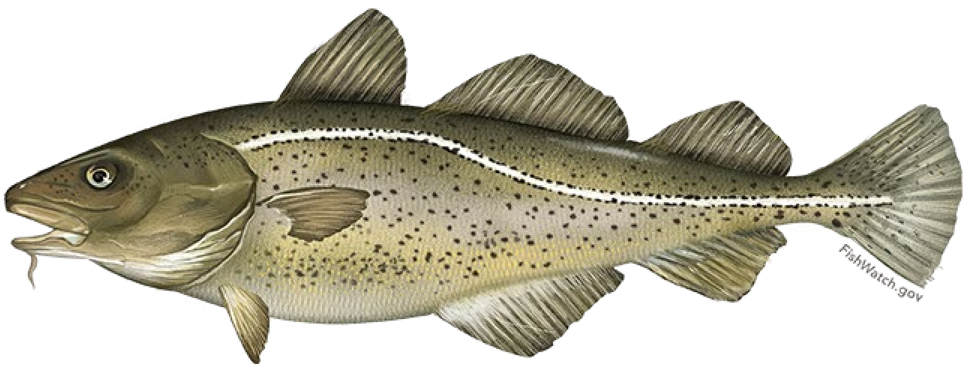
Northeast Multispecies Fishery Management Plan

<u>DRAFT</u> Amendment 25 (Revised)

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



September 2025

Prepared by the
New England Fishery Management Council
In consultation with the
National Marine Fisheries Service and
Mid-Atlantic Fishery Management Council

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Cover image

Fishwatch.gov [https://www.fishwatch.gov/profiles/atlantic-cod]

AMENDMENT 25 (REVISED)

TO THE NORTHEAST MULTISPECIES FISHERY MANAGEMENT PLAN

Proposed Action: Propose incorporating revised Atlantic cod stock units into the FMP and specifications for Atlantic cod for fishing years 2026-2027.

Responsible Agencies:

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Abstract: The New England Fishery Management Council, in consultation with NOAA's National Marine Fisheries Service, has prepared Amendment 25 (Revised) to the Northeast Multispecies Fishery Management Plan, which includes a final environmental assessment that presents the range of alternatives to achieve the goals and objectives of the action. The proposed action focuses on setting specifications for certain groundfish stocks. The document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives on both. It addresses the requirements of the National Environmental Policy Act, the Magnuson Stevens Fishery Conservation and Management Act, the Regulatory Flexibility Act, and other applicable laws.

1.0 EXECUTIVE SUMMARY

Purpose and Need

The purpose of Amendment 25 (A25) is to incorporate the revised Atlantic cod stock units, consistent with the 2023 Atlantic Cod Research Track Assessment, into the Northeast Multispecies Fishery Management Plan (FMP), and set status determination criteria (SDCs), specifications, commercial management measures, and recreational management measures for the four new Atlantic cod stocks. Amendment 25 incorporates the results of new stock assessments for Atlantic cod. The need for this action is to prevent overfishing, ensure rebuilding, and help achieve optimum yield in the commercial and recreational groundfish fisheries consistent with the status of stocks and the requirements of the Magnuson-Stevens Fishery Conservation and Management Act.

Proposed Action

The preferred alternatives include:

Action 1 – Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP: incorporate the four revised Atlantic cod stock units of Georges Bank (GB) Atlantic cod, Eastern Gulf of Maine (EGOM) Atlantic cod, Western Gulf of Maine (WGOM) Atlantic cod, and Southern New England (SNE) Atlantic cod into the Northeast Multispecies FMP

Action 2 – Status Determination Criteria: adopt new SDCs for the four Atlantic cod stock units.

Action 3 – Revised Specifications for Atlantic Cod: set FY2026 specifications for GB cod; set FY2026-FY2027 specifications for EGOM cod, WGOM cod, and SNE cod; define the apportionment method for setting the acceptable biological catch (ABC) of WGOM cod; specify the management uncertainty buffers the Atlantic cod stocks; and set a recreational sub-ACL for SNE cod.

Action 4 – Commercial Fishery Management Measures – Atlantic Cod: adopt common pool trimester TAC distributions and TAC closure areas and establish baseline common pool trip limits for the four revised Atlantic cod stocks.

Action 5 – Recreational Fishery Management Measures – Atlantic Cod: set recreational fishing measures for SNE cod and establish a process for the regional administrator to adjust recreational measures for EGOM and GB cod in FY2026.

Summary of Impacts of the Preferred Alternatives
The following table summarizes the preferred alternatives' impacts by valued ecosystem component (VEC).

Actions and Alternatives/Options		**Direct and indirect impacts**				
		Managed Resources	**Non-target species**	**Habitat/ Essential Fish Habitat**	**Protected Resources**	**Human communities (economic and social impacts)**
Action 1: Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP	**Alt. 3.** Revise Atlantic Cod Stock Units in FMP	No direct or indirect impacts	No direct or indirect impacts	No direct or indirect impacts	No direct or indirect impacts	No direct or indirect impacts
Action 2: Atlantic Cod Status Determination Criteria	**Alt. 2** – New Status Determination for Cod Stocks	Negl. to +	Negl.	Negl.	No direct impacts Indirect impacts: slight – to slight +	Economic: low + Social: Slight – to +
Action 3: Revised Specifications for Atlantic Cod	**Alt. 2** – Revised Specifications	- to slight +	Slight – to slight +	Slight –	Slight – to slight +	Economic: Slight – to + Social: – to low +
	Alt. 3/Option 2 – Set Southern New England Cod Recreational Sub-ACL	+	No direct or indirect impacts	No direct or indirect impacts	Negl. to slight –	Economic: + Social: +
Action 4: Commercial Fishery Management Measures – Atlantic Cod	**Alt. 1 –** Common Pool Accountability Measures for Cod Stocks (Option 2 and 3)	Negl. to +	Negl.	Negl.	Slight – to slight moderate +	Economic: - to + Social: – to +
Action 5: Recreational Fishery Management Measures – Atlantic Cod	**Alt. 1/Option 2 –** Recreational Fishing Measures for Southern New England Cod	Slight +	Negl. to slight +	Negl.	Likely slight – to slight moderate +	Economic: + to – Social: + to –
	Alt. 2/Option 2 – Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks	Negl. to +	No direct or indirect impacts	Negl.	No direct impacts	Economic: Negl. Social: Negl. to low +

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2.5 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
AP	Advisory Panel
APA	Administrative Procedures Act
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
CPUE	Catch per unit of effort
DAS	Day(s)-at-sea
DFO	Department of Fisheries and Oceans (Canada)
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
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
GAR	Greater Atlantic Region
GARFO	Greater Atlantic Regional Fisheries Office
GARM	Groundfish Assessment Review Meeting
GB	Georges Bank
GOM	Gulf of Maine
HAPC	Habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
IFM	Industry-funded monitoring
IFQ	Individual fishing quota
ITQ	Individual transferable quota
MA	Mid-Atlantic
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

NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
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	Trans boundary 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

3.1 BACKGROUND

The Northeast Multispecies (Groundfish) Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species, both target (cod, haddock, yellowtail flounder, pollock, American plaice, witch flounder, white hake, winter flounder, redfish and Atlantic halibut) and non-target (windowpane flounder, ocean pout, and Atlantic wolffish) species off the New England and Mid-Atlantic coasts. Some of these species (cod, haddock, yellowtail flounder, winter flounder, and windowpane flounder) are further sub-divided into individual stocks that are attributed to different geographic areas. Two stocks, Georges Bank (GB) cod and GB haddock, also have management units as a result of the U.S.-Canadian Transboundary Resource Sharing Agreement. The FMP therefore consists of 20 stocks and 2 management units. Commercial and recreational fisheries catch these species.

