negligible	Low – to Negligible	Low -	Economic: ST—- Social: + to -
		Option 3 – F=0.15 Stellwagen, Ipswich, Jeffreys	Positive	Negligible	Low – to Negligible	Low -	Economic: ST—- Social: + to—-
		Option 4 – F=0.18 Stellwagen, Ipswich, Jeffreys	Positive	Negligible	Low – to Negligible	Low -	Economic: ST—- Social: + to -
Action 3 – Specifications	**Alt. 1 – No Action**		Low – to Negligible	Low +	Low – to Negligible	Low -	Economic: Negative Social: Negative
	Alt. 2 –	**Option 1 – F=0.46 (22 DAS)**	Low +	Low – to Negligible	Low – to Negligible	Low -	Economic: Low -; ST least + Social: Positive
		Option 2 – F=0.51 (24 DAS)	Low + to Low -	Low – to Negligible	Low – to Negligible	Low -	Economic: Low—- Social: Positive
		Option 1 – F=0.46 (22 DAS)	Low +	Low – to Negligible	Low – to Negligible	Low -	Economic: Low—- Social: Positive

Table 92 – Summary of impacts for Valued Ecosystem Components (VECs) in Framework 36 (preferred alternatives in gray).							
Actions & Alternatives		**Options**	**Direct and indirect impacts**				
			Target Species	**Non-target Species**	**Protected Resources**	**Physical Env. (EFH)**	**Economic and Social Impacts**
	Alt. 3 –	**Option 2 – F=0.51 (24 DAS)**	Low + to Low -	Low – to Negligible	Low – to Negligible	Low -	Economic: Low—- Social: Positive
	Alt. 4 –	**Option 1 – F=0.46 (22 DAS)**	Low + to Low -	Low – to Negligible	Low – to Negligible	Low -	Economic: Low—- Social: Positive
		Option 2 – F=0.51 (24 DAS)	Low + to Low -	Low – to Negligible	Low – to Negligible	Low -	Economic: Low -; ST most + Social: Positive
Action 4 – LAGC IFQ access area allocations	**Alt. 1 – No Action**		Low –	Negligible	Low – to Slight +	Low -	Economic: Negative Social: Negative
	Alt. 2 – Update LAGC IFQ Access Area Trip Allocations, Distribute Area II Access Area Allocation to the Nantucket Lightship North and Area II		Low + to negligible	Negligible	Low – to Negligible	Low – to Negligible	Economic: Negligible to Slight + Social: Slight Positive

6.7.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative impacts of the preferred alternatives, the incremental impacts of the direct and indirect impacts should be considered, on a VEC-by-VEC basis, in addition to the effects of all actions (those identified and discussed relative to the past, present, and reasonably foreseeable future actions of both fishing and non-fishing actions). Table 92 provides a summary of likely impacts found in the various groups of management alternatives contained in this action. The CEA baseline that, as described above in Table 91 represents the sum of past, present, and reasonably foreseeable future actions and conditions of each VEC. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with "other" actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC. As seen above in Section 6.7.2.2, non-fishing impacts on the VECs generally range from no impact to slight negative.

6.7.5.1 Magnitude and Significance of Cumulative Effects on Target Species

Past fishery management actions taken through the Atlantic sea scallop fishery and the annual specifications process such as catch limits and allocations ensure that stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts of annual specification of management measures are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which the scallop rotational management program is effective. These actions have generally had a positive cumulative effect on the scallop stock. It is anticipated that the future management actions described in Section 6.7.2.1.1 will have additional indirect positive effects on the target species through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on which the productivity of the target species depends.

As noted previously in Section 6.2, none of the preferred alternatives are expected to result in significantly increased levels of fishing effort or changes to the character of that effort relative to current conditions. Therefore, impacts of the fisheries on target species are not expected to change relative to current conditions under the preferred alternatives (i.e., generally positive for target species). The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on target species by achieving the objectives specified in the FMP.

When the direct and indirect effects of the Framework 36 alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield non-significant slightly positive impacts on scallop resource.*

6.7.5.2 Magnitude and Significance of Cumulative Effects on Non-target Species

The combined impacts of past federal fishery management actions on non-target species have been mixed, as decreased effort and reduced catch of non-target species continue, though several stocks are in poor status. Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species. As noted in Section 6.7.2.1.1, the actions proposed by Framework 36 would likely continue this trend. Future actions are anticipated to continue rebuilding non-target species stocks and limit the take of incidental/bycatch in the Atlantic sea scallop fishery, particularly through mitigation measures such as time/area closures, sub-ACLs, AMs. The measures proposed in this action would likely have some impacts on non-target species, since fishing activity is expected to overlap with non-target species of interest, particularly on Georges Bank. However, continued management of directed stocks will also control catch of non-target species.

As noted previously in Section 6.3, none of the preferred alternatives are expected to result in significantly increased levels of fishing effort or changes to the character of that effort relative to current conditions. Therefore, impacts of the fishery on non-target species are not expected to change relative to the current condition under the preferred alternatives (i.e., slight positive for non-target species). The proposed actions in this document would positively reinforce past and anticipated cumulative effects on non-target species by achieving the objectives in the FMP.

When the direct and indirect effects of Framework 36 alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield non-significant slight negative to negligible impacts on non-target species.*

6.7.5.3 Magnitude and Significance of Cumulative Effects on Physical Environment

Past fishery management actions taken through the Habitat amendments, the Atlantic sea scallop FMP and annual specifications process have had negligible to slightly positive cumulative effects on habitat. The actions have constrained fishing effort both at a large scale and locally and have implemented gear requirements which may reduce impacts on habitat. As required under Omnibus Habitat Amendment 2, EFH and Habitat Areas of Particular Concern were designated for the managed resources. It is anticipated that the future management actions described in Section 6.7.2.1 will result in additional direct or indirect positive effects on habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends.

Many additional non-fishing activities, as described above in Section 6.7.2.2.1, are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. These impacts could be broad in scope. All the VECs are interrelated; therefore, the linkages among habitat quality, managed resources and non-target species productivity, and associated fishery yields should be considered. Some actions, such as coastal population growth and climate change may indirectly impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management. Reductions in overall fishing effort and protection of sensitive habitats have mitigated some negative effects.

As noted previously in Section 6.5, none of the preferred alternatives are expected to result in significantly increased levels of fishing effort or changes to the character of that effort relative to current conditions. Although the impacted areas have been fished for many years with many different gear types and therefore will not likely be further impacted by these measures, continued fishing effort will continue to impact habitats. Therefore, the impacts of the fishery on the physical environment are not expected to change relative to the current condition under the preferred alternatives (i.e., slight negative for physical environment).

When the direct and indirect effects of the Framework 36 alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield non-significant slight negative impacts on the physical environment and EFH.*

6.7.5.4 Magnitude and Significance of Cumulative Effects on Protected Species

Given their life history dynamics, large changes in protected species abundance over long time periods, and the multiple and wide-ranging fisheries management actions that have occurred, the cumulative impacts on protected species were evaluated over a long-time frame (i.e., from the early 1970s when the Marine Mammal Protection Act and Endangered Species Act were implemented through the present).

Numerous protected species (ESA listed and/or MMPA protected) occur in the Northwest Atlantic; however, as provided in Section 5.4, only ESA-listed species of sea turtles or Atlantic sturgeon may be impacted (i.e., bycaught) by the operation of the scallop fishery. Given this, this section will focus' its cumulative effects analysis on ESA listed species of sea turtles and Atlantic sturgeon; the cumulative effects to other protected species that may occur but are not likely to be impacted by the scallop fishery are expected to be negligible. The distribution and status of ESA-listed species of sea turtles or Atlantic sturgeon in the region are described in Section 5.4.

Taking into consideration the above information, past fishery management actions taken through the Atlantic sea scallop FMP and annual specifications process have had slight indirect positive cumulative effects on ESA-listed species of sea turtles and Atlantic sturgeon. The actions have constrained fishing effort both at a large scale and locally, and have implemented, pursuant to the ESA or MSA, gear modifications, requirements and management areas that have served to reduce interactions between protected species and fishing gear. It is anticipated that future management actions, as described in Section 6.7.2, will result in additional indirect positive effects on ESA-listed species of sea turtles and Atlantic sturgeon. These impacts could be broad in scope.

The preferred alternatives would not substantially modify current levels of fishing effort in terms of the overall amount of effort, timing, and location. They would allow existing fishing effort to continue. As described in Section 6.4, the proposed action is expected to have impacts on ESA-listed species of sea turtles and Atlantic sturgeon that range from slight negative to negligible, depending on the species.

When the direct and indirect effects of the Framework 36 alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield non-significant slight negative to negligible impacts.*

6.7.5.5 Magnitude and Significance of Cumulative Effects on Human Communities

Past fishery management actions taken through the respective FMPs and annual specifications process such as catch limits, and commercial allocations have had both positive and negative cumulative effects on human communities. They have benefitted domestic fisheries through sustainable fishery management but can also reduce participation in fisheries. The impacts from annual specification of management measures are largely dependent on how effective those measures are in meeting their intended objectives. The economic and social successes of the scallop fishery are linked to the success of the rotational management program, and availability of scallops on inshore and offshore fishing grounds.

It is anticipated that the future management actions described in Section 6.7.2.1.5 will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on some human communities could occur if management actions result in reduced revenues and fishing opportunities. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects. Despite the potential for negative short-term

effects on human communities due to reduced revenue, positive long-term effects are expected due to the long-term sustainability of the managed stocks.

By providing revenues and contributing to the overall functioning of and employment in coastal communities, the Atlantic sea scallop fishery has both direct and indirect positive social impacts. As previously described in Section 6.6.2, the preferred alternatives are unlikely to result in substantial changes to levels of fishing effort or the character of that effort relative to current conditions. Through implementation of this action, the Council seeks to achieve the primary objective of the MSA, which is to achieve OY from the managed fisheries.

When the direct and indirect effects of the Framework 36 alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects are expected to yield non-significant slight positive to positive impacts.*

6.7.6 Proposed Action on all the VECs

The Council's preferred alternatives (i.e., the proposed action) are described in Section 4.0. The direct and indirect impacts of the proposed action on the VECs are described in Section 6.0 and are summarized in the Executive Summary in Section 1.0. The magnitude and significance of the cumulative effects, including additive and synergistic effects of the proposed actions, as well as past, present, and future actions, have been taken into account (Section 6.7.4).

When considered in conjunction with all other pressures placed on the fisheries by past, present, and reasonably foreseeable future actions, the preferred alternatives are not expected to result in any significant impacts, positive or negative. The preferred action for setting the OFL/ABC is expected to have slightly positive impacts on the scallop resource in the long-term, negligible impacts on non-target species, slight negative impacts on protected resources, negligible impacts on the physical environment, and negligible to moderately negative impacts on human communities. The preferred alternative for setting the NGOM TAL is expected to have positive impacts on the scallop resource in the management unit, negligible impacts on non-target species, slight negative to negligible impacts on protected resources, slight negative impacts on the physical environment, slight negative economic impacts, and mixed impacts on human communities. For the 2023 and 2024 specifications, the preferred alternative is expected to have slightly positive to slightly negative impacts on the scallop resource, slight negative to negligible impacts on non-target species, slight negative to negligible impacts on protected resources, slight negative impacts on the physical environment, slight negative economic impacts and positive social impacts on human communities. For the LAGC IFQ access area trips, the preferred alternative is expected to have slightly positive to negligible impacts on the scallop resource, negligible impacts on non-target species, slight negative impacts to negligible impacts on protected resources, slight negative to negligible impacts on the physical environment, negligible to slight positive economic and slight positive social impacts on human communities.

The preferred alternatives are consistent with other management measures that have been implemented in the past for the Atlantic sea scallop fishery. These measures are part of a broader management scheme for scallop fishery. This management scheme has helped to rebuild stocks and ensure long-term sustainability, while minimizing environmental impacts.

The regulatory atmosphere within which federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of managed species, habitat, and human communities. Consistent with NEPA, the MSA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs from past, present and reasonably foreseeable future actions have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the

VECs are not experiencing negative impacts, but rather that when considered as a whole and as a result of the management measure implemented in these fisheries, the overall long-term trend is positive.

There are no significant cumulative effects associated with the preferred alternatives based on the information and analyses presented in this document and in past FMP documents (Table 93). Cumulatively, through 2028 it is anticipated that the preferred alternatives will result in non-significant impacts on all VECs, ranging from slight negative to positive.