The New England Fishery Management Council (NEFMC or Council) makes proposals, through various management actions, to the National Marine Fisheries Service (NMFS) for the management of the fishery. As such, the FMP has been updated through a series of amendments and framework adjustments. Amendment 16, which became effective in 2010, adopted a broad suite of management measures to achieve the fishing mortality targets necessary to rebuild overfished stocks and meet other requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Amendment 16 greatly expanded the sector management program and adopted a process for setting annual catch limits (ACLs) that requires catch levels to be set in biennial specifications packages. Amendment 17, effective in 2011, allows for NOAA-sponsored state-operated permit banks to function within the structure of A16. Amendment 18, effective in 2017, addresses fleet diversity and accumulation limits. Numerous framework adjustments have updated the measures in Amendment 16. Amendment 23, effective December 2022/January 2023, addressed improvements to monitoring in the commercial groundfish fishery.

Amendment 16 made major changes to the FMP. The management action adopted a system of ACLs and accountability measures (AMs) that are designed to ensure catches remain below desired targets for each stock in the management complex. AMs are management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur. AMs should address and minimize both the frequency and magnitude of overages and correct the problems that caused the overages in as short a time as possible. AMs can be either in season AMs or AMs for when the ACL is exceeded.

There is no requirement that AMs and ACLs be implemented as hard total allowable catches (TACs) or quotas, but conservation and management measures must prevent the ACL from being exceeded and AMs must apply if the ACL is exceeded (74 FR 3184). While many measures in the management program are intended to control fishing mortality and might be interpreted to be AMs since they are "management controls to prevent the ACL from being exceeded," the term AM is usually applied to specific, automatic measures that are implemented either as an ACL is approached or after an ACL is exceeded.

In April 2024, the Council began work on Amendment 25 to identify four new stock units of Atlantic cod, consistent with the 2023 Atlantic Cod Research Track Assessment, and incorporate the revised stock units into the Northeast Multispecies FMP. Status determination criteria (SDCs), specifications, and accountability measures (AMs) for the four revised cod stock units were included in Framework 69. On May 19, 2025, the Council received a letter from NMFS notifying that Amendment 25 had been disapproved on the basis that the procedural approach to using Framework 69 as a companion trailing action to Amendment 25, as advised by GARFO during development of the actions, did not fully address the requirements of the MSA, and that the Council could resolve the reasons for disapproval by revising and resubmitting the amendment with the elements necessary for the action to be consistent with the

National Standards and required provisions of the MSA (i.e., the SDCs, distribution of ABCs, and accountability measures for the four cod stocks, as developed and included in Framework 69). In June 2025 the Council voted to revise and resubmit Amendment 25, focusing only on reformatting the cod-specific management measures as previously submitted in Amendment 25 (September 2024 Council final action) and Framework 69 (December 2024 Council final action).

3.2 Purpose and Need

The purpose of Amendment 25 is to incorporate the revised Atlantic cod stock units, as identified in the 2023 Atlantic Cod Research Track Assessment, into the Northeast Multispecies FMP, and set status determination criteria (SDCs), specifications, commercial management measures, and recreational management measures for the four new Atlantic cod stocks. Amendment 25 incorporates the results of new stock assessments for Atlantic cod. The need for this action is to prevent overfishing, ensure rebuilding, and help achieve optimum yield in the commercial and recreational groundfish fisheries consistent with the status of stocks and the requirements of MSA.

This amendment includes alternatives (Table 1) that would:

- Incorporate the revised Atlantic cod stock units of GB Atlantic cod, EGOM Atlantic cod, WGOM Atlantic cod, and SNE Atlantic cod into the Northeast Multispecies FMP,
- Set status determination criteria (SDC) for the four new Atlantic cod stock units,
- Set FY2026 specifications for GB cod,
- Set FY2026-FY2027 specifications EGOM cod, WGOM cod, and SNE cod,
- Define the apportionment method for setting the WGOM cod commercial sub-ACL,
- Establish the management uncertainty buffers for the Atlantic cod stocks,
- Set a recreational sub-ACL for SNE cod,
- Adopt common pool trimester TAC distributions and TAC closure areas and establish baseline common pool trip limits for the Atlantic cod stocks,
- Set recreational fishing measures for SNE cod and establish a process for the Regional Administrator to adjust recreational measures for EGOM cod and GB cod.

Table 1 – Purpose and need for Amendment 25.

Purpose	Need
Measures to incorporate the revised Atlantic cod stock units into the Northeast Multispecies FMP	Ensure that groundfish stocks are managed consistently with the requirements of the MSA. Ensure conservation and management measures are based upon the best available scientific information.
Measures to adopt status determination criteria for Atlantic cod	Ensure that groundfish stocks are managed consistently with the status of stocks and the requirements of the MSA. Help prevent overfishing and achieve optimum yield.
Measures to adopt ACLs for Atlantic cod, including relevant sub-ACLs and incidental catch TACs	Ensure that groundfish stocks are managed consistently with the status of stocks and the requirements of the MSA. Ensure that levels of catch for fishing years 2026-2027 are consistent with recent assessments, the ABC control rule in the Northeast Multispecies FMP, the International Fisheries Agreement Clarification Act, and the most recent relevant law. Help prevent overfishing and achieve optimum yield.
Measures to manage the commercial fishery – Atlantic cod	Ensure that groundfish stocks are managed consistently with the status of stocks and the requirements of the MSA.
Measures to manage the recreational fishery – Atlantic cod	Ensure that groundfish stocks are managed consistently with the status of stocks and the requirements of the MSA.

4.0 ALTERNATIVES UNDER CONSIDERATION

4.1 Action 1 – Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

4.1.1 Alternative 1 – No Action

Under Alternative 1/No Action, the Northeast Multispecies FMP would not be revised to include the four stock units of Atlantic cod that were accepted by the peer review of the 2023 Atlantic Cod Research Track Stock Assessment. The FMP would continue to include the two stock units of Gulf of Maine (GOM) cod and Georges Bank (GB) cod. Stock assessments are produced for the four cod stock units.

Rationale: This would be inconsistent with the latest peer reviewed scientific information. Stock assessments would be produced using the four approved models that resulted from the Research Track stock assessment rather than the two stocks in the FMP. The new stock assessments would not provide catches at F_{MSY} to form the basis for setting overfishing limits (OFL), acceptable biological catches (ABC) or annual catch limits (ACL) for the existing two Atlantic cod stocks in the FMP. GOM cod and GB cod specifications for fishing year 2026 (beginning May 1, 2026) would need to be set through a separate action. It is not clear whether, or how, the Council would set quotas for the existing GOM and GB cod stocks for future years, beginning with fishing year 2026.

4.1.2 Alternative 2 – Status Quo

The FMP currently includes two Atlantic cod stock units, GOM cod and GB cod. Stock assessments were previously produced for those two stocks, but the 2022 stock assessments were the final assessments produced for the two-cod stock structure. Similar to Alternative 1/No Action, under Alternative 2 the FMP would not be revised to include the four stock units of Atlantic cod that were accepted by the peer review of the Research Track Assessment. Alternative 2 assumes a hypothetical scenario where stock assessments are conducted for the existing two cod stock units of GOM and GB.

Rationale: The status quo is not a viable option because stock assessments are no longer conducted for the GOM cod and GB cod stocks currently included in the FMP. The status quo option exclusively serves as a basis for evaluating the effects of the No Action and revising the cod stock units in the FMP.

4.1.3 Alternative 3 – Revise Atlantic Cod Stock Units in the FMP (*Preferred Alternative*)

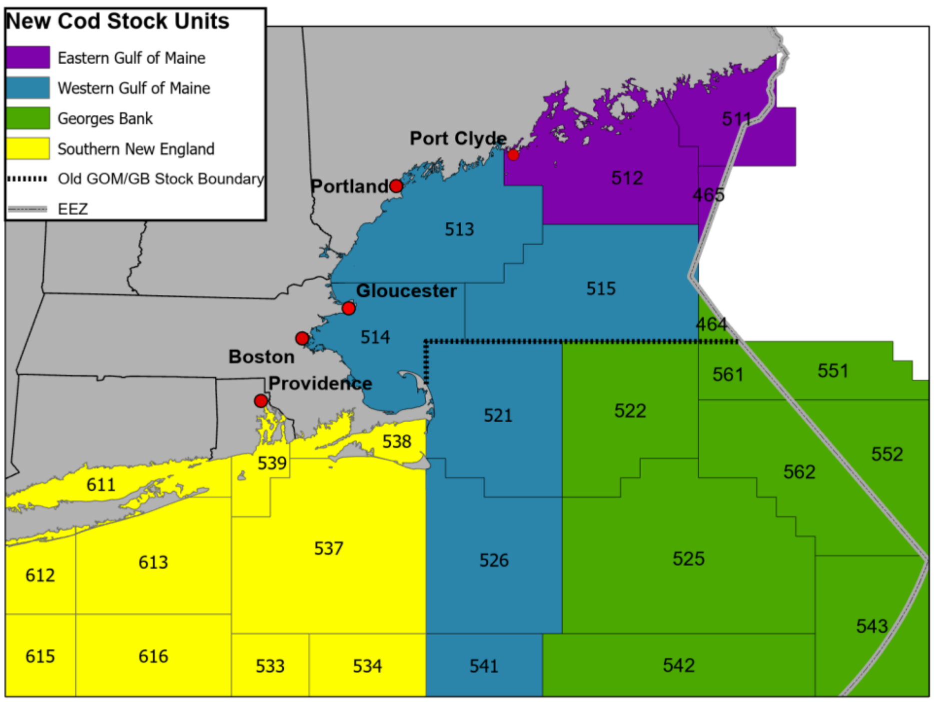
Under Alternative 3, the FMP would be revised to include four stocks of Atlantic cod as defined in the Research Track Stock Assessment:

- New Stock Unit of Eastern Gulf of Maine (EGOM) Cod
- New Stock Unit of Western Gulf of Maine (WGOM) Cod
- Revised Stock Unit of George Bank (GB) Cod
- New Stock Unit of Southern New England (SNE) Cod

Table 2- Statistical reporting areas (SRAs) comprising the stock areas for the four new Atlantic cod stock units, as determined by the 2023 Atlantic Cod Research Track Assessment.

Stock	SRAs
EGOM cod	465, 467, 511, 512
WGOM cod	513, 514, 515, 521, 526, 541
GB cod	464, 522, 525, 542, 543, 551, 552, 561, 562
SNE cod	533, 534, 537, 538, 539, 611, 612, 613, 614, 615, 616, 621, 622, 623, 624, 625, 626, 627, 628, 629, 631, 632, 633, 634, 635, 636, 637, 638, 639

Figure 1- Stock areas for the four new Atlantic cod stock units. Existing GOM/GB stock boundary shown for reference.



Rationale: This is consistent with the latest peer reviewed science and the National Standards of the Magnuson-Stevens Fishery Management and Conservation Act (MSA). The National Standards require a council to prepare an FMP for each fishery under its authority. National Standard 2 requires that conservation and management measures be based on the Best Scientific Information Available (BSIA). Revising the Atlantic cod stock in the FMP would align with the four approved stock assessment models and would allow use of those assessments to set specifications for the four stocks. Revising the Atlantic cod stocks in the FMP will trigger additional requirements under the MSA. Guidelines implementing National Standard 1 (§ 600.310) require setting reference points, including status determination criteria (SDC) for determining whether a stock is overfished or subject to overfishing, ABC, and ACL. SDCs and accountability measures (AMs) would be set for the four cod stocks in Action 2 – Action 5. A future Council action may consider additional changes to management of the cod stock units.

4.2 Action 2 – Atlantic Cod Status Determination Criteria

4.2.1 Alternative 1 - No Action

Under Alternative 1/No Action, status determination criteria (SDCs) would not be adopted for the four Atlantic cod stock units added to the FMP under Amendment 25: Georges Bank (GB) Atlantic cod, Eastern Gulf of Maine (EGOM) Atlantic cod, Western Gulf of Maine (WGOM) Atlantic cod, and Southern New England (SNE) Atlantic cod.

These stocks are being incorporated into the FMP under Amendment 25 based on the latest scientific information following the peer reviewed Atlantic Cod Stock Structure Working Group (ACSSWG) and the Atlantic Cod Research Track Stock Assessment. The Council determined that the stocks of Atlantic cod in the FMP should be revised and that the four new stocks of Atlantic cod are in need of conservation and management. Therefore, measurable and objective SDCs must be specified for these stocks in a way that enables monitoring of the status of each stock.

Rationale: These are new stocks and do not have SDC specified. This alternative provides no measurable and objective SDCs by which to sufficiently monitor the status of each stock as required by National Standard 1 (NS1) guidelines.

4.2.2 Alternative 2 – New Status Determination Criteria for Cod Stocks (*Preferred Alternative*)

Alternative 2 would adopt new SDCs for the four Atlantic cod stock units added to the FMP under Amendment 25: GB Atlantic cod, EGOM Atlantic cod, WGOM Atlantic cod, and SNE Atlantic cod (Table 3). Stock assessment results for the numerical values corresponding to the SDC definitions are provided in Table 4 and these numerical values would be updated in subsequent stock assessments.

The NEFSC conducted management track stock assessments in June 2024 for these newly identified stocks, producing new SDCs and numerical estimates of the SDCs based on peer review recommendations.

Rationale: This option would recognize and set the SDCs for the four new cod stock units identified in the 2024 peer reviewed management track stock assessments, consistent with NS1 guidelines.

Table 3 – Alternative 2 status determination criteria.

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Georges Bank Atlantic cod	SSB_{MSY} proxy	½B_{MSY}	$F_{40\%}$ proxy
Eastern Gulf of Maine Atlantic cod	SSB_{MSY} proxy	½B_{MSY}	$F_{40\%}$ proxy
Western Gulf of Maine Atlantic cod	SSB_{MSY} proxy	½B_{MSY}	$F_{40\%}$ proxy
Southern New England Atlantic cod	SSB_{MSY} proxy	½B_{MSY}	$F_{40\%}$ proxy

Table 4 – Alternative 2 numerical estimates of SDCs (based on the 2024 management track stock assessments).

Stock	Model/Approach	B_{MSY} or Proxy (mt)	F_{MSY} or Proxy	MSY (mt)
Georges Bank Atlantic cod	WHAM	8,290	0.23	1,930
Eastern Gulf of Maine Atlantic Cod	WHAM	2,184	0.27	476
Western Gulf of Maine Atlantic cod	WHAM	62,677	0.19	11,271
Southern New England Atlantic cod	WHAM	11,258	0.12	1,317

4.3 Action 3 – Revised Specifications for Atlantic Cod

4.3.1 Alternative 1 - No Action

Under Alternative 1/No Action, there would be no changes to the specifications for FY2026 and FY2027 (Table 5). The four Atlantic cod stocks (EGOM, WGOM, GB, and SNE) do not have default specifications as these are new stock units in the FMP. As such, there would be no specifications in place in FY2026 for these four stocks.

Rationale: The four cod stocks (EGOM, WGOM, GB, and SNE) do not have specifications set for FY2026 and since these are new stock units to the FMP, do not have default specifications.

Table 5 – Alternative 1/No Action - Northeast Multispecies OFLs, ABC, ACLs, and other ACL sub-components for FY2026-FY2027 (metric tons, live weight), adjusted for final sector 2025 rosters. Stocks in gray do not have specifications for FY2026. Values are rounded to the nearest metric ton or tenth. Underlined stocks are subject to adjustments in 2026 based on US/CA quotas, 2025 CA quotas were used to adjust in the interim.