Table 93 – Summary of Cumulative Effects of the Preferred Alternatives.

	Target Species	**Non-Target Species**	**Habitat**	**Protected Resources**	**Human Communities (Economic and Social Impacts)**
Direct/Indirect Impacts of Preferred Alternative	Slight positive	Slight negative to negligible	Slight negative	Slight negative to negligible	Slight positive to positive
Combined Cumulative Effects Assessment Baseline Conditions	Positive	Mixed	Mixed	Mixed	Positive
Cumulative Effects	Slight positive	Slight negative to negligible	Slight negative	Slight negative to Slight positive	Slight positive to positive.

7.0 APPLICABLE LAWS/EXECUTIVE ORDERS

7.1 MAGNUSON STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

7.1.1 National Standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that regulations implementing any fishery management plan or amendment be consistent with ten national standards. Below is a summary of how this action is consistent with the National Standards and other required provisions of the Magnuson-Stevens Act.

The Council continues to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that will continue to prevent overfishing, while achieving optimum yield for managed species and the U.S. fishing industry on a continuing basis. The primary goal of managing the scallop fishery is to maintain long-term sustainable catch levels and the first objective of the Scallop FMP is to prevent overfishing.

The Scallop FMP established a fishery specifications process that ensures a consistent review of the Atlantic sea scallop stock status, fishery performance, and other factors to manage by annual catch limits (ACL) and prevent overfishing. The measures implemented through this action should further achieve the goals/objectives and reduce the possibility of overfishing the Atlantic sea scallop resource. The Atlantic sea scallop resource is currently not overfished, and overfishing is not occurring (see Section 5.2).

This action is consistent with National Standard 2 because it was informed by fisheries-independent data from several surveys, commercial fishery landings data, stock assessments, and other scientific data sources. The 2023 and 2024 (default) scallop fishery specifications are supported by the best available scientific information, and recommendations for scallop fishery catch limits (i.e., OFL, ABC/ACL) are based on advice from the Council's Scientific and Statistical Committee (SSC). The supporting science and analyses, upon which the proposed action is based, are summarized and described in Section 5.0 and Section 6.0 of this document.

The Council manages Atlantic sea scallops throughout their range (National Standard 3). Under the Atlantic Sea Scallop FMP, the target fishing mortality rate and stock biomass are applied to the scallop resource from North Carolina to the US/Canada boundary. This encompasses the entire range of the Atlantic sea scallop stock under Federal jurisdiction. See Section 5.2 for a description of the scallop resource. Furthermore, the management measures proposed in this action do not discriminate among residents of different states (National Standard 4); the measures are intended to be applied equally to scallop permit holders of the same category, regardless of homeport of location.

The proposed 2023 and 2024 (default) scallop fishery specifications are allocated to management areas (i.e., open and access areas, the Northern Gulf of Maine) in a manner that is intended to maximize opportunities for the fishery while minimizing the potential for overfishing. The specifications proposed in this document should promote efficiency in the use of fishery resources through appropriate measures intended to provide access to the scallop fishery for both current and historical participants while minimize the race to fish in any of the scallop management areas, and they do not have economic allocation as their sole purpose (National Standard 5).

The measures proposed account for variations in the fishery (National Standard 6). The 2020 scallop assessment update noted declines in biomass and recruitment from previous assessments. There are several factors which could introduce variations into the scallop fishery, and this action enhances the ability of the Scallop FMP to adapt to changing resource conditions. The rotational management program is expected to allow the FMP to stabilize fishing effort in open areas and access areas, and potentially allow the FMP greater flexibility to achieve optimum yield through rotational area management in the future. Furthermore, market fluctuations, environmental factors, and predator-prey interactions constantly introduce additional variations among, and contingencies in, the scallop resource, the fishery, and the available catch. The proposed 2023 and 2024 (default) scallop fishery specifications represent reductions in projected landings from recent years. However, these specifications intend to balance the needs of the scallop fishery while accounting for the variation in scallop biomass and recruitment.

As always, the Council considered the costs and benefits associated with the proposed 2023 and 2024 (default) specifications and scallop fishery catch limits (i.e., OFL, ABC/ACL). Any costs incurred as a result of the management action proposed in this document are necessary to achieve the goals and objectives of the Scallop FMP and are viewed to be outweighed by the benefits of taking the management action. Consistent with National Standard 7, the management measures proposed in this document are not duplicative and were developed in close coordination with NMFS and other interested entities and agencies to minimize duplicity.

The proposed 2023 and 2024 (default) scallop fishery specifications consider the importance of fishery resources to fishing communities (National Standard 8). A complete description of the fishing communities participating in and dependent on the scallop fishery is in Section 5.6. Relative to the No Action alternatives, the measures proposed are expected to have positive impacts on communities engaged in and dependent on the scallop fishery.

This action also considers National Standard 9; Section 5.3 of this document has information related to bycatch in the scallop fishery. The primary non-target species in this fishery are GB yellowtail flounder, northern windowpane flounder, SNE/MA yellowtail flounder, and southern windowpane flounder, all of which have catch caps (i.e., sub-ACLs). The proposed 2023 and 2024 (default) specifications, as well as other proactive measures such as seasonal closures in rotational areas, gear requirements, and effort controls, promote the concept of reducing bycatch to the extent practicable. In general, area rotation promotes efficiency by increasing catch rates and reducing area swept, which reduces fishing time and reduces overall bycatch in the scallop fishery. If sub-ACLs for any of the above flounder stocks are exceeded, reactive accountability measures are implemented which require further modifications to dredge gear to reduce flatfish bycatch in the future.

Finally, this action is consistent with National Standard 10 to promote the safety of human life at sea. The Council has the utmost concern regarding safety and understands how important safety is when considering allocations for scallop fishery. The proposed 2023 and 2024 (default) scallop specifications ensure that access to the scallop fishery is provided for vessels of all sizes and gear types and this action does not propose any new measures that would change the findings from previous actions which discussed the effect of scallop management and the rotational management program on safety (Amendment 10 FSEIS).

7.1.2 Other Required Provisions of the M-S Act

(978) Section 303 of the Magnuson-Stevens Fishery Conservation and Management Act contains 14 additional required provisions for FMPs, which are discussed below. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, shall: *contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are— (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;*

Since the domestic scallop fishery is capable of catching and processing the allowable biological catch (ABC), there is no total allowable level of foreign fishing (TALFF), and foreign fishing on sea scallops is not permissible at this time.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

The fishery and fishery participants are described in detail in Section 5.6 of Amendment 21 to the Scallop FMP. Section 5.6 in this document describes the scallop permits by category as well as the active scallop vessels by permit type that could be affected by this action. The number of trips and average scallops landed per category are also included in that section.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from the fishery, and include a summary of the information utilized in making such specification;

The present and probable future condition of the resource and estimates of MSY and OY are given in Section 8.2.2.2 of Amendment 10 to the Scallop FMP.

The SSC reviewed the most recent work on assessing this resource and recommended that acceptable biological catch be set at 22,631 mt in 2023 and 23,289 mt in 2024 (default). 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.

This level was recommended by the Science and Statistical Committee (SSC) and various sources of scientific uncertainty were considered when setting this value. ABC calculations were based on the overfishing definition approved in Amendment 15, spatially averaged F = 0.61 as of the 2020 scallop assessment update. The control rule for target catches used for the limited access fishery in the Scallop FMP is that the spatially combined target fishing mortality must be no higher than that which gives a 25% probability of exceeding the ABC. This current estimate is a maximum of 0.39 for the limited access ACT in the Scallop FMP. Target fishing mortalities can be set below these limits but not above them. Under these principles, the probable future condition of this fishery is sustainable.

Current domestic landings and processing capabilities are around 50-60 million lb. Total landings have been above that level in some years since 2004 and are projected to be roughly 25 million pounds in fishing year 2023 under the proposed action (Section 4.3.3.2). However, the actual landings could be higher or lower than this amount depending on the availability of exploitable scallops in the open areas.

(4) assess and specify— (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

The US fishery is expected to harvest 100% of OY and domestic processors are expected to be able to process 100% of OY.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, charter fishing, and fish processing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, economic information necessary to meet the requirement and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

The FMP and existing regulations specify the type of reports and information that scallop vessel owners and scallop dealers must submit to NMFS. These data include, but are not limited to, the weight of target species and incidental catch which is landed, characteristics about the vessel and gear in use, the number of crew aboard the vessel, when and where the vessel fished, and other pertinent information about a scallop fishing trip. Dealers must report the weight of species landed by the vessel, the date of landing, and the ex-vessel price for each species and/or size grade. Important information about vessel characteristics, ownership, and location of operation is also required on scallop permit applications. Dealers are also surveyed for information about their processing capabilities.

All limited access scallop vessels and general category vessels are required to operate vessel monitoring system (VMS) equipment to record the location of the vessel for monitoring compliance with DAS regulations. An at-sea observer is also placed on scallop vessels at random to record more detailed information about the catch, including size frequency data, the quantity of discards by species, detailed gear data, and interactions with protected species.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

The action proposed in this framework does not alter any adjustments made in the Scallop FMP that address opportunities for vessels that would otherwise be prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fisheries. No consultation with the Coast Guard is required relative to this issue.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

Essential fish habitat (EFH) was defined in earlier scallop actions. This framework does not further address or modify those EFH definitions. There are no additional impacts to the physical environment or EFH expected from the action proposed in this framework.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

Data and research needs for the Atlantic sea scallop and its associated fisheries are described in Section 5.1.8 of Amendment 10 and Section 4.1 of Amendment 15. Other data already collected include fishery dependent data described in Section 6.2.4 of Amendment 10, Section 4.4 of Amendment 15, and Section 5.6 of Amendment 21. Fishery-independent resource surveys provide an index of scallop abundance and biomass on an annual basis.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on— (A) participants in the fisheries and fishing communities affected by the plan or amendment; (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants; and (C) the safety of human life at sea, including weather and to what extend such measures may affect the safety of participants in the fishery;

The impacts of the scallop management program in general have been analyzed in previous scallop actions (Amendment 10, Amendment 11, Amendment 15, Amendment 19, Amendment 21, Framework 16, and Frameworks 18—- 34). Any additional impacts from measures proposed in this action on fishery participants are summarized in Section 6.6.2. Safety in the scallop fishery was described in Section 8.1.5.6 of Amendment 10 and nothing proposed in this action is expected to affect safety of human life at sea.

10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

Overfishing reference points describing targets and thresholds for biomass and fishing mortality were updated in the most recent stock assessment (NEFSC 2020) and are presented and explained in Section 5.2 of this document.

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority— (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;

This action does not include changes to the current standardized bycatch reporting methodology (SBRM). This methodology is expected to assess the amount and type of bycatch in the scallop fishery and help identify ways the fishery can minimize bycatch and mortality of bycatch which cannot be avoided. The scallop fishery also has an industry funded observer set-aside program that provides additional funding (portion of total scallop catch set-aside) to put observers on scallop vessels.

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

The proposed action does not address recreational fishing regulations. There are no substantial recreational or charter fishing sections in the scallop fishery. Any recreational scallop fishing is likely conducted by diving, and harvest is by hand, meaning the survival of released scallops is maximized.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery, including its economic impact, and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;

A detailed description of the scallop fishery is included in Section 7.1 of Amendment 10, Section 4.4 in Amendment 11, Section 4.4 of Amendment 15, Section 5.6 of Amendment 21, and Section 5.6 of this action. These sections provide information relative to scallop vessels, processors, and dealers.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery; and

This action proposes slightly lower catch levels compared to the 2022 fishing year. The measures included in this action are expected to have positive economic impacts in the short-term (2022) compared to the No Action alternative, and slightly positive economic impacts in the short-term relative to the Status Quo scenario. The proposed measures are expected to have slightly positive economic impacts over the long-term (2021-2035) compared to the No Action and slightly negative economic impacts compared to Status Quo levels. The proposed specification measures will affect the vessels with limited access permits participating in the sea scallop fishery in similar proportions since each vessel within a permit category will receive the same number of open areas DAS and access area trip allocations, and the limited access general category IFQ vessels receive 5.5% of the total APL. As a result, the proposed specification measures will have proportionally similar impacts on revenues and profits of each vessel compared to No Action levels.

Section 6.6.1 provides a detailed examination of the expected economic impacts of this action. Harvest from the Atlantic sea scallop fishery will continue to be reviewed, established, and analyzed through the recurrent

framework process. Recreational fishing for sea scallops is rare and does not affect the overall FMP or participants in the federal fishery.