Stock	FY	OFL	US ABC	State-Waters Sub-Component	Other sub-component	Scallops	Groundfish Sub-ACL	Comm. Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Preliminary Sectors Sub-ACL	Preliminary Non-sector Groundfish Sub-ACL	MWT or Small mesh Sub-ACL	Total ACL
EGOM	2026	No specifications for FY2026											
WGOM Cod	2026	No specifications for FY2026											
<u>GB Cod</u>	2026	No specifications for FY2026											
SNE Cod	2026	No specifications for FY2026											

4.3.2 **Alternative 2 – Revised Specifications (*Preferred Alternative*)**

Under Alternative 2, the annual specifications for FY2026 for GB cod, and FY2026-FY2027 for EGOM cod, WGOM cod, and SNE cod would be as specified in Table 6.

Alternative 2 includes adjustments to the state waters and other sub-component values.

<u>Western Gulf of Maine cod ABC apportionment for FY2026-FY2027</u>

The WGOM cod stock is a new stock unit defined by a sub-set of the statistical areas of the old GOM stock unit (513, 514, and 515) and of the old GB stock unit (521, 526, and 541). Under Phase 1 of the Council's Atlantic Cod Management Transition Plan, the Council chose to maintain existing potential sector contributions (PSCs) for the basis of allocating to the commercial fishery. This necessitates an apportionment of the WGOM cod ABC to the commercial groundfish fishery between the northern portion (statistical areas 513, 514, and 515) and the southern portion (statistical areas 521, 526, and 541). GOM PSCs are applied to the northern WGOM portion, and GB PSCs to the southern WGOM portion.

The WGOM cod ABC would be distributed by using the following methodology, in order:

1. Using the same methodology used in FW 59 to revise the apportionment between commercial and recreational, calculate the proportion of recreational catch to the total catch within the Western Gulf of Maine statistical areas over the fishing years 2001 through 2006 (see Appendix V).
2. The resulting proportion of recreational catch from the total WGOM cod ABC determines the recreational sub-ABC.
3. Set aside a portion of the remaining total WGOM cod ABC to the state and other subcomponents based on the average catch from each subcomponent over the most recent three years.
4. Calculate the proportion of commercial groundfish catch within the northern portion of the WGOM and the southern portion of the WGOM to the total catch within the WGOM statistical areas, respectively, over the fishing years 2010 through 2012, 2017, and 2022 through 2023.
5. Apply each proportional split, north and south, to the remaining WGOM cod ABC (less the recreational sub-ABC and the state and other sub-components) to determine a northern and southern commercial groundfish sub-ABC for WGOM cod respectively.
6. Multiply each resulting northern and southern commercial groundfish sub-ABC by the respective GOM (for northern portion) and GB (for southern portion) sector PSC, and the GOM and GB common pool PSC to calculate northern and southern WGOM cod sector sub-ABCs, and northern and southern WGOM cod common pool sub-ABCs, respectively.
7. Combine the northern and southern sector sub-ABCs to produce one WGOM cod sector sub-ABC, and incorporate a 5% management uncertainty buffer (MUB) to produce one WGOM sector sub-ACL.
8. Combine the northern and southern common pool sub-ABCs and incorporate a 5% MUB to produce one WGOM cod common pool sub-ACL.

Within Alternative 2, the apportionment of the WGOM cod commercial groundfish sub-ABC between the north and south (step 4) is based on an area proportional split of 68% of commercial sub-ABC in the northern portions of the Western Gulf of Maine and 32% of commercial sub-ABC in the southern portions of the Western Gulf of Maine (See Appendix III for background). The resulting pounds are combined to create a WGOM sector sub-ACL (and subsequent ACEs), and common pool sub-ACL as indicated in Table 6, which will apply to the whole of the WGOM stock area.

Rationale: The distribution between the recreational and commercial fisheries (step 1) is consistent with the method used in Amendment 16 and FW59 to calculate recreational and commercial sub-ACLs for the GOM cod stock, based on the proportional amount of recreational and commercial catch from 2001 through 2006. Amendment 16 also established the order of distribution, beginning with the recreational sub-ACL, then the state and other sub-components, with the remaining sub-ABC allocated to the sectors and common pool fishery. The basis for apportioning the commercial groundfish sub-ABC between the north and south in step 3 is to account for differences between the Gulf of Maine and Georges Bank cod stocks, differences in ACLs over the time period, and differences in fishing opportunities, practices, and equities between vessels operating in the north and south portions of the WGOM stock area. The potential for the historical commercial sub-ACL to have an outsized effect on the relative catch in the two old stock areas is minimized by limiting the criteria to fishing years where the commercial sub-ACL of one stock was less than twice the other stock.

Management Uncertainty Buffers for Atlantic Cod Stocks

This alternative would specify the MUB applied to each of the four new cod stocks:

- Set the MUB for recreational sub-ACLs at 7% for WGOM cod and SNE cod.
- Set the MUB for commercial (sector and common pool) sub-ACLs at 5% for all four cod stocks (WGOM, SNE, EGOM, and GB cod), but only for FY2026 for GB cod.
- Maintain the sector MUB of 5% for SNE cod for FY2026 even under a 100% monitoring coverage target.

Rationale: Recreational sub-ACL MUBs and commercial sub-ACL MUBs are set in line with a majority of other stocks managed under the FMP, and account for the inherent uncertainties in quota monitoring, with the exception of GB cod. Though the GB stock is a part of the offshore fishery, for which other stocks that have no shore-side component receive a 3% MUB, there is a higher level of uncertainty due to the revision of its stock structure, and with respect to the assumed Canadian removals as the Transboundary Management Guidance Committee (TMGC) / Steering Committee (SC) did not come to agreement on a shared TAC for this stock for FY2025. The Council would need to revisit the MUB for GB cod in a subsequent management action for future years.

A large portion of the SNE stock area overlaps with the area west of 71 degrees 30 minutes west longitude that is excluded from the sector at-sea monitoring (ASM) coverage requirement. Vessels fishing exclusively west of 71 degrees 30 minutes west longitude on a sector trip are excluded from the requirement to carry an at-sea monitor. Amendment 23 revised the sector ASM program so that in years that the coverage target for the groundfish sector monitoring program is set at 100%, the management uncertainty buffer defaults to zero for the sector sub-ACL for the allocated regulated species stocks, unless through an action the Council specifies a different management uncertainty buffer for a sector sub-ACL when the coverage target is 100%. Given the SNE cod stock area overlaps with the geographical area excluded from the ASM coverage requirement for sector vessels, substantial uncertainty will remain in catch estimates for this stock. Therefore, the Council will not remove the MUB for SNE cod in FY2026, even if the at-sea monitoring coverage target is set to 100% in that year.

Georges Bank Cod

The revised specifications for GB cod for FY2026 (Table 6) are intended to serve as a placeholder, until they can be replaced by future specifications. The U.S./Canada TACs were set for FY2025 only, to be revisited this year. However, the Transboundary Management Guidance Committee meeting is scheduled to occur in October 2025, and therefore FY2026 TMGC recommendations and U.S./Canada TACs are not available. The placeholder specifications use the FY2026 total ABC, as recommended by the SSC in July 2024 (see Appendix I), as the U.S./Canada shared TAC and apply the 2026 country shares (68% Canada / 32% U.S). This results in a total ABC of 331 mt and a U.S. ABC of 106 mt.

Table 6 – Alternative 2 Revised Northeast Multispecies OFLs, ABC, ACLs for FY2026-FY2027 (metric tons, live weight), based on final 2025 sector rosters. Values are rounded to the nearest metric ton or tenth. Underlined stocks are subject to adjustments in 2026 based on US/CA quotas, 2025 CA quotas were used to adjust in the interim. Includes adjustments for state waters component and other sub-components.