(15) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.

The proposed action includes catch limits for certain sectors of the scallop fishery, as well as effort controls for the rest of the fishery that is not under a direct TAC or quota. This action covers fishing years 2023 and 2024 (default) measures only. Measures have been set well below the fishing mortality threshold of 0.61, so overfishing is not expected to occur.

Amendment 15 was approved in 2011, which brought the Scallop FMP in compliance with new annual catch limits required under the reauthorized Magnuson-Stevens Act of 2007. The ABC was set in this action under the same principles and the respective values are: 22,631 mt in 2023 and 23,289 mt in 2024 (default). Fishery allocations under the proposed action are set at F = 0.24 overall. The annual projected landings from areas associated with that fishing mortality level is estimated to be around 25 million pounds in 2023.

7.2 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

The National Environmental Policy Act (NEPA) provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. The Council on Environmental Quality has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its policy and procedures for NEPA (NAO 216-6A).

7.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in the document as follows:

- The need for this action is described in Section 3.2;
- The alternatives that were considered are described in Section 4.0 (alternatives including the proposed action);
- The environmental impacts of the proposed action are described in Section 6.0, and;
- The agencies and persons consulted on this action are listed in Section 7.2.2 and Section 7.2.3.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An executive summary can be found in Section 1.0;
- A table of contents can be found in Section 2.0;
- Background and purpose are described in Section 3.0;
- A summary of the document can be found in the executive summary, Section 1.0;
- A brief description of the affected environment is in Section 5.0;
- Cumulative impacts of the proposed action are described in Section 6.7;
- A list of preparers is in Section 7.2.2.

7.2.2 List of Preparers; Point of Contact

Questions concerning this document should be addressed to:

Mr. Thomas A. Nies, Executive Director

New England Fishery Management Council

50 Water Street, Mill 2

Newburyport, MA 10950

(978) 465-0492

Additional copies of this EA can be requested via the above contact or through the Council's website at http://www.nefmc.org/scallops/index.html

Framework Adjustment 36 was prepared and evaluated in consultation with the National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council. Members of the Scallop PDT prepared and reviewed portions of analyses and provided technical advice during the development of the Environmental Assessment. The list of Scallop PDT members is included below:

Scallop Plan Development Team	
Jonathon Peros, PDT Chair, NEFMC	Jessica Blaylock, NEFSC, Observer Program
Amber Lisi, ME DMR	Kelly Whitmore, MA DMF
Dr. William DuPaul, College William & Mary	Danielle Palmer, GARFO, PRD
Travis Ford, GARFO, SFD	Sam Asci, NEFMC
Benjamin Galuardi, GARFO APSD	Dr. David Rudders, VIMS
Dr. Naresh Pradhan, NEFMC	Sharon Benjamin, GARFO, NEPA
Dr. Dvora Hart, NEFSC, Population Dynamics	Chris Parkins, RI DEM
Dr. Rachel Feeney, NEFMC	Dr. Adam Delargy, SMAST UMass Dartmouth
Carl Wilson, ME DMR	

In addition, other individuals contributed data and technical analyses for the document. Dr. Jui-Han Chen (NEFSC), Dr. Liese Siemann (Coonamessett Farm Foundation), Sally Roman (Virginia Institute of Marine Science), Dr. Jamie Cournane (NEFMC), Michelle Bachman (NEFMC), and Sherie Goutier from NEFMC staff assisted with various sections of this document.

7.2.3 Agencies Consulted

The following agencies were consulted in the preparation of this document:

New England Fishery Management Council

Mid-Atlantic Fishery Management Council

National Marine Fisheries Service, NOAA, Department of Commerce

7.2.4 Opportunities for Public Comment

The proposed action was developed during the period of May 2022 through December 2022 and was discussed at the meetings listed in Table 94, below. Opportunities for public comment were provided at each of these meetings.

Table 94 – Summary of meetings with the opportunity for public comment during the development of Framework 34.

Meeting	Location	Date
Scallop PDT	Webinar	5/24/2022
Scallop PDT	Webinar	5/31/2022
Scallop Advisory Panel	Webinar	6/14/2022
Scallop Committee	Webinar	6/15/2022
NEFMC Council Meeting	Portland, ME	6/30/2022
Scallop PDT	Webinar	8/10/2022
Scallop PDT	Falmouth, MA	8/31/2022
Scallop PDT	Falmouth, MA	9/1/2022
Scallop PDT	Webinar	9/7/2022
Scallop PDT	Webinar	9/13/2022
Scallop Advisory Panel	Boston, MA	9/20/2022
Scallop Committee	Boston, MA	9/21/2022
NEFMC Council Meeting	Gloucester, MA	9/27/2022
Scallop PDT	Webinar	10/3/2022
Scallop PDT	Webinar	10/13/2022
Scallop PDT	Webinar	10/19/2022
Scallop Advisory Panel	Providence, RI	10/26/2022
Scallop Committee	Providence, RI	10/27/2022
Scallop PDT	Webinar	11/7/2022
Scallop PDT	Webinar	11/16/2022
Scallop PDT	Webinar	11/18/2022
Scallop PDT	Webinar	11/29/2022
Scallop Advisory Panel	Webinar	12/1/2022
Scallop Committee	Webinar	12/1/2022
NEFMC Council Meeting	Providence, RI	12/7/2022

7.3 Marine Mammal Protection Act

Section 5.4 describes marine mammals that are found in the affected environment of the scallop fishery; however, despite the overlap of some marine mammal stocks and where the fishery is expected to operate, it has been

determined that this action is not likely to impact any species of marine mammals 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.

Given the above, the Council has concluded that the management actions proposed are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management area of the subject fishery. A final determination of consistency with the MMPA will be made by the agency when Framework 36 is implemented.

7.4 Endangered Species Act

NOAA's National Marine Fisheries Service (NMFS) issued a Biological Opinion (Opinion) on June 17, 2021, that considered the effects of the NMFS' authorization of the Scallop Fishery Management Plan (FMP) on ESA-listed species and designated critical habitat. The 2021 Opinion concluded that the scallop fishery, as authorized under the scallop FMP: 1) 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; and, 2) is not likely to adversely affect designated critical habitat for North Atlantic right whales or loggerhead (Northwest Atlantic Ocean DPS) sea turtles. 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.

The proposed action is not expected to alter overall fishing operations, lead to a substantial increase of fishing effort, or alter the spatial and(or) temporal distribution of current fishing effort in a manner that would increase interaction risks with ESA-listed species or cause adverse effects to critical habitat. Based on this, it has been determined that fishing activities pursuant to this action will not affect endangered and threatened species or critical habitat in any manner not considered in the 2021 Opinion on this fishery.

7.5 Administrative Procedures Act

Sections 551-553 of the Administrative Procedure Act established procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process, and to give public notice and opportunity for comment. The Council did not request relief from notice and comment rule making for this action, and the Council expects that NOAA Fisheries will publish proposed and final rule making for this action.

The Council has held 25 meetings open to the public on Framework 36 (Table 94). The Council initiated this action at the June 2022 Council meeting and approved final measures at the December 2022 meeting. After submission to NMFS, there will be an opportunity for public comment during the rulemaking process.

7.6 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. It also ensures that the Government is not overly burdening the public with requests for information. The amount that the proposed action would alter the burden hour estimates will be described and evaluated in an updated PRA analysis and public comments will be sought through Framework 36 rulemaking.

7.7 COASTAL ZONE MANAGEMENT ACT

Section 307 of the Coastal Zone Management Act (CZMA) is known as the federal consistency provision. Federal Consistency review requires that "federal actions, occurring inside or outside of a state's coastal zone, that have a reasonable potential to affect the coastal resources or uses of that state's coastal zone, to be consistent with that state's enforceable coastal policies, to the maximum extent practicable." The Council previously made determinations that the FMP was consistent with each state's coastal zone management plan and policies, and each coastal state concurred in these consistency determinations (in Scallop FMP). Since the proposed action does not propose any substantive changes from the FMP, the Council has determined that this action is consistent with the coastal zone management plan and policies of the coastal states in this region. Once the Council has adopted final measures and submitted Framework 36 to NMFS, NMFS will request consistency reviews by CZM state agencies directly.

7.8 INFORMATION QUALITY ACT (IQA)

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity and objectivity. This section provides information required to address these requirements.

Utility of Information Product

The proposed document includes a description of the management issues, a description of the alternatives considered, and the reasons for selecting the preferred management measures, to the extent that this has been done. These actions propose modifications to the existing FMP. These proposed modifications implement the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as well as all other existing applicable laws.

Utility means that disseminated information is useful to its intended users. "Useful" means that the content of the information is helpful, beneficial, or serviceable to its intended users, or that the information supports the usefulness of other disseminated information by making it more accessible or easier to read, see, understand, obtain or use. The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. The intended users of the information contained in this document are participants in the Atlantic sea scallop fishery and other interested parties and members of the public. The information contained in this document may be useful to owners of vessels holding a Atlantic sea scallop permit as well as scallop dealers and processors since it serves to notify these individuals of any potential changes to management measures for the fishery. This information will enable these individuals to adjust their fishing practices and make appropriate business decisions based on the new management measures and corresponding regulations.

The information being provided in this action is based on landings and effort information through the 2021 and 2022 fishing years when possible. Information presented in this document is intended to support Framework 36 and the proposed specifications for the 2023-2024 fishing years, which have been developed through a multi-

stage process involving all interested members of the public. Consequently, the information pertaining to management measures contained in this document has been improved based on comments from the public, fishing industry, members of the Council, and NOAA Fisheries.

This document is the principal means by which the information herein is publicly available. The information provided in this document is based on the most recent available information from the relevant data sources, including detailed and relatively recent information on the scallop resource and, therefore, represents an improvement over previously available information. This document will be subject to public comment through the rulemaking process, as required under the Administrative Procedure Act and, therefore, may be improved based on comments received.

This document is available in several formats, including printed publication, and online through the NEFMC's web page (www.nefmc.org). The Federal Register notice that announces the final rule and implementing regulations will be made available in printed publication, on the website for the Greater Atlantic Regional Fisheries Office (www.greateratlantic.fisheries.noaa.gov), and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

Integrity of Information Product

Integrity refers to security – the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity of Information Product

Objective information is presented in an accurate, clear, complete, and unbiased manner, and in proper context. The substance of the information is accurate, reliable, and unbiased; in the scientific, financial, or statistical context, original and supporting data are generated and the analytical results are developed using sound, commonly accepted scientific and research methods. "Accurate" means that information is within an acceptable degree of imprecision or error appropriate to the kind of information at issue and otherwise meets commonly accepted scientific, financial, and statistical standards.

For the Pre-Dissemination Review, this document is considered a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the MSA; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing NEPA. This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Several data sources were used in the development of this action, including, but not limited to, historical and current landings data from the Commercial Dealer and DMIS databases, vessel trip report (VTR) data, vessel monitoring system (VMS) data, and fisheries independent data collected through the NMFS bottom trawl surveys. The analyses herein were prepared using data from accepted sources and have been reviewed by members of the Scallop Plan Development Team and by the SSC where appropriate.

The conservation and management measures considered for this action were selected based upon the best scientific information available. The analyses important to this decision used information from the most recent

complete fishing years, generally through fishing year 2021. The data used in the analyses provide the best available information on the number of permits, both active and inactive, in the fishery, the catch (including landings and discards) by those vessels, the landings per unit of effort (LPUE), and the revenue produced by the sale of those landings to dealers, as well as data about catch, bycatch, gear, and fishing effort from a subset of trips sampled at sea by government observers.

Specialists, including professional members of plan development teams, technical teams, committees, and Council staff, who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the Atlantic sea scallop fishery. The proposed action is supported by the best available scientific information. The policy choice is clearly articulated in Section 4.0, the management alternatives considered in this action.

The supporting science and analyses, upon which the policy choice was based, are summarized and described in Section 5.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency. The review process used in preparation of this document involves the responsible Council, the NEFSC, GARFO, and NOAA Fisheries Service Headquarters. The NEFSC's technical review is conducted by senior-level scientists specializing in population dynamics, stock assessment, population biology, and social science.

The Council review process involves public meetings at which affected stakeholders have the opportunity to comment on the document. Review by staff at GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. The Council also uses its Scientific and Statistical Committee to review the background science and assessment to approve the Allocable Biological Catch (ABCs), including the effects those limits would have on other specifications in this document. The SSC is the primary scientific and technical advisory body to the Council and is made up of scientists that are independent of the Council. A list of current committee members can be found at: https://www.nefmc.org/committees/scientific-and-statistical-committee.

Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. In preparing this action for the Atlantic Sea Scallop FMP, the Council and NMFS took into account the policies of the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Information Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas). The Council has determined that the proposed action is consistent with the National Standards of the MSA and all other applicable laws.

7.9 EXECUTIVE ORDER 13158 (MARINE PROTECTED AREA)

Executive Order (EO) 13158 on Marine Protected Areas (MPAs) requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The EO directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the EO. The EO requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. A list of MPA sites has been developed and is available at: http://marineprotectedareas.noaa.gov/nationalsystem/nationalsystemlist/. No further guidance related to this EO is available at this time.

In the Northeast U.S., the only MPAs are the Stellwagen Bank National Marine Sanctuary (SBNMS), the Tilefish Gear Restricted Areas in the canyons of Georges Bank, and the National Estuarine Research Reserves and other coastal sites. The only MPA that overlaps the Atlantic sea scallop fishery footprint is the SBNMS.

This action is not expected to more than minimally affect the biological/habitat resources of the SBNMS MPA, which was comprehensively analyzed in the Omnibus Habitat Amendment 2 (NEFMC 2016). Fishing gears regulated by the Atlantic sea scallop FMP are unlikely to damage shipwrecks and other cultural artifacts because fishing vessel operators actively avoid contact with cultural resources on the seafloor to minimize costly gear losses and interruptions to fishing.

In fishing year 2017 there were unintended interactions and damage to a shipwreck in the Stellwagen Bank National Marine Sanctuary (SBNMS), likely caused by limited access vessels that were operating under DAS management in the NGOM management area and were not familiar with the location of the wrecks. In preparation for both the 2018 and 2019 Northern Gulf of Maine (NGOM) scallop fishery, NOAA Fisheries, in conjunction with NOAA Stellwagen Bank National Marine Sanctuary (Sanctuary), published a bulletin requesting that scallopers avoid shipwreck sites in the Sanctuary by keeping gear 360 feet away from each of the site locations listed in the bulletin. A chart was provided to show the area where these shipwrecks are located. Measures were implemented for fishing year 2018 and 2019 to limit effort in the NGOM, and no interactions with shipwrecks were reported. The portion of Stellwagen Bank within the NGOM Management Area was closed in fishing years 2020 and 2021 to protect a large recruitment event, reopened the Stellwagen Bank closure for the duration of fishing year 2022 and will remain open for the duration of 2023 under the proposed action. Fishing in the NGOM management area is expected to occur on Stellwagen Bank, Jeffreys Ledge, and Ipswich Bay, based on observed scallop biomass in the 2022 surveys and fishing behavior/fishing reports from the 2022 NGOM fishing season. While it is anticipated that scallop vessels will be operating in the vicinity of shipwrecks on Stellwagen Bank in fishing year 2023, proactive avoidance measures (i.e., notice of the location of shipwrecks to fishermen) have been taken to reduce the risk of adverse effects to these historic resources. Vessels fishing in the area will have access to information about the location of shipwrecks that will help to inform how to avoid them.

7.10 Executive Order 13132 (Federalism)

The E.O. on federalism establishes nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. Previous scallop actions have already described how the management plan is in compliance with this order. Furthermore, this action does not contain policies with Federalism implications, thus preparation of an assessment under E.O. 13132 is not warranted. The affected states have been closely involved in the development of the proposed action through their representation on the Council (i.e., all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

7.11 Executive Order 12898 (Environmental Justice)

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process (EO 12898 1994). NOAA guidance NAO 216-6A, Companion Manual, Section 10(A) requires the consideration of EO 12898 in NEPA documents. Agencies should also encourage public participation, especially by affected communities, during scoping, as part of a broader strategy to address environmental justice issues. Minority and low-income individuals or populations must not be excluded from participation in, denied the benefits of, or subjected to discrimination because of their race, color, or national origin.

Although the impacts of this action may affect communities with environmental justice concerns, the proposed actions should not have disproportionately high effects on low income or minority populations. The proposed actions would apply to all participants in the affected area, regardless of minority status or income level. The existing demographic data on participants in the Atlantic sea scallop fishery (i.e., vessel owners, crew, dealers, processors, employees of supporting industries) do not allow identification of those who live below the poverty level or are racial or ethnic minorities. Thus, it is impossible to fully determine how the actions within this specification document may impact these population segments. The public comment process is an opportunity to identify issues that may be related to environmental justice, but none have been raised relative to this action. The public has never requested translations of documents pertinent to the Atlantic sea scallop fishery.

For primary port communities relevant to this action (Section 5.6.3), poverty and minority rate data (for 2010) at the state and county levels are in Table 95. Minority rates are well below the state averages, except Hampton and Newport News, Virginia. Poverty rates are below or within 3% of state averages.

With respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and(or) wildlife for subsistence. GARFO tracks these issues, but there are no federally recognized tribal agreements for subsistence fishing in New England federal waters.

Table 95 – Demographic Data for Atlantic Sea Scallop Fishing Communities (counties).

State/County	Minority Rate[a]	Poverty Rate[b]
Massachusetts	*23.6%*	*10.5%*
Barnstable	7.5%	7.5%
Bristol	13.6%	11.3%
Rhode Island	*22.6%*	*12.2%*
Washington	7.4%	7.4%
Connecticut	*27.6%*	*10.1%*
New London	20.6%	7.2%
New Jersey	*39.4%*	*9.1%*
Cape May	12.5%	9.2%
Ocean	13.4%	9.0%
Virginia	*34.3%*	*10.3%*
Hampton[c]	57.8%	12.6%
Newport News[c]	53.0%	13.5%
York	24.9%	3.9%

Source: U.S. Census Bureau, 2010: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml
[a] Persons other than those who report as White persons not Hispanic or Latino.
[b] Persons below poverty level, 2006-2010.
[c] An independent city.

7.12 EXECUTIVE ORDER 12866 (REGULATORY IMPACT REVIEW)

7.12.1 Introduction

The Regulatory Impact Review (RIR) provides an assessment of the costs and benefits of preferred alternatives and other alternatives in accordance with the guidelines established by Executive Order 12866. The regulatory philosophy of Executive Order 12866 stresses that in deciding whether and how to regulate agencies should assess all costs and benefits of all regulatory alternatives and choose those approaches that maximize the net benefits to society.

The RIR also serves as a basis for determining whether any proposed regulations are a "significant regulatory action" under the criteria provided in Executive Order 12866 and whether the proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act of 2180 (RFA).

The Framework 36 document contains all the elements of the RIR/RFA, and the relevant sections are identified by reference to the document. The economic impacts of this action are summarized in Section 6.6.1 of this document.

7.12.2 Statement of Problems/Goals and Objectives

The purpose of and the need for action are described in Section 3.2.

7.12.3 Management Alternatives and Rationale

The alternatives under consideration in the Framework are explained in Section 4.0.

7.12.4 Description of the Fishery

A description of the fishery is available in Section 5.0.

7.12.5 Summary of Economic Impacts

Section 6.6.1 evaluated economic impacts of Framework 36 proposed measures and alternatives considered by the Council. The combined impacts of the specification alternatives on scallop fishery, on consumers and total economic benefits to the nation are analyzed in Section 6.6.1.3 and subsections from Section 6.6.1.3.1 to Section 6.6.1.3.10. The economic impacts of the individual measures are discussed in Sections as indicated below.

Section 6.6.1.1 Overfishing Limit and Acceptable Biological Catch

Section 6.6.1.2 Northern Gulf of Maine Management Area

Section 6.6.1.3 Economic impacts of the Framework 36 specification alternatives

Section 6.6.1.3.5 Summary of Short- and Long-Term Impacts

Section 6.6.1.3.6 LAGC IFQ Allocations

Section 6.6.1.3.7 Landings and Size Composition

Section 6.6.1.3.8 Prices and Revenue

Section 6.6.1.3.9 Impacts on DAS and Employment

Section 6.6.1.3.10 Producer Surplus, Consumer Surplus, and Total Economic Benefits

Section 6.6.1.4 Access Area Trip Allocations to the LAGC IFQ Component

The values for economic impacts are presented in terms of 2001 dollars in Section 7.12 and for the determination of the significant impacts, cumulative present value of the net economic benefits to the nation are also estimated in terms of 2001 dollars consistent with the guidelines in Circular A-4 (2003)[28]. The results of the economic impacts in 2001 dollars were summarized in Table 101, Table 102, Table 103. The economic impacts are also provided in current dollars (in 2022 dollars)(Table 100).

7.12.5.1 Baseline for determination of significant impacts

Framework 36 is a one-year action that will be implemented for the FY2023 fishing year. It also includes default measures for FY2024 in case the next scallop framework action is delayed. This evaluation of the economic impacts of the proposed action compares projections for the current fishing year (FY2022) to the economic projections for scenarios that were for the upcoming fishing year in Framework 36 (FY2023). For the E.O. 12866 analysis, the economic impacts of the proposed measures are estimated relative to the management framework that was implemented for fishing year FY2022 (i.e., FW34 preferred alternative) only. For FY2023, this analysis assumes that FT LA vessels would be allowed 24 open DAS and allocated two trips in the CAII (12,000 pounds/trip).

The FW34 preferred alternative projection for FY 2022 is used to evaluate whether the action will have a significant economic impact on the economy under the requirements of E.O. 12866. Specification alternatives under considerations in FW36 are presented in Table 96.

Table 96 – Specification and Rotational Management alternatives under consideration in FW 36.

FW36 Specification Alternatives/ Options	FW36 Sections	Description	Overall F rate	Open area F	FT DAS
Alternative 1	4.3.1	No Action	0.18	0.34	18
Alternative 2 Option 1	4.3.2.1	22DAS, 10,000 lbs./2 trips in CAII	0.22	0.46	22
Alternative 2 Option 2	4.3.2.2	24DAS, 10,000 lbs. /2 trips in CAII	0.23	0.51	24
Alternative 3 Option 1	4.3.3.1	22DAS, 12,000 lbs. /2 trips in CAII	0.23	0.46	22
Alternative 3 Option 2	4.3.3.2 (Preferred)	24DAS, 12,000 lbs. /2 trips in CAII	0.24	0.51	24
Alternative 4 Option 1	4.3.4.1	22DAS, 14,000 lbs. /2 trips in CAII	0.25	0.46	22
Alternative 4 Option 2	4.3.4.2	24DAS, 14,000 lbs. /2 trips in CAII	0.26	0.51	24
Status Quo	4.3.5	Status Quo	0.3	0.39	22.7

The Council and NOAA Fisheries have successfully used a hybrid system of DAS and rotational closures in the management of Atlantic sea scallops. This approach can result in increases and decreases in landings over time,

[28] Page 32 of Circular A-4 (2003) states that: "In presenting the stream of benefits and costs, it is important to measure them in constant dollars to avoid the misleading effects of inflation in your estimates", and page 45 states that: "Please report all monetized effects in 2001 dollars. You should convert dollars expressed in different years to 2001 dollars using the GDP deflator".

depending on which rotational areas may be open for harvest or closed to protect small scallops and improve yield-per-recruit. Considering that rotational closures and rotational harvest are driven by underlying resource conditions (i.e., level of exploitable biomass), a major driver of scallop fishery allocations is recruitment. While recruitment has been unremarkable prior to 2022, two exceptional year classes (2012 & 2013) supported landings of over 60 million pounds in 2019, with most of this harvest attributed to rotational areas. Considering the lack of incoming recruitment since 2012 and 2013 and that these year classes were harvested by the fishery over several years, overall landings, and subsequent economic benefits are expected to decline in FY2023 as well (Table 97).

Table 97 - Projected and actual scallop landings during FY2011-FY2023 (negative values in red).

Frameworks and Fish Year	Total Landings (lbs.)	**Projected Landings (lbs.)	n^{th} Framework's Status Quo (lbs.)	Differences in Actual vs. Projected Landings (lbs.)	% Differences in Actual vs Projected Landings*	Difference on Projected landings (lbs.) from Lag Year	% Difference on Projection from Lag Year
FW22 2011	58,461,465	52,300,000	57,000,000	6,161,465	11.78%	N/A	N/A
FW23 2012	57,098,684	57,200,000	§§59,800,000	-101,316	-0.18%	4,900,000	9.37%
FW24 2013	39,807,589	38,216,741	50,900,000	1,590,848	4.16%	-18,983,259	-33.19%
FW25 2014	32,020,980	38,463,656	31,700,000	-6,442,676	-16.75%	246,915	0.65%
FW26 2015	36,974,195	47,400,000	37,500,000	-10,425,805	-22.00%	8,936,344	23.23%
FW27 2016	42,423,177	46,932,006	44,800,000	-4,508,829	-9.61%	-467,994	-0.99%
FW28 2017	51,325,269	45,230,038	47,700,000	6,095,231	13.48%	-1,701,968	-3.63%
FW29 2018	58,100,342	57,748,612	44,000,000	351,730	0.61%	12,518,574	27.68%
FW30 2019	60,244,657	62,525,276	63,000,000	-2,280,619	-3.78%	4,776,664	8.27%
FW32 2020	45,585,081	51,604,456	44,900,000	-6,019,384	-11.66%	-10,920,820	-17.47%
FW33 2021	42,249,972	40,044,765	39,129,847	2,205,207	2.49%	-11,559,691	-28.87%
FW34 2022	§ 23,162,570	34,039,373	33,686,634	N/A	N/A	-6,005,392	-14.98%
FW36 2023	N/A	25,007,005	28,300,706	N/A	N/A	-9,032,368	-26.53%

Source: year-end catch reports (up to FW33), updated in September, 2022.

§total sea scallop landing as of Dec. 1, 2022 (ACL_tables.knit (noaa.gov)).

* negative sign indicates a lower value of actual or projected landing against a comparison parameter.

**for the preferred alternative in the corresponding fishing year.

§§ The status quo projection from earlier framework.

7.12.5.1.1 Summary of the economic impacts of the proposed measures

Economic impacts of the proposed measures on specification alternatives in Framework 36 are evaluated relative to the economic impacts of Framework 34's preferred alternative (FY2022). The economic assessments are in terms of the differences in landings, revenues, producer surplus and total economic benefits between the two frameworks over the short-run and long-run.

Short-run impacts:

- An economic assessment and comparison are made on the preferred alternatives for FY2023 (FW36) with the FY2022 (FW34). The summary of preferred alternative comparison between two frameworks in the short-term are shown in Table 98 and Table 99. Table 100 and Table 101 compare economic

values for all alternatives in FW36 with the Framework 34's preferred alternative (baseline) in the short-term.

- In the short run, the aggregate economic impact of the preferred alternative in FY2023 (FW36) is expected to be negative compared to the preferred alternative in FY2022 (FW34) primarily due to a drop in annual projected scallop landings to about 25.01 million pounds in FY2023 from 34.04 million pounds in FY2022. Hence, scallop revenue, producer surplus and total economic benefits (in 2001 dollars) for the preferred alternative (Section 4.3.3.2) in FY2023 (FW 36) are expected to decline by $47.97 million, $50.35 million and $46.98 million, respectively, compared to the preferred alternative projections for FY2022 (FW34) (Table 101).
- The short-term economic impacts evaluated in current dollars (2022 dollars) will also be lower. Scallop revenue, producer surplus and total economic benefits (in 2022 dollars) for the preferred alternative (Alternative 3 Option 2) in Section 4.3.3.2) in FY2023 (FW 36) are expected to decline by $74.71 million, $78.41 million and $73.16 million, respectively, compared to the preferred alternative projections for FY2022 (FW34) (Table 100).
- The economic impacts for the other non-preferred alternatives in FY2023 (FW36) are also lower when compared to the preferred alternative in FY2022 (Framework 34) (Table 100).
- While the projected landings in recent years have been lower to the estimates from earlier fishing years since 2011, wider swings in projected landings year-over-year can be expected occasionally due to the nature of stock recruitment and other environmental conditions. Scallop landing projections have ranged between 25 and 63 million pounds over the past 13-year period from FY2011 to FY2023. During this period, projected landings increased by about 23% in FY2015 and 28% in FY2018 compared to their previous year, but the projections also dropped with a similar magnitude in FY2013 and FY2021 by about 33% and 29% from their lag years, respectively (Table 97). In FW34, projected landings declined by about 15%. In FW36, it further declined by about 26.5% relative to FW34 projected landings. The magnitude of year-over-year variations in projected landings and associated risks are, however, expected by stakeholders due to substantial information on overall abundance, biomass, recruitment, growth that is gathered during annual surveys.
- The short-term level of employment in the scallop fishery as measured by CREW*DAS will be lower for the preferred alternative in FW36 in FY2023 compared to FY 2022 (FW34). There will be about 81,102 crew DAS in FW36 compared to 96,036 crew DAS in FW34. The decline in labor time is primarily attributed to reduced projected landings. Employment will be lower by about 16 % in FY2023 for the preferred alternative compared to levels estimated for FY 2022 in FW34.

Long-run impacts:

- In the long-run, cumulative present value (PV) of the economic benefits of the preferred alternative in FW36 (FY2023-FY2037) are higher compared to the preferred alternative in FW34 (FY2022-FY2036) (Table 102 and Table 103). The annualized increase in total economic benefits for the preferred alternative in FW36 over the long-term (over a period of next 15 years) compared to the preferred alternative in FW34 are $68.93 million and $75.39 million using a discount rate of 7% and 3%, respectively (Table 102 and Table 103, in 2001 dollars).[29]

[29] Annualized value of changes in cumulative present value of total economic benefit compared to previous framework's evaluated at 7% and 3%.,

i.e., Annualized value = PMT (r, N, ΔCPV$).

- The economic impacts in the long-run for the other four non-preferred alternatives in FW36 (FY2023-2037) are also higher compared to the preferred alternative in FW34 (FY2022-FY2036) at both discount rates of 7% and 3% (Table 102 and Table 103).
- The long-term level of employment in the scallop fishery as measured by CREW*DAS is expected to be higher for the preferred alternative in FY36 compared to FW34. There will be about 2,217,237 cumulative crew DAS in FY36 compared to 2,079,753 cumulative crew DAS in FW34 over the period of 15 years of projections. Long-term employment is expected to be slightly higher by about 6.23% for the preferred alternative in FW36 compared to FW34.

Summary of Economic Impacts for Other FW36 Actions:

On NGOM measures in Action 2:

- The measures for the NGOM scallop fishery considered in this action are described in detail in Section 4.2 of Framework 36. Economic impacts of the NGOM alternatives are analyzed in Section 6.6.1.2 of the Framework documents.
- The preferred alternative (Alternative 2 Option 3) would allow a lower amount scallop landing (TAL 434,311 lbs.) to occur in the NGOM area relative to "No Action' (Alternative 1, NGOM set-aside 448,062 lbs.). The NGOM Alternative 2 Option 3 (preferred) in FW36 yields lower net revenue estimated at $5.91 million in FY2023. The net benefit (net of No Action) for this option is estimated to be $0.707 million lower than Alternative 1 (No Action in FW36) resulting in a negative economic impact on the profits of NGOM LAGC entities. The preferred NGOM Set-Aside also represents a decrease from FY 2022 levels.
- The Council also recommended fishing year 2024 default measures would be set at 75% of the 2022 NGOM Set-Aside value.

On LAGC IFQ Access Area Trip Allocations in Action 4:

- Allocating 5.5% of the total allocations to LAGC vessels could result in a maximum of 571 trips (at 800-pound trip limit) under the FW36 preferred alternative, would have positive economic impacts compared No Action (Section 4.3.1) which only provides a maximum of 357 trips as a default measure in FY2023.
- Within Action 4, the Council specified where the LAGC could fish access area trips. Alternative 2 could have positive economic impacts on LAGC IFQ vessels overall compared to Alternative 1 (No Action or FW34 default). This alternative will make the total LAGC IFQ access area trip allocation (i.e., 571 trips) available in both Area II and the Nantucket Lightship North. There would not be a specific number of trips allocated to Area II or the Nantucket Lightship North, but rather, vessels would be able to fish in either area with trip counts to total trip allocation.

Cumulative Economic Impacts

- The cumulative impacts of the measures from Framework 36 proposed measures, and the past actions including Amendment 10, Amendment 11, Amendment 15, and Framework 28 through 34 to the scallop FMPs, are estimated to be positive over the long-term. Adjustment of the open area DAS allocations, implementation of trip limits and allocations for the access areas through rotational management had positive impacts on the scallop industry by increasing the revenues, producer and

consumer surpluses and net benefits in the past. However, the Framework 36 measures are estimated to have negative impacts on total economic benefits in the short-term compared to Framework 34 projections. The preferred alternative in Framework 36 is expected to decrease economic benefits compared to the preferred alternative in Framework 34 in the short-run, but higher benefits in the long-run.

- The short-run (FY2023) total economic benefit for the FW36 preferred alternative is lower by about $73 million (in 2022 dollars) and by about $47 million (in 2001 dollars) compared to the preferred alternative in FW34 (FY2022).
- Annualized long-term total economic benefit for the preferred alternative in FW36 (FY2023-2037) compared to the preferred alternative in FW34 (FY2022-2036) are higher by about $69 million (at 7% discount rate) and $75 million (at 3% discount rate) (Table 102 and Table 103). As a result, cumulative economic benefits over the long-term are expected to be positive.

Table 98 – Economic impact comparison of preferred alternatives in FW36 and FW34: Estimated landings (Mill.lb.), revenue and economic benefits (Economic estimates in 2022 dollars, Mil. dollars)

Scallop Framework	FW36 (FY2023) Proposed Action	FW34 (FY2022)
	Proposed Action	Baseline
Economic Values in	2022 dollars	2022 dollars
Landings mil lbs.	25.007	34.04
Revenue	$398.63	$473.34
Producer Surplus (PS)	$301.73	$380.14
Total Economic Benefits (CS+PS)	$322.15	$395.31
Net Values or Difference from FY2022 (FW34 Action projection) values:		
Landings mil lbs.	-9.03	0.00
Revenue	-$74.71	$0.00
Producer Surplus (PS)	-$78.41	$0.00
Total Economic Benefits (CS+PS)	-$73.16	$0.00

Table 99 Economic impact comparison of preferred alternatives in FW36 and FW34: Estimated landings (Mill.lb.), revenue and economic benefits (in GDP deflated 2001 dollars, Mil. dollars)

Scallop Framework	FW36 (FY2023)	FW34 (FY2022)
	Proposed Action	Baseline
Economic Values in	2001 dollars	2001 dollars
Landings mil lbs.	25.007	34.04
Revenue	$255.98	$303.95
Producer Surplus (PS)	$193.75	$244.10
Total Economic Benefits (CS+PS)	$206.87	$253.85
Net Values or Difference from FY2022 (FW34 Action projection) values:		
Landings mil lbs	-9.03	0.00
Revenue	-$47.97	$0.00
Producer Surplus (PS)	-$50.35	$0.00
Total Economic Benefits (CS+PS)	-$46.98	$0.00

Table 100. Short-term Economic Impacts for FY2023 compared with FW2022: Estimated Landings (Mil. lbs.), revenues, producer surplus, and total economic benefits (in 2022 current dollars, Mil. dollars).

Alternatives/Runs	Framework 36 Alternatives								FR34's Preferred Alternative	FR34's Preferred Alternative
	Alt 1 NA	Alt2 Opt1	Alt2 Opt2	Alt3 Opt1	Alt3 Opt2 (Preferred)	Alt4 Opt1	Alt4 Opt2	Alt5 SQ		
Sections=> Economic Variables	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ	(in 2022$)	(in 2021$)
Landings mil lbs.	20.214	22.619	23.720	23.909	25.007	25.208	26.306	28.301	34.04	34.04
Revenue	$329.77	$364.48	$379.83	$383.44	$398.63	$402.34	$417.38	$445.78	$473.34	$437.37
Producer Surplus (PS)	$245.34	$272.80	$284.87	$289.80	$301.73	$306.62	$318.39	$342.67	$380.14	$351.25
Total Economic Benefits (CS+PS)	$258.84	$289.64	$303.30	$308.55	$322.15	$327.40	$340.93	$368.40	$395.31	$365.27
Net Values or Difference from FY2022 (FW34's Preferred Alternative projection) values:										
Landings mil lbs.	-13.83	-11.42	-10.32	-10.13	-9.03	-8.83	-7.73	-5.74	0.00	
Revenue	-$143.57	-$108.86	-$93.51	-$89.90	-$74.71	-$71.00	-$55.96	-$27.56	$0.00	
Producer Surplus (PS)	-$134.79	-$107.34	-$95.27	-$90.33	-$78.41	-$73.52	-$61.74	-$37.47	$0.00	
Total Economic Benefits (CS+PS)	-$136.47	-$105.67	-$92.01	-$86.76	-$73.16	-$67.91	-$54.38	-$26.91	$0.00	

* A negative sign indicates a lower value for a FW36 alternative compared to the FW34's preferred alternative.