Stock	FY	OFL	US ABC	State-Waters Sub-Component	Other sub-component	Scallops	Groundfish Sub-ACL	Comm. Ground-fish Sub-ACL	Rec Ground-fish Sub-ACL	Preliminary Sectors Sub-ACL	Preliminary Non-sector Groundfish Sub-ACL	MWT or Small mesh Sub-ACL	Total ACL
EGOM Cod	2026	50	39	0.2	0.4		37	36.5		35.1	1.4		37
	2027	39	30	0.2	0.3		28	28.1		27.0	1.1		29
WGOM Cod	2026	603	460	23	5.0		407	289.8	118	278.9	10.9		436
	2027	769	586	30	6.4		519	369.2	150	355.3	13.9		555
GB Cod	2026	433	106		8.5		93	92.6		89.4	3.2		101
	2027												
SNE Cod†	2026	47	36	6.1	3.2		25	6.7	18	6.5	0.2		34
	2027	65	36	6.1	3.2		25	6.7	18	6.5	0.2		34

† There is a No Action option for not having a SNE cod recreational sub-ACL (section 4.2.3.1) but would need input from the Committee/Council to know what the specifications would be if the recreational sub-ACL is not created.

Rationale: This measure would adopt new specifications for GB cod (FY2026), and WGOM cod, EGOM cod, and SNE cod (FY2026-FY2027) consistent with the most recent stock assessment information. The U.S. and Canada coordinate management of three management units that overlap the boundary between the two countries on Georges Bank. FY2026 specifications for GB cod, are based on the most recent domestic stock assessment for the U.S. and the 2026 U.S./Canada country shares under the resource sharing agreement. The intent is for this placeholder value to be replaced with updated specifications incorporating 2026 recommendations of the TMGC in a separate action (i.e., Framework 72).

4.3.3 Alternative 3 – Southern New England Cod Recreational Sub-ACL (*Preferred Alternative*)

4.3.3.1 Option 1 – No Action

Under Option 1/No Action, SNE cod recreational catches would be attributed to the state and other sub-components.

Rationale: A portion of the total ABC would be set aside for the state and other fishery subcomponents, including the recreational fishery. If an ACL overage occurs due to excessive catch from the state and other fisheries, including the recreational fishery, the commercial groundfish fishery would be responsible for paying back, pound for pound, the ACL overage. The recreational fishery contributes to the majority of catches of SNE cod, and so under this option the fishery component accounting for most of the catch of this stock would not have an allocation or accountability measures.

4.3.3.2 Option 2 – Set Southern New England Cod Recreational Sub-ACL (*Preferred Option*)

Option 2 would set a recreational sub-ACL for SNE cod. The recreational sub-ACL would be determined using the following approach (see Table 6 for values):

After reducing the ABC to account for an estimate of state and other fisheries catch (excluding recreational catch), distribute the remaining ABC between the recreational and commercial groundfish fisheries, using a proportion of 73.5% recreational and 26.5% commercial.

Rationale: The outcome of the 2024 management track stock assessment and SSC recommendations for SNE cod is a very low FY2026 ABC of 36 mt. There are concerns about attributing recreational catch to the state and other subcomponents, which do not have accountability measures, or renewing the catch target approach that was used for the “old GB cod” stock. Without a recreational sub-ACL, if the ACL is exceeded, the commercial fishery would face accountability measures (pound-for-pound payback) even if the ACL overage is due to recreational fishery catch. The recreational fishery catches the majority of catch of SNE cod. Setting an allocation and accountability measures for the fishery component that accounts for the majority of catches would be expected to result in more control over catch for this stock. This is expected to benefit both the recreational and commercial fisheries by contributing towards rebuilding progress and reducing the risk of overfishing.

Given the very low ABCs for FY2026, available catch is extremely limiting for all participants. The distribution between the recreational and commercial fisheries represents a fair and reasonable balance between the recent average proportional catch between these two fisheries, and the estimated amount of catch that the commercial fishery was expected to achieve in FY2025. The recreational sub-ACL and its distribution allows for a larger portion of the overall ABC to be allocated to the recreational fishery without constraining the commercial fishery to prosecute other stocks and assigns both fisheries the responsibility to reduce their effort and monitor their catch in light of the low ABCs. Further, the allocation sets an initial balance between the recreational and commercial fisheries that the Council anticipates monitoring and revisiting in subsequent years. The recreational/commercial allocation for SNE cod will make it easier in the future to develop measures for the appropriate component in order to control fishing mortality.

4.4 Action 4 – Commercial Fishery Management Measures – Atlantic Cod

4.4.1 Alternative 1 – Common Pool Accountability Measures for Cod Stocks (*Preferred Alternative*)

The Council selected both Option 2 and Option 3.

4.4.1.1 Option 1 – No Action

Under Option 1/No Action, there would be no trimester TAC measures specified for the four revised Atlantic cod stocks. The existing GOM and GB cod trimester TAC distributions and closure areas would not apply. There would therefore be no AMs that would prevent the common pool from exceeding sub-ACLs for any of the cod stocks. Default common pool trip limits would not be updated to reflect the revised cod stock units and would apply to the geographic areas associated with the former two cod stocks. This would mean that trip limits for a given geographic area would apply to multiple cod stocks and cod trip limits would not be stock-specific.

Rationale: This would lead to inefficiencies in the management of the common pool sub-ACL for the four new cod stocks.

4.4.1.2 Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closure Areas for Cod Stocks (*Preferred Option*)

Option 2 would adopt common pool trimester TAC distributions and trimester TAC closure areas for the four revised Atlantic cod stocks.

Trimester TAC Apportionments

The output follows the process outlined in Amendment 16, which specified that subsequent calculations use the most recent five-year period of data available. An adjustment was made for GB cod to ensure no trimester percentages would be set at 0%, and an adjustment was made for EGOM cod to ensure a minimum amount for each trimester.

Stock	Trimester 1	Trimester 2	Trimester 3
EGOM Cod	80%	10%	10%
GB Cod	33%	33%	34%
SNE Cod	36%	31%	33%
WGOM Cod	55%	22%	23%

Trimester TAC Closure Areas

The output follows a similar process outlined in Amendment 16, which determined trimester TAC closure areas as the statistical areas that make up 90% of total commercial catches using the most recent five-year period of data (FY2019-FY2023). These areas would close to common pool fishing once 90% of the trimester TAC for a particular stock has been reached. Closures would apply to all gear types.

Stock	Statistical Areas
EGOM	512
GB	522, 561
SNE	537, 539, 613
WGOM	513, 514, 521

Rationale: These management measures are necessary for the common pool fishery to operate under the new cod stock structure. Trimester TAC distributions and closure areas would be updated to reflect the revised cod stock units. This would mean AMs would be specified to prevent the common pool from exceeding the sub-ACL for any of the revised cod stock units.

4.4.1.3 Option 3 – Common Pool Baseline Trip Limits for Cod Stocks (*Preferred Option*)

Option 3 would establish baseline common pool trip limits for the revised Atlantic cod stock units. Option 3 would also include adjustments to the approaches for determining trip limits for the different common pool permit categories (DAS, Handgear A, Handgear B, and Small Vessel category) for the Atlantic cod stock units.

Baseline Trip Limits

Baseline common pool trip limits for DAS vessels would be established as the following:

EGOM cod	25 lb per DAS/50 lb per trip
WGOM cod	50 lb per DAS/100 lb per trip
GB cod	25 lb per DAS/50 lb per trip
SNE cod	0 lb trip limit/possession prohibition

Handgear A, Handgear B, and Small Vessel Category Limits

Under Option 3, the following approaches would apply for setting and adjusting trip limits for the Atlantic cod stocks units:

The Handgear A (HA) limit would remain tied to the DAS limit (i.e., if the A DAS limit is 50 lb per DAS, then the HA limit would be 50 lb per trip), and the maximum cod trip limit would remain 300 lb.