Table 101 - Short-term Economic Impacts for FY2023 compared with FY2022: Estimated landings (Mil. lbs.), revenues, producer surplus and Total economic benefits (in 2001 constant dollars, Mil. dollars).

Alternatives/Runs	Framework 36 Alternatives								FR34's Preferred Alternative	FR34's Preferred Alternative
	Alt 1 NA	**Alt2 Opt1**	**Alt2 Opt2**	**Alt3 Opt1**	**Alt3 Opt2 (Preferred)**	**Alt4 Opt1**	**Alt4 Opt2**	**Alt5 SQ**		
Sections=> Economic Variables	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	**4.3.5 SQ**	(in 2001$)	(in 2021$)
Landings mil lbs.	20.214	22.619	23.719	23.909	25.007	25.207	26.305	28.300	34.04	34.04
Revenue	$211.76	$234.05	$243.91	$246.22	$255.98	$258.36	$268.02	$286.25	$303.95	437.37
Producer Surplus (PS)	$157.55	$175.18	$182.93	$186.10	$193.75	$196.90	$204.46	$220.04	$244.10	351.25
Total Economic Benefits (CS+PS)	$166.21	$185.99	$194.77	$198.14	$206.87	$210.24	$218.93	$236.57	$253.85	365.27
Net Values or Difference from FY2022 (FW34's Preferred Alternative projection) values:										
Landings mil lbs.	-13.83	-11.42	-10.32	-10.13	-9.03	-8.83	-7.73	-5.74	0.00	
Revenue	-$92.19	-$69.90	-$60.05	-$57.73	-$47.97	-$45.59	-$35.94	-$17.70	$0.00	
Producer Surplus (PS)	-$86.56	-$68.93	-$61.17	-$58.01	-$50.35	-$47.21	-$39.65	-$24.06	$0.00	
Total Economic Benefits (CS+PS)	-$87.63	-$67.86	-$59.08	-$55.71	-$46.98	-$43.61	-$34.92	-$17.28	$0.00	

* A negative sign indicates a lower value for a FW36 alternative compared to the FW34's preferred alternative.

Table 102 - Long-term Economic Impacts (FY2023-2037) for FW36: Cumulative present value of revenues and total economic benefits *net of Status Quo* values (Monetary values in Mill. dollars, in 2001 constant dollars, 7% discount rate).

	Framework 36 Alternatives								FR34's Preferred Alternative	FR34's Preferred Alternative
Alternatives/Runs	**Alt 1 NA**	**Alt2 Opt1**	**Alt2 Opt2**	**Alt3 Opt1**	**Alt3 Opt2 (Preferred)**	**Alt4 Opt1**	**Alt4 Opt2**	**Alt5 SQ**		
Sections=> Economic Variables	**4.3.1**	**4.3.2.1**	**4.3.2.2**	**4.3.3.1**	**4.3.3.2**	**4.3.4.1**	**4.3.4.2**	**4.3.5.1**	(in 2001$)	(in 2021$)
Landings million lbs.	851.91808	851.61384	851.61384	851.86737	851.87399	852.10547	852.10547	852.2642	822.456	822.456
Revenue	$4,676.40	$4,678.15	$4,680.58	$4,683.08	$4,685.38	$4,687.72	$4,689.99	$4,698.82	$4,249.93	$6,115.40
Producer Surplus	$3,821.63	$3,821.68	$3,823.04	$3,825.99	$3,827.22	$3,829.95	$3,831.16	$3,838.21	$3,528.34	$5,077.09
Total Economic Benefits	$4,390.44	$4,388.98	$4,389.77	$4,392.80	$4,393.53	$4,396.30	$4,397.08	$4,402.74	$3,765.70	$5,418.63
Difference from FW34 Preferred Alternative Values:										
Landings mil lbs	29.46	29.16	29.16	29.41	29.42	29.65	29.65	29.81	0.00	
Revenue	$426.48	$428.23	$430.66	$433.15	$435.45	$437.80	$440.06	$448.90	$0.00	
Producer Surplus (PS)	$293.28	$293.34	$294.70	$297.64	$298.88	$301.60	$302.81	$309.86	$0.00	
Total Economic Benefits (CS+PS)	$624.74	$623.28	$624.07	$627.09	$627.82	$630.59	$631.38	$637.04	$0.00	
*Annualized value = PMT(0.07,15,NetCPV$)	$68.59	$68.43	$68.52	$68.85	$68.93	$69.24	$69.32	$69.94	$0.00	

*Annualized value of the cumulative present value of the net total economic benefits. A negative sign indicates a lower value for a FW36 alternative compared to FW34's preferred alternative.

Table 103 - Long-term Economic Impacts (2023-2037) for FW36: Cumulative present value of revenues and total economic benefits net of Status Quo values (Monetary values in Mill. dollars, in 2001 constant dollars, 3% discount rate).

Alternatives/Runs	Framework 36 Alternatives								FR34's Preferred Alternative	FR34's Preferred Alternative
	Alt 1 NA	Alt2 Opt1	Alt2 Opt2	Alt3 Opt1	Alt3 Opt2 (Preferred)	Alt4 Opt1	Alt4 Opt2	Alt5 SQ		
Sections=>	4.3.1 NA	4.3.2.1 22d10k	4.3.2.2 24d10k	4.3.3.1 22d12k	4.3.3.2 24d12k	4.3.4.1 22d14k	4.3.4.2 24d14k	4.3.5 SQ		
Economic Variables									(in 2001$)	(in 2021$)
Landings million lbs.	851.91808	851.61384	851.61384	851.86737	851.87399	852.10547	852.10547	852.2642	822.46	822.456
Revenue	$6,057.16	$6,057.69	$6,059.48	$6,061.87	$6,063.54	$6,065.74	$6,067.39	$6,074.32	$5,421.80	$7,802
Producer Surplus	$4,959.62	$4,958.67	$4,959.49	$4,962.30	$4,963.00	$4,965.56	$4,966.25	$4,971.56	$4,505.27	$6,483
Total Benefits	$5,711.91	$5,709.18	$5,709.25	$5,712.09	$5,712.12	$5,714.67	$5,714.76	$5,718.06	$4,812.18	$6,924
Difference from FW34 Preferred Alternative Values:										
Landings mil lbs.	29.46	29.16	29.16	29.41	29.42	29.65	29.65	29.81	0.00	
Revenue	$635.37	$635.89	$637.68	$640.07	$641.74	$643.95	$645.60	$652.52	$0.00	
Producer Surplus (PS)	$454.34	$453.40	$454.22	$457.02	$457.72	$460.29	$460.97	$466.28	$0.00	
Total Economic Benefits (CS+PS)	$899.73	$897.00	$897.08	$899.92	$899.95	$902.49	$902.59	$905.88	$0.00	
*Annualized value = PMT(0.07,15,NetCPV$)	$75.37	$75.14	$75.15	$75.38	$75.39	$75.60	$75.61	$75.88	$0.00	

***Annualized value of the cumulative present value of the net total economic benefits. A negative sign indicates a lower value for a FW36 alternative compared to FW34's preferred alternative.**

7.12.5.2 Enforcement Costs

The enforcement costs and benefits of the proposed options for Framework 36 are within the range of impacts addressed in Section 8.9 of Amendment 10 FSEIS and Section 5.4.22 and Section 5.6.3 of Amendment 11 and Section 5.4.2 of Amendment 15. The qualitative analysis included a discussion of the pros and cons of the proposed alternatives from an enforcement perspective. The proposed measures by Framework 36 are very similar to the existing measures in Framework 34 in terms of the enforcement requirements, since they include the continuation of the area specific trip allocations, area closures, open area DAS allocations, measures for reducing bycatch, and the continuation of observer coverage program. The costs of implementing and enforcing the preferred alternative are not expected to compromise the effectiveness of implementation and enforcement of this action. Furthermore, there are several mechanisms and systems, such as VMS monitoring and data processing, already in place that will aid in monitoring and enforcement of this action. Therefore, the overall enforcement costs are not expected to change significantly from the levels necessary to enforce measures under the No Action regulations.

7.12.6 Determination of Significant Regulatory Action

Executive order 12866 defines a "significant regulatory action" as one that is likely to result in:

i. an annual effect on the economy of $100 million or more, or one which adversely affects in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities;
ii. a serious inconsistency or interference with an action taken or planned by another agency;
iii. a budgetary impact on entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof;
iv. novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order.

Framework 36 is not expected to constitute a "significant regulatory action" based on the economic analyses provided in Section 6.6.1.3 and summarized below:

- The economic benefits are expected to decline between FY2022 and FY 2023 (see Table 100) as a result of declining allocations between these two fishing years. The preferred alternative in Framework 36 is expected to decrease economic benefits compared to the preferred alternative in Framework 34 in the short-run but not over the long-run.
- Compared to the preferred alternative in FW34, the short-run (FY2023) total economic benefit for the FW36 preferred alternative is lower by about $73.16 million in 2022 dollars and $46.98 million in 2001 dollars (Table 101).
- Over the long-run (FY2023 to FY2037), the preferred alternative in FW36 is estimated to have positive impacts on the total economic benefits compared to preferred alternative in FW34 (FY2022-FY2036). Annualized values in the long-run for the FW36 are about $68.93 million ($75.39 million) using a discount rate of 7% (3%) measured in terms of 2001 dollars (Table 102 and Table 103).
- The preferred alternative will not have an annual net impact on the economy by more than $100 million compared to 2022 projections (Framework 34) in the short-term.
- While economic benefits may be declining, this is not unexpected, and the proposed alternatives will not adversely affect in a material way the economy, productivity, competition, public health or safety, jobs or state, local, or tribal governments or communities in the long-run and will not raise novel legal and policy issues, other than those that were already addressed and analyzed in Amendment 10, Amendment 11 and Amendment 15.

- The preferred alternative could have negative impacts on employment (measured in terms of total crew days (Crew*DAS)) compared to FY2020 levels in the short-term (16% decrease in employment), but a long-term increase in employment by 6.23%. The short-term decline in employment level is primarily due to the decline in projected landings in FW36.
- The preferred alternative also does not interfere with an action planned by another agency, since no other agency regulates the level of scallop harvest. It does not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients.

7.13 Initial Regulatory Flexibility Analysis

The purpose of the Regulatory Flexibility Analysis (RFA) is to reduce the impacts of burdensome regulations and record-keeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. Based on this information, the Regulatory Flexibility Analysis determines whether the preferred alternative would have a "significant economic impact on a substantial number of small entities."

An IRFA has been prepared, as required by Section 603 of the Regulatory Flexibility Act (RFA). The IRFA consists of Framework 36 analyses, its draft IRFA, and the preamble to this action.

7.13.1 Statement of Objective and Need

This action proposes the management measures and specifications for the Atlantic Sea scallop fishery for the 2023 fishing year, with 2024 default measures. A description of the action, why it is being considered, and the legal basis for this action, are contained in Framework 36 and are not repeated here.

The proposed regulations would affect all vessels with Limited Access (LA), Limited Access General Category IFQ (LAGC IFQ), and Limited Access General Category NGOM (LAGC NGOM) scallop permits. Framework 36 (Section 5.6) and the LAGC IFQ Performance Evaluation (2017)[30] provide extensive information on the number of vessels that would be affected by the proposed regulations, their home and principal state, dependency on the scallop fishery, and revenues and profits. There were 315 vessels that held full-time LA permits in FY2021, including 250 dredge, 54 small-dredge, and 11 scallop trawl permits. In the same year, there were also 29 part-time LA permits in the sea scallop fishery. No vessels were issued occasional scallop permits in 2021. In 2019, NMFS reported that there was a total of 300 IFQ only permits, with 212 issued and 88 in CPH. There was a total of 110 NGOM permits issued in 2019. About 114 of the IFQ vessels and 53 NGOM vessels actively fished for scallops in FY2021. The remaining IFQ permits likely leased out scallop IFQ allocations with their permits in Confirmation of Permit History.

On December 29, 2015, NMFS issued a final rule establishing a small business size standard of $11 million in annual gross receipts for all businesses primarily engaged in the commercial fishing industry (NAICS 11411) for Regulatory Flexibility Act (RFA) compliance purposes only. The $11 million standard became effective on July 1, 2016. Thus, the RFA defines a small business in the shellfish fishery as a firm that is independently owned and operated with receipts of less than $11 million annually. Individually permitted vessels may hold permits for several fisheries, harvesting species of fish that are regulated by several different fishery management plans, even beyond those impacted by the proposed action. Furthermore, multiple permitted vessels and/or permits may be owned by entities affiliated by stock ownership, common management, identity of interest, contractual relationships, or economic dependency.

[30] https://d23h0vhsm26o6d.cloudfront.net/180202_LAGC_IFQ_Council_Approved.pdf

For the purposes of this analysis, "ownership entities" are defined as those entities with common ownership as listed on the permit application[31].

On June 1 of each year, ownership entities are identified based on a list of all permits for the most recent complete calendar year.[32] The current ownership dataset is based on the calendar year 2021 permits and contains average gross sales associated with those permits for calendar years 2019 through 2021.

Matching the potentially impacted 2021 fishing year permits described above (LA and LAGC IFQ) to calendar year 2021 ownership data results in 147 distinct ownership entities for the LA fleet and 87 distinct ownership entities for the LAGC IFQ fleet (Table 104 and Table 105). Based on the Small Business Administration (SBA) guidelines, 139 of the LA distinct ownership entities and 87 LAGC IFQ entities are categorized as small. Eight LA and none LAGC IFQ entities are categorized as large business entities with annual fishing revenues over 11 million dollars in 2021. There were 52 distinct small business entities with NGOM permits in 2021 permits (Table 106).

Table 104 - Number of business entities and active vessels (LA permits) in the scallop limited access fishery (revenues in current dollars).

Business Size	Calendar Year	No. of Entities**	No. of Permits*	Total Affiliation Revenue	Total Scallop Revenue***	Average Income from Fishing per Entity
Large	2019	8	100	$175,650,907	$157,845,241	$21,956,363
	2020	8	100	$141,102,532	$127,834,443	$17,637,817
	2021	8	100	$191,985,534	$176,800,580	$23,998,192
Small	2019	138	240	$394,403,418	$363,135,059	$2,857,996
	2020	138	240	$338,441,507	$312,808,035	$2,452,475
	2021	139	241	$471,151,236	$440,464,642	$3,389,577

* Number of permits refer to LA permits that may also hold LGC permits. Affiliations could include several vessels with permits other than scallop as well as some LAGC IFQ permits. The permits associated with entities that did not land scallop is not included in number of permits count. The number of permits would also imply the number of active vessels that landed scallop in the corresponding calendar year.

** Number of entities will have at least one LA permit with scallop landing.

[31] Only permits with identical ownership are categorized as an "ownership entity." For example, if five permits have the same seven persons listed as co-owners on their permit applications, those seven persons would form one "ownership entity," that holds those five permits. If two of those seven owners also co-own additional vessels, that ownership arrangement would be considered a separate "ownership entity" for the purpose of this analysis

[32] The data for the RFA analysis is from the Social Science Branch, Northeast Fisheries Science Center.

Table 105 - Number of active vessels (permits) and business entities with LAGC IFQ permits (revenues in current dollars).

Business Size	Calendar Year	No. of Entities **	No. of Permits *	Total Affiliation Revenue	Total Scallop Revenue	Average Revenue from Fishing per Entity
Small	2019	81	89	$50,436,681	$23,565,230	$622,675
	2020	85	93	$42,873,765	$21,853,836	$504,397
	2021	87	96	$57,724,029	$31,191,451	$663,495

*Number of permits refer to LAGC IFQ only permits. Affiliations could include several vessels with permits other than scallop. Some of the active LAGC – IFQ permits belong to affiliations with LA permits and are included in Table 104 above. The permits associated with entities that did not land scallop are not included in the number of permits counted.

Table 106 - Number of active vessels (permits) and business entities with LAGC NGOM permits (revenues in current dollars).

Business Size	Calendar Year	No. of Entities**	No. of Permits*	Total Affiliation Revenue	Total Scallop Revenue	Average Revenue from Fishing per Entity
Small	2019	48	55	$17,144,467	$5,072,152	$357,176
	2020	47	54	$13,520,460	$4,950,354	$287,669
	2021	52	57	$20,861,826	$6,772,611	$401,189

*Number of permits refer to LAGC NGOM only permits. Affiliations could include several vessels with permits other than scallop. The permits associated with entities that did not land scallop is not included in number of permit count.

** Number of entities will have at least one LGC NGOM permit with scallop landing.

7.13.1.1 Description of Projected Reporting, Recordkeeping, and other Compliance Requirements of the Proposed Rule

This action contains no new collection-of-information, reporting, or recordkeeping requirements. It does not duplicate, overlap, or conflict with any other Federal law.

7.13.1.2 Federal Rules Which May Duplicate, Overlap, or Conflict with this Proposed Rule

The proposed regulations do not create overlapping regulations with any state regulations or other federal laws.

7.13.1.3 Summary of the Proposed Action and Significant Alternatives

7.13.1.3.1 Framework 36 Specifications Measures

Framework 36 is a one-year action that will be implemented for the fishing year 2023. The Council's preferred alternative (Section 4.3.3.2) and other Framework 36 alternatives are summarized in Table 104 above. A detailed

description of each specification alternative is provided in Section 4.3 of Framework 36. For the purposes of this RFA analysis, the Council's preferred alternative is evaluated relative to the FY2022 projections for the Framework 34 preferred alternative (as Status Quo).

Table 107 and Table 108 include the No Action alternative as well as the FY 2022 projections from Framework 34, which are used as a baseline (status quo) to compare the economic impacts of the Framework 36 alternatives. The definition of "No Action" (Section 4.3.1) follows a regulatory approach and refers to the default measures that are specified in the previous action, Framework 34, until this action is implemented in 2023. These correspond only to a fraction of allocations for the entire year and are intended to be replaced with subsequent measures based on updated survey information. Therefore, the economic benefits of proposed action and alternatives will considerably exceed the benefits for the "No Action" because default allocations under those measures have been set at precautionary levels.

The primary objective of Framework 36 is broader in scope than just replacing the temporary default measures set in the previous framework to prevent issues related to the delays in implementation. In this analysis, the status quo comparison for specifications focuses on the differences between the Council's preferred alternative in FY2022 (FW34) and the preferred alternative for FY2023 (FW36). The FY 2022 allocations included open area DAS set at 24 DAS (F=0.39) and each FT vessel receiving 3 access area trips. For FY2023, the Council's preferred alternative (4.3.3.2) would allocate 24 DAS (F=0.51) and 2 access area trips to FT LA vessels, with landings projected to decline by about 9 million pounds. Using the FY 2022 estimates from Framework 34 better reflects the changing conditions between 2022 and 2023. For these reasons, the FY 2022 (FW34) baseline is used to evaluate the impacts of the proposed measures on small business entities to address the requirements of the Regulatory Flexibility Act.

7.13.1.3.1.1 Summary of the Proposed Action

If the preferred alternative (Section 4.3.3.2) is approved, Framework 36 would allocate each FT limited access vessel 24 open area DAS and 2 access area trips (i.e., 2 CAII trips at 12,000 pounds) amounting to 24,000 pounds in FY2023. This is estimated to result in about 22.86 million pounds of landings after research and observer set asides are accounted for. The LA share of 94.5% is around 21.6 million pounds (Table 107). The LAGC IFQ share (5.5% allocation for both IFQ only and LA vessels with IFQ permits) will be about 1.257 million lbs. (Section 4.4.2, Table 108). Total landings, including set-asides to support research and observer coverage is projected to be about 25.01 million (Table 107).

The preferred alternative (Section 4.3.3.2) is expected to have negative impacts on the net revenues and profits of small entities regulated by this action in FY2023 (FW36) compared to the FY2022 (FW34) scenario. The decline in revenue per entity between FY2022 levels and FY 2023 is a result of declining allocations between these two fishing years. Projected landings for LA fleet are expected to decline by about 8.09 million pounds in the FW36 preferred alternative compared to FW34 preferred alternative. As described in the Economic Impacts Section 6.6.1, and summarized in Table 107 above, fleetwide net revenue for the LA vessels (including revenue from the LAGC IFQ vessels) would be lower for the preferred alternative in FW36 (Section 4.3.2.2) by about $82 million (in 2022 dollars) compared to the preferred alternative in FW34. Net revenue for LA vessels in FY2023 under the FW36 preferred alternative would be $0.053 million lower per entity as compared to FW34 preferred alternative in FY2022. Thus, the preferred alternative (Section 4.3.2.2) would have 2.43% lower net revenue compared to the FW34 preferred alternative.

Under the preferred alternative (Section 4.3.2.2), allocations for the LAGC IFQ fishery, including the LA vessels with IFQ permits, will be about 27.2% lower than the allocation that was implemented for FY2022 under FW34. In terms of net revenue, this difference is expected to be of similar magnitude and negative for the preferred alternative relative to FY2022 levels. Therefore, the FW36 preferred alternative will have negative economic impacts on the LAGC IFQ fishery compared to FY2022 levels (Table 108).

Table 107 - Net scallop revenue for Limited Access vessels in FY2023 and % change from the FY2022 (revenues in 2022 dollars).

		FW36 Alternatives (Economic Values in million dollars (in 2022$)							FW34's Preferred Alternative
Alternatives/Runs		**Alt. 1**	**Alt. 2 Opt. 1**	**Alt. 2 Opt. 2**	**Alt. 3 Opt. 1**	**Alt. 3 Opt. 2 (Preferred)**	**Alt. 4 Opt. 1**	**Alt. 4 Opt. 2**	**(in 2022$)**
Description	**Unit**	**4.3.1 NA**	**4.3.2.1 22d10k**	**4.3.2.2 24d10k**	**4.3.3.1 22d12k**	**4.3.3.2 24d12k**	**4.3.4.1 22d14k**	**4.3.4.2 24d14k**	
Estimated scallop APL landings mil lbs	mil lbs	20.214	22.619	23.720	23.909	25.007	25.208	26.306	34.039
Estimated LA scallop landings (94.5% net of set asides) mil lbs	mil lbs	17.07	19.34	20.38	20.56	21.60	21.79	22.83	29.690
No. of Entities (Average in 2019-2021) both small and large	Counts	146	146	146	146	146	146	146	177
Estimated revenues for scallop APL $mil	mil dollars	$329.77	$364.48	$379.83	$383.44	$398.63	$402.34	$417.38	$476.51
Estimated LA revenues from scallop $ mil	mil dollars	$278.50	$311.71	$326.42	$329.78	$344.33	$347.79	$362.20	$415.63
Estimated Net Revenue for scallop APL $mil	mil dollars	$301.733	$331.499	$344.615	$349.126	$362.089	$366.606	$379.420	$444.55
Estimated LA net revenue from scallop $mil	mil dollars	$254.82	$283.50	$296.15	$300.27	$312.77	$316.90	$329.26	$387.75
Net scallop revenue per Entity $mil	mil dollars	$1.741	$1.937	$2.024	$2.052	$2.137	$2.166	$2.250	$2.191
% change in net revenue compared to SQ (FW34 pref alt)	Percent	-20.51%	-11.56%	-7.61%	-6.33%	-2.43%	-1.14%	2.71%	0.00%

Note: landings and net revenues net of set asides, such as research set aside scallop, etc..

Table 108 - Impacts of the LAGC IFQ Allocation for the fishing year 2022.

FW36 Alternatives	Framework 36 Alternatives							
Sections	4.3.1	4.3.2.1	4.3.2.2	4.3.3.1	4.3.3.2 (*Preferred*)	4.3.4.1	4.3.4.2	FR34's Preferred Alternative
Descriptions								
Allocation for IFQ only vessels (5%) (lbs.)	903,247	1,023,509	1,078,515	1,087,994	1,142,890	1,152,921	1,207,816	1,570,904
Allocation for LA vessels with IFQ permits (0.5%) (lbs.)	90,325	102,351	107,851	108,799	114,289	115,292	120,782	157,090
Total Allocation* for IFQ fishery (5.5%) (lbs.)	993,572	1,125,860	1,186,366	1,196,794	1,257,179	1,268,213	1,328,597	1,727,994
% Change in estimated landings (and revenue) per business entity from SQ (FW34 Pref Alt)	-42.5%	-34.8%	-31.3%	-30.7%	-27.2%	-26.6%	-23.1%	0.0%

*APL w/ set aside removed

7.13.1.3.1.2 Description of Significant Alternatives to the Proposed Action

The economic benefits of all of the alternatives considered in this Framework, including the proposed alternative, will exceed economic benefits of No Action. The specification alternatives considered in Framework 36 are very similar, with each alternative allocating to the same access area allocations. Differences between the options are driven by the number of DAS allocated, which range from 22 to 24 DAS and trip limits range from 10,000 pounds to 14,000 pounds. The Council's preferred alternative, Alternative 3, Option 2 (4.3.3.2) would result in a lower allocation to the LA and LAGC IFQ components in 2023. This is expected to result in lower revenues compared to FW34 preferred alternative in FY2022 (Table 107 and Table 108). The percent change in net revenue per business entity for all FW36 alternatives is expected to decline between -11.56% and 2.71% compared to FW34 preferred alternative. Under the preferred alternative in FW36, net revenues per entity with LA permits are estimated to be below FY 2022 levels by -2.43% in FY2023 (Table 107).