Handgear B (HB) limit would be set at 25 lb per trip for FY2026, except for stocks with a trip limit at 0 lb. HB limits could be set up to 75 lb per trip.

Small Vessel Category limits continue to include a 300 lb combined trip limit for cod, yellowtail, and haddock. The Small Vessel Category would also continue to be subject to limits for those stocks below 300 lb (i.e. if the A DAS limit for cod is 50 lb per DAS, then Small Vessel Category will have a limit of 50 lb per trip on cod nested within its overall 300 lb limit for the cod, haddock, and yellowtail flounder).

Rationale: These management measures update common pool trip limits to reflect the new cod stock structure. Trip limits would be updated to reflect the revised cod stock units and would apply to the geographic areas defining the four new cod stocks. This would mean that trip limits for a given geographic area would apply to a single cod stock.

4.5 ACTION 5 - RECREATIONAL FISHERY MANAGEMENT MEASURES – ATLANTIC COD

4.5.1 Alternative 1 – Recreational Fishing Measures for Southern New England Cod (*Preferred Alternative*)

4.5.1.1 Option 1 – No Action

Under Option 1/No Action, there would be no limit set for recreational possession of SNE cod. The minimum size for cod outside the geographically defined GOM regulated mesh area would remain 23 inches.

4.5.1.2 Option 2 – Recreational Fishing Measures for Southern New England Cod (*Preferred Option*)

Under Option 2, SNE cod would be zero possession for recreational fishermen (charter/party and private anglers). Given the very low ABC and recreational sub-ACL for FY2025 and FY2026, these are the only measures that would be expected to reduce mortality to stay below the FY2026 SNE cod recreational sub-ACL (section 4.3.3.2) (see Appendix IV). The recreational measures for SNE cod would be in place for the start of FY2026 and would remain in place until changed.

Rationale: These measures were developed to reduce recreational mortality on SNE cod and promote SNE cod stock rebuilding

4.5.2 Alternative 2 – Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks (*Preferred Alternative*)

4.5.2.1 Option 1 – No Action

Option 1/No Action would maintain the regulatory process that the Regional Administrator follows to adjust recreational fishing measures for stocks with recreational sub-ACLs only. Under Action 2, Alternative 2 (4.3.2) and Alternative 3, Option 2 (4.3.3.2), that process would apply to WGOM cod and SNE cod. For Eastern Gulf of Maine cod and Georges Bank cod, the Regional Administrator would not have an established regulatory process for adjusting recreational fishing measures

Rationale: This would require the Council to set recreational measures for these stock areas and additional Council action to revise those measures when necessary.

4.5.2.2 Option 2 – Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod (*Preferred Option*)

Option 2 would establish a temporary regulatory process for the Regional Administrator to adjust recreational fishing measures for Eastern Gulf of Maine (EGOM) cod and Georges Bank (GB) cod for FY2026 only. This is in addition to the regulatory process for the Regional Administrator to adjust recreational fishing measures for stocks with recreational sub-ACLs. After consultation with the Council, the Regional Administrator would set recreational measures for these stocks consistent with the Administrative Procedure Act.

Rationale: Providing a regulatory process for the Regional Administrator to adjust recreational measures for stocks that do not have a recreational sub-ACL (i.e. EGOM and GB cod) allows recreational measures to be consistent across WGOM, EGOM, and GB, if appropriate.

4.6 Considered but Rejected Alternatives

The Council considered but rejected one option in addition to those described above in Section 4.2.2

Western Gulf of Maine cod ABC apportionment for FY2026-FY2027

Within Alternative 2, the apportionment of the WGOM cod commercial sub-ABC between the north and south would be based on an area proportional split of 55% in the northern portions of the Western Gulf of Maine and 45% in the southern portions of the Western Gulf of Maine. The resulting pounds are combined to create a WGOM cod sector sub-ACL (and subsequent ACEs), and a WGOM cod common pool sub-ACL as indicated in Table 6, which could be fished throughout the WGOM area.

Rationale: The WGOM cod commercial sub-ABC is apportioned based on a historical commercial fishery catch analysis that calculated the percentage of catch in the northern and southern portions of WGOM over the fishing years since Amendment 16 was implemented, 2010 through 2023. This apportionment would minimize any disruption to current fishing trends and reflect the current state of ecological dynamics on the water.

Rationale for moving to considered but rejected: The Council felt that using the entire time period (i.e. 2010-2023) did not account for differences in past management measures and quotas in place for the GOM and GB cod stocks, nor the utilization rates by sector and the leasing market that could impact the utilization. The Council therefore recommended a proportional split of 68% of TAC in the northern portions of the Western Gulf of Maine and 32% of TAC in the southern portions of the Western Gulf of Maine, based on the proportion of commercial groundfish catch within the northern and the southern portions of the WGOM in fishing years 2010 through 2012, 2017, and 2022 through 2023. The potential for the historical commercial sub-ACL to have an outsized effect on the relative catch in the two old stock areas is minimized by limiting the criteria to these fishing years where the commercial sub-ACL of one stock was less than twice the other stock (see Section 4.3.2).

5.0 AFFECTED ENVIRONMENT

5.1 INTRODUCTION

The Affected Environment is described in this action based on valued ecosystem components (VECs), including: regulated groundfish species, non-groundfish species/bycatch, the 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 REGULATED GROUNDFISH SPECIES

This section describes the life history and stock population status for each allocated fish stock harvested under the Northeast Multispecies FMP. Further information on life history and habitat characteristics of the stocks managed in this FMP can be found in the EFH Source Documents at http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

The allocated target stocks for the Northeast Multispecies FMP are: EGOM cod, WGOM cod, GB cod, SNE cod, GOM haddock, GB haddock, American Plaice, witch flounder, GOM winter flounder, GB winter flounder, SNE/MA winter flounder, CC/GOM yellowtail flounder, GB yellowtail flounder, SNE/MA yellowtail flounder, redfish, pollock and white hake. These species are discussed in Sections 5.2.1 - 5.2.14.

The Northeast Multispecies FMP also manages Atlantic halibut, ocean pout, windowpane flounder (GB/GOM- northern and SNE/MA- southern stocks), and Atlantic wolffish. While OFLs, ABCs, and ACLs are specified for these stocks, they were not allocated to sectors through Amendment 16. These species are discussed in Sections 5.2.15 - 5.2.19.

Discussions have been adapted from the most recent stock assessment reports (NEFSC 2023a, NEFSC 2023b, NEFSC 2023c, NEFSC 2023, in prep, and NEFSC 2024, in prep).

Additional information following the most recent stock assessments is also provided in Sections 5.2.20 - 5.2.21.

5.2.1 Atlantic cod

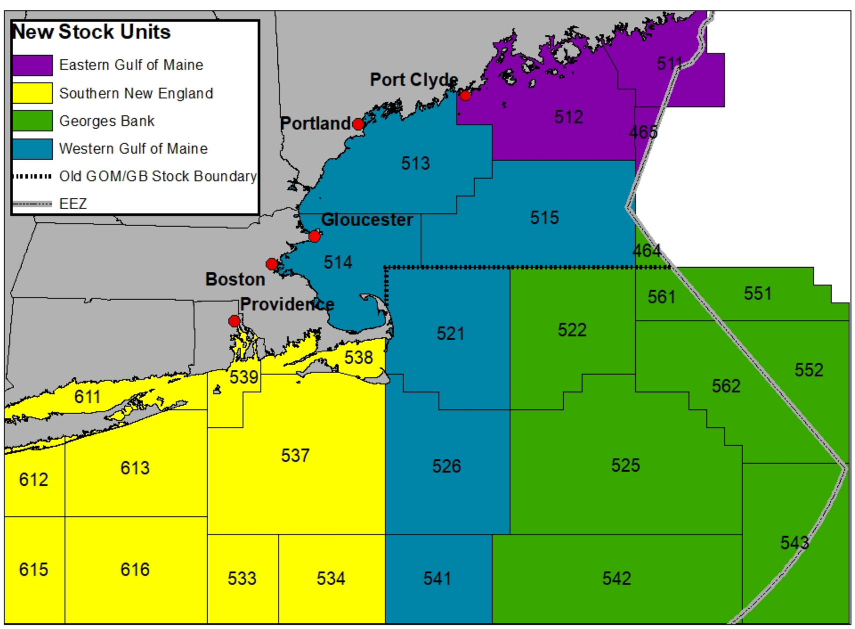
Life History. The Atlantic cod, *Gadus morhua*, is a demersal gadoid species found on both sides of the North Atlantic. In the western North Atlantic, cod occur from Greenland to North Carolina. The greatest concentrations of cod off the U.S. Northeast coast are on rough bottoms 33 - 492 ft (10 - 150 m) deep and at 32 - 50°F (0 - 10°C). Spawning occurs year-round near the ocean bottom in dense aggregations and is typically associated with specific seafloor features. It can peak in the winter and spring and corresponds to 41 - 45°F (5 - 7°C) water. Spawning is delayed until spring when winters are severe, and peaks in the winter when winters are mild. Cod tend to exhibit strong spawning site and season fidelity throughout their range, though with some variation across stocks.

Eggs are pelagic, buoyant, spherical, and transparent. They are released in batches for extended periods up to two months, and drift for 2 - 3 weeks before hatching, though this can vary seasonally. The larvae are pelagic for about three months until reaching 1.6 - 2.3 in (4 - 6 cm), at which point their vertical distribution is associated with prey availability, and their descent to the seafloor is a function of their development, growth rate and ambient water temperature (McBride and Smedbol 2022). Settlement of larval cod to the seafloor typically occurs around 3-5 cm and is most abundance at depths less than 30 meters and bottom temperatures less than 9°C. Most remain on the bottom, and there is no evidence of a subsequent diel vertical migration. Adults tend to move in schools, usually near the bottom, but also occur in the water column (NEFSC 2011c).

Population and Management History. In U.S. waters, prior to 2020, Atlantic cod was assessed and managed as two independent stocks – Gulf of Maine (GOM) cod and Georges Bank cod. The 2020 Atlantic Cod Stock Structure Working Group concluded there are five biological units of cod – Georges Bank, Southern New England, Western Gulf of Maine and Cape Cod winter spawners, Western Gulf of Maine spring spawners, and Eastern Gulf of Maine (McBride and Smedbol, 2022). The 2023 Research Track Assessment developed assessments for four biological cod units – Eastern Gulf of Maine (EGOM), Georges Bank (GB), Southern New England (SNE), and Western Gulf of Maine (WGOM), which serve as the basis of the latest peer reviewed scientific information available on Atlantic cod stock structure to date (Figure 2).

The Council is working on a multi-year effort to transition management of Atlantic cod in response to this new understanding of four cod stock units according to the Atlantic Cod Management Transition Plan. Phase 1 of this transition plan includes revising the Atlantic cod stock units in the Northeast FMP under Amendment 25 and establishing status determination criteria and setting specifications for fishing years 2025 through 2027 under this framework. Modifications to the current management units or management measures for Atlantic cod will be a part of Phase 2 of the transition plan, to occur after final action of Phase 1.

Figure 2 – New stock unit boundaries for the four new Atlantic cod stocks along with the previous GOM/GB stock boundary outlined for reference.



Note: Canadian catch is only included in the GB cod assessment.

Sections 5.2.1.1 - 5.2.1.4 summarize the population status of each new stock definition based on findings from their June 2024 management track assessments which will be used to determine stock status and were used to produce proposed catch levels for the fishery beginning with the 2025 fishing year (see Section 4.1).

5.2.1.1 Eastern Gulf of Maine Cod

Life History. The Eastern Gulf of Maine stock of Atlantic cod is reproductively isolated from the other cod stocks and is self-replenishing particularly within statistical areas 511 and 512.

Population Status. EGOM cod is a new stock unit defined by the most northerly statistical areas of the old GOM management unit (511, 512, and portions of 465, 467) (Figure 2). The stock underwent its first management track assessment in June 2024, concluding that EGOM cod is overfished but overfishing is not occurring (NEFSC 2024, in prep). An official stock status will be determined after status determination criteria are established, which is a part of this action (see Section 4.1). The spawning stock biomass (SSB) is estimated to have been around 3,500 mt in 1981 with a persistent declining trend since then. The stock remains severely low relative to historic levels. The 2023 SSB estimate is 267 mt, which is 12% of the biomass target (NEFSC 2024, in prep). The 2023 fully selected fishing mortality is estimated to be 0.006, which is 2% of the F_{MSY} proxy (NEFSC 2024, in prep). Data from the Catch Accounting and Monitoring System (CAMS) was used for both fishery landings and discards from 2020 to 2023. For discards, more gear types were considered for the June 2024 management track assessment than the previous research track assessment. Lobster pots discard estimates were a new mode of discards to be potentially included in the assessment model, but estimates were ultimately excluded due to their uncertain influence on total fishing mortality (NEFSC 2024, in prep). Research efforts to improve estimation of discards over time in the lobster fishery are ongoing. Additionally, the age composition of the stock is poorly informed due to the lack of biological sampling in the fishery, and recruitment is at an all-time low (NEFSC 2024, in prep).

5.2.1.2 Western Gulf of Maine Cod

Life history. The Western Gulf of Maine (WGOM) stock of Atlantic cod combines two genetically distinct populations with different reproductive seasons, the winter and spring spawners. Winter spawning peaks in November and December, while spring spawning peaks in May and June. Compared to the spring spawners, the winter spawners have a more resident life history, a deeper bodied and shorter head, and grow and mature at a faster rate. Spring spawners will reach a larger maximum size and are the most vulnerable to climate change and warming ocean waters with very little settlement occurring where water temperature exceeds 16°C. Spring-spawned cod larvae are dispersed around Cape Cod to Georges Bank and settle around 90 days after peak spawning while winter-spawned cod larvae are dispersed around Cape Cod to Georges Bank and into Southern New England and settle around 150 days after peak spawning. The two spawning stocks are recognized as having high connectivity and mixing between the two spawner stocks and therefore constitute one larger WGOM stock.

Population Status. WGOM cod is a new stock unit defined by statistical areas of the old GOM management unit (513, 514, and 515), and the old GB management unit (521, 526, and 541). (Figure 2). The stock underwent its first management track assessment in June 2024, concluding that WGOM cod is overfished, and overfishing is occurring. (NEFSC 2024, in prep). An official stock status will be determined after status determination criteria are established, which is a part of this action (see Section 4.1). Spawning stock biomass is estimated to be 1,847 mt in 2023, which is 3% of the biomass target (NEFSC 2024, in prep). The fully selected fishing mortality for 2023 is estimated as 0.31, which is 163% of the F_{MSY} proxy (NEFSC 2024, in prep). Contrary to EGOM cod, CAMS discard data from the lobster fleet from 2020 to 2023 was included in this assessment and showed minimal impact on model results or stock status. The 2024 assessment showed a high sensitivity of the SSB and fishing mortality estimates to the inclusion of the 2023 spring Bottom Longline Survey, the exclusion of which increased terminal SSB by 150% and decreased terminal F by 58% (NEFSC 2024, in prep). The data point was ultimately excluded from the assessment by the Peer Review Panel, with the expectation that additional future survey data will reduce the uncertainty. Ultimately, the stock is in poor condition, with a truncated age structure and the 2024 spring NEFSC bottom trawl survey index being the lowest on record.