7.13.1.4 Northern Gulf of Maine (NGOM) Management Measures

The measures for the NGOM scallop fishery considered in this action are described in detail in Section 4.2 of Framework 36. The economic impacts of the NGOM alternatives are analyzed in Section 6.6.1.2 of the Framework documents. The Council's *preferred alternative* (Alternative 2, Option 3) would allocate a lower NGOM Set-Aside (380,855 lbs.) relative to No Action (Alternative 1, NGOM Set-Aside of 448,062 lbs.). As a result, the net revenue for the LAGC NGOM fishery is expected to decrease by about $0.707 million under the preferred measure compared to the No Action. This is expected to result in low negative impacts on the profits of NGOM LAGC entities. For the 2023 fishing year, the overall shares for LAGC vessels will be 416,393 pounds, which includes 35,538 pounds set-aside to support research and help offset the cost of monitoring the fishery.

The NGOM TAL for the LAGC component under the preferred alternative (434,311 pounds), would be lower than the No Action NGOM Set-Aside (448,062 pounds). As a result, the net revenue for the LAGC NGOM fishery is expected to decrease by about 15% under the preferred measure compared to the No Action with negative impacts on the profits of NGOM LAGC entities (Table 109).

7.13.1.4.1 Description of Significant Alternatives to the Proposed Action

The Council considered four NGOM TAL options for FY2023 that ranged from 357,149 pounds (Option 1) to 511,472 pounds (Option 4). All TAL options, except Option 4, would result in lower revenues compared to No Action, which are default measures set in Framework 34. The preferred alternative (Alternative 2, Option 3) would have a slightly lower TAL (434,311 pounds) compared to the Alternative 2 Option 4, but higher revenues than Option 1 and Option 2. When compared to No Action, the lower TAL of Option 3 would also result in lower revenues and economic benefits for entities in this fishery with an estimated decrease in net revenues by about 15% compared to No Action (Table 109).

Table 109 - Impacts of the Preferred Alternative 2 Option 3 and other alternatives for NGOM scallop fishery (2023 fishing year and monetary values in 2022 dollars).

Data and Values	FY2023				
	Alternative 1 (No Action)	Alternative 2			
		Option 1	Option 2	Option 3 Preferred	Option 4
		F=0.15	F=0.18	F=0.15	F=0.18
LA/RSA share - scallop lbs.		25,000	25,000	25,000	25,000
1% NGOM ABC for Observers		10,538	10,538	10,538	10,538
LAGC share - scallop lbs.	**448,062**	**303,693**	**367,627**	**380,855**	**458,016**
Total Pounds w/ RSA, observers, etc.		357,149	421,083	434,311	511,472
Impacts on the LAGC NGOM share—scallop lbs.:					
· Estimated LAGC revenue	$6,953,922	$4,713,315	$5,705,571	$5,910,870	$7,108,408
· DAS	2,240	1,518	1,838	1,904	2,290
· Trip costs ($1,000 per DAS)	$2,240,310	$1,518,465	$1,838,135	$1,904,275	$2,290,080
· Net revenue	**$4,713,612**	**$3,194,850**	**$3,867,436**	**$4,006,595**	**$4,818,328**
· **Net revenue net of No Action**	$0	**($1,518,762)**	**($846,176)**	**($707,018)**	**$104,716**
Net revenue net of No Action %	0.00%	-32.2%	-18.0%	-15.0%	2.2%

Under the sharing arrangement approved for the NGOM Management Area in Amendment 21, Framework 36 would not allocate pounds to the LAGC IFQ or LA components for FY 2023 because the NGOM set-aside did not exceed 800,000 pounds. Therefore, Action 2 would not have direct impacts on Limited Access component. More research is planned for this area in 2023, which will help to increase the understanding of biomass in the NGOM management area. This will lead to better management of the NGOM resource with positive biological and economic impacts over the long-term on both LAGC and LA vessels.

7.13.1.5 LAGC IFQ Access Area Allocations

The LAGC IFQ component is allocated 5.5% of access area allocations under each specification alternative presented in Table 108. Alternative 2 could have positive economic impacts on LAGC IFQ vessels overall compared to Alternative 1.

When 5.5% is applied to the FT LA access area allocations from 4.3.3.2 (2 trips at 12,000 pounds) for FY2023, the LAGC IFQ component would receive 571 trips (with an 800-pound trip limit) which is less than the FY2022 allocation. Under the Council's preferred alternative in Section 4.3, the total LAGC IFQ access area allocation is 571 trips under Alternative 2 in Section 4.4. The total LAGC IFQ access area trip allocation (i.e., 571 trips) would be available in both Area II and the Nantucket Lightship North. There would not be a specific number of trips allocated to Area II or the Nantucket Lightship North, but rather, vessels would be able to fish in either area and trips would be counted against the total trip allocation. Once the total trip allocation is projected to have been taken, both areas would be closed to LAGC IFQ access area fishing for the remainder of the fishing year. While the areas would close to rotational fishing, the LAGC IFQ component would be able to access the Nantucket Lightship North as part of open bottom after the 571 trips are taken. Alternative 2 could have positive economic impacts on LAGC IFQ vessels overall in the long run and compared to Alternative 1.

7.13.1.5.1.1 Description of Significant Alternatives to the Proposed Action

The Council considered two alternatives for LAGC IFQ access area allocations. As noted above, Alternative 2, with the Council's preferred in Section 4.3 would allocate 571 total trips, and they would be available in the Nantucket Lightship North and Area II. Under Alternative 1, the number of total access area trips to Closed Area I would be 357. Since LPUE in the open bottom is projected to decline in FY2023, LAGC IFQ vessels may have fewer opportunities to target larger scallops in areas of high abundance and would likely utilize rotational trips. The preferred alternative for LAGC access area allocations would have the highest economic benefits for the small business entities in the LAGC IFQ fishery compared to No Action.

7.13.1.6 Summary and Conclusions

Economic impacts of Framework 36 preferred alternatives, including fishery specifications, access area trip allocations for the LA and LAGC IFQ fisheries, NGOM measures, and other measures to reduce fishery impacts are expected to be negative for the scallop vessels and small business entities compared to the FY 2022 baseline implemented through FW34.

8.0 GLOSSARY

Annual projected landings – The annual projected landings are the model-based estimate of scallop fishery landings for a given fishing year, accounting for the spatial management of the fishery (*see also* area based management *and* area rotation). The APL is equal to the combined projected landings by the limited access and LAGC IFQ fleets in both the open area and access areas, after set-asides (RSA and observer) and incidental landings are accounted for, for a given fishing year. Projected scallop landings are calculated by estimating the landings that will come from open and access area effort combined for both limited access and LAGC IFQ fleets.

Area based management – in contrast to resource wide allocations of TAC or days, vessels would receive authorization to fish in specific areas, consistent with that area's status, productivity, and environmental characteristics. Area based management does not have to rotate closures to be effective.

Area rotation – a management system that selectively closes areas to fishing for short to medium durations to protect small scallops from capture by commercial fishing until the scallops reach a more optimum size. Closed areas would later re-open under special management rules until the resource in that area is similar to other open fishing areas. Area rotation is a special subset of area-based management that relies on an area closure strategy to achieve the desired results when there are sufficient differences in the status of the management areas.

Biological Opinion – an ESA document prepared by either the NMFS or USFWS describing the impacts of a specific Federal action, including an FMP, on endangered or threatened species. The Biological Opinion concludes whether or not the NMFS/USFWS believe that the actions are likely to jeopardize the continued existence of any of the protected species and provides recommendations for avoiding those adverse impacts.

Consumer surplus - The net benefit 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 landings go up.

Critical habitat – an area that has been specifically designated under the ESA as an area within the overall geographical region occupied by an endangered or threatened species on which are found the physical or biological features essential to conservation of the species.

Day-at-sea (DAS) – is each 24-hour period that a vessel is on a scallop trip (i.e. not declared out of the day-at-sea program) while seaward of the Colregs line.

Endangered species – a species that is in danger of extinction throughout all or a significant portion of its range.

Exploitable biomass - the total meat weight of scallops that are selected by fishing, accounting for gear and cull size, at the beginning of the fishing year[33].

Fixed costs - These costs include expenses that are generally independent of the level of fishing activity, i.e., DAS-used, such as insurance, license, half of repairs, office expenses, professional fees, dues, utility, interest, dock expenses, bank, rent, store, auto, travel, and employee benefits.

Incidental Take Statement – a section of a Biological Opinion that allows the take of a specific number of endangered species without threat of prosecution under the ESA. For the Scallop FMP, an incidental take statement has been issued for a limited number of sea turtles to be taken by permitted scallop vessels.

LPUE – Similar to catch per unit effort (CPUE), commonly used terminology in fisheries, LPUE in the Scallop FMP refers to the amount of landings per DAS a vessel achieves. This value is dependent on the scallop abundance and catch rate, but also depends on the shucking capacity of the crew and vessel, since most of the scallop catch must be shucked at sea. Since discard mortality for sea scallops is low, discards are not included as a measure of catch in the calculation of LPUE.

Meat yield – the weight of a scallop meat in proportion to the total weight or size of a scallop. Scallops of similar size often have different meat yields due to energy going into spawning activity or due to the availability of food.

Net economic benefits - Total economic benefits measure the benefits both to the consumers and producers and are estimated by summing consumer and producer surpluses. Net economic benefits show, however, the change in total economic benefits net of no action.

Nominal versus real economic values - The nominal value of fishing revenues, prices, costs and economic benefits are simply their current monetary values unadjusted for inflation. Real values are obtained, however, by correcting the current values for inflation.

Open area – a scallop fishing area that is open to regular scallop fishing rules. The target fishing mortality rate is the resource-wide target.

Operating expenses or variable costs - The operating costs measure the expenses that vary with the level of the fishing activity including food, ice, water, fuel, gear, supplies and half of the annual repairs.

Opportunity cost - The cost of forgoing the next best opportunity. For example, if a fisher's next best income alternative is to work in construction, the wage he would receive from construction work is his opportunity cost.

PDT – Scallop plan Development Team; a committee of experts that contributed to and developed the technical analysis and evaluation of alternatives.

Producer surplus -Producer surplus for a particular fishery shows the net benefits to harvesters, including vessel owners and the crew, and is measured by the difference between total revenue and operating costs.

Recruitment – a new year class of scallops measured by the resource survey. Scallop larvae are pelagic and settle to the bottom after 30-45 days after spawning. The resource survey, using a lined dredge, is able to capture scallops between 20 – 40 mm, but more reliably at between 40 and 60 mm. Recruitment in this document refers to a new year class that is observable in the survey, at around two years after the eggs had been fertilized and spawned.

SAFE Report – A Stock Assessment and Fishery Evaluation Report, required by the Sustainable Fisheries Act. This report describes the present condition of the resource and managed fisheries, and in New England it is

[33] The **average exploitable biomass** is different and is defined as the total meat weight of scallops that are selected by fishing averaged over the fishing year, accounting growth, natural mortality, fishing mortality, and gear and cull size.

prepared by the Council through its Plan Development Teams (PDT) or Monitoring Committees (MC). The Scallop PDT is the MC for the Atlantic Sea Scallop FMP and prepares this report.

Shucking – a manual process of cutting scallop meats from the shell and viscera.

TAC – Total allowable catch is an estimate of the weight of scallops that may be captured by fishing at a target fishing mortality rate. The TAC could apply to specific areas under area-based management rules.

Take – a term under the MMPA and ESA that means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct with respect to either a marine mammal or endangered species.

Ten-minute square – an approximate rectangle with the dimensions of 10-minutes of longitude and 10-minutes of latitude.

Threatened species – any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

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