5.2.1.3 Georges Bank Cod

Life History. Spawning occurs on Georges Bank from January through April and between 20 and 90 meters. Spawning cod exhibit more dispersion from and less fidelity to their spawning sites. However, the most productive area occurs at the northeast peak of Georges Bank between the U.S. and Canada border. There is minimal movement of cod west towards the Great South Channel and more recruitment of Georges Bank spawned cod within the stock area due to the associated oceanographic circulations.

Population Status. GB cod is a transboundary stock co-managed by the U.S. and Canada. The stock area for GB cod was adjusted in response to the ACSSWG and research track definition and includes statistical areas from the old GB and eastern GB management unit (522, 525, 561, 562, 551, 552, 542, and 543) and statistical area 464 which was previously part of the old GOM management unit (Figure 2). The adjustment to new stock definitions constitutes this as a new GB stock thereby eliciting its first management track assessment under the new stock units in June 2024. The research track peer review also approved an analytical model which was lacking for this stock in previous years. According to the new analytical assessment, this GB cod stock is overfished but overfishing is not occurring (NEFSC 2024, in prep). An official stock status will be determined after status determination criteria are established, which is a part of this action (see Section 4.1) The 2023 SSB is estimated to be 2,668 mt, which is 32% of the biomass target but an all-time low (NEFSC 2024, in prep). The 2023 fully selected fishing mortality is estimated to be 0.13, which is 56% of the F_{MSY} proxy (NEFSC 2024, in prep). The GB cod stock continues to show a truncated age structure with the NEFSC fall bottom trawl survey noting a lack of fish older than age 4 in the last two years of the assessment, while recruitment is a major source of uncertainty for this stock (NEFSC 2024, in prep).

5.2.1.4 Southern New England Cod

Life History. The Southern New England stock of Atlantic cod is currently the most southerly cod stock in the world according to the ACSSWG (McBride and Smedbol 2022). There is limited information on spawning activity for this stock, but they have been found to exhibit strong site fidelity with a persistent aggregation occurring on Cox Ledge. Initial tagging studies have observed most ripe cod samples captured between December and February (McBride and Smedbol 2022). Spawning in this area results in predominantly local settlement of larval and juvenile cod.

Population Status. SNE cod is a new stock unit defined by statistical areas from the old GB management unit (537, 538, 539, 533, 534, 611 through 616, and 621 through 639) (Figure 2). The stock underwent its first management track assessment in June 2024 concluding that the stock is overfished, and overfishing is occurring (NEFSC 2024, in prep). An official stock status will be determined after status determination criteria are established, which is a part of this action (see Section 4.1). Spawning stock biomass is estimated to be 289 mt in 2023, which is 3% of the biomass target (NEFSC 2024, in prep). The 2023 fully selected fishing mortality is estimated to be 0.975, which is 806% of the F_{MSY} proxy (NEFSC 2024, in prep). Changes since the research track included adding CAMS discard data and recreational catch over the time series for the months of January and February, both of which were found to have minimal impact on trends or stock status. The NEFSC spring survey catch rates have failed to catch cod in recent years with the 2023 survey failing to survey the Southern New England area due to vessel maintenance delays. Reduced indices of abundance and the lack of biological samples from the recreational and commercial fishery are important sources of uncertainty (NEFSC 2024, in prep).

5.2.2 Gulf of Maine Haddock

Life History. Haddock, *Melanogrammus aeglefinus*, is a demersal gadoid species found in the North Atlantic Ocean, occurring from Cape May, New Jersey to the Strait of Belle Isle, Newfoundland. Six distinct haddock stocks have been identified, and the two which occur in U.S. waters are associated with Georges Bank and the Gulf of Maine. Haddock are highly fecund broadcast spawners, spawning over various substrates including rocks, gravel, smooth sand, and mud. In the Gulf of Maine, spawning occurs from early February to May, usually peaking in February to April. Haddock release their eggs near the ocean bottom in batches where a courting male then fertilizes them. Fertilized eggs become buoyant and rise to the surface water layer and remain in the water column to development. Larvae metamorphose into juveniles in roughly 30 to 42 days at lengths of 0.8 to 1.1 in (2 - 3 cm). Juveniles initially live in the epipelagic zone and remain in the upper water column for 3 - 5 months, but they visit the seafloor in search of food. They settle into a demersal existence once they locate suitable habitat. Haddock do not make extensive migrations, but prefer deeper waters in the winter and tend to move shoreward in summer. The GOM haddock have lower weights at age than the GB stock and the age at 50% maturity was also lower for GOM haddock than GB haddock (NEFSC 2011c).

Population Status. The GOM haddock stock underwent a Level 3 Management Track assessment in 2024 and is the first management track assessment for this stock since the recommendation to transition from an ASAP to WHAM framework in the 2023 State-Space Research Track assessment (NEFSC 2024, in prep). The 2024 Peer Review Panel concluded that the stock is not overfished and overfishing is not occurring (NEFSC 2024, in prep). This was a change in overfishing determination from the 2022 management track assessment, which indicated the stock was not overfished but overfishing was occurring (NEFSC 2023b). The 2023 SSB was estimated to be at 17,836 mt, which is 194% of the biomass target, and the 2023 fully selected fishing mortality was estimated to be 0.23 which is 68% of the overfishing threshold proxy (NEFSC 2024). The GOM haddock stock has experienced several large recruitment events since 2010; the 2020- and 2021-year classes are strong and have stabilized the downward trend of the stock. However, it is still unclear as to whether these cohorts will experience above or below average survival as the large 2013-year class ages out of the population (NEFSC 2024, in prep).

5.2.3 **Georges Bank Haddock**

Life History. The life history of GB haddock, *Melanogrammus aeglefinus*, is comparable to the GOM haddock (Section 5.2.2). On Georges Bank, spawning occurs from January to June, usually peaking from February to early-April. This is the principal haddock spawning area in the Northeast U.S. Shelf Ecosystem, concentrating on the northeast peak of Georges Bank. Median age and size of maturity differ slightly between the GB and GOM haddock stocks (NEFSC 2011c).

Population Status. The GB haddock stock underwent a Level 2 Management Track assessment in 2024. The 2024 Peer Review Panel concluded that the stock is not overfished, and overfishing is not occurring (NEFSC 2024, in prep). The 2023 SSB was estimated to be 32,730 mt, which is 135% of the biomass target, and the average fishing mortality on ages 5-7 was estimated to be 0.17 which is 65% of the overfishing threshold proxy (NEFSC 2024, in prep). GB haddock shows a broad age structure and has had several strong year classes. Specifically, the 2013-year class is the largest observed for this stock, while the 2020-year class accounts for 47% of the estimated SSB in 2023. However, as the 2013 year-class ages out of the population, the stock's abundance returns to levels last observed in the early 2000s, and its spatial distribution contracts, and it becomes less broadly distributed. The GB haddock stock is a transboundary stock co-managed by the U.S. and Canada, with catches in recent years well below the total quota (U.S. + Canada).

5.2.4 **American Plaice**

Life History. American plaice, *Hippoglossoides platessoides*, is an arctic-boreal to temperate-marine pleuronectid (righteye) flounder that inhabits the continental shelves of the North Atlantic. Off the U.S.

coast, American plaice are managed as a single stock in the Gulf of Maine and Georges Bank regions. American plaice are batch spawners, releasing eggs in batches every few days over the spawning period. Adults spawn and fertilize their eggs at or near the bottom. Buoyant eggs lack oil globules and drift into the upper water column. Eggs hatch at the surface and the time between fertilization and hatching varies with water temperature. Transformation of the larvae and migration of the left eye begins when the larvae are ~0.8 in (20 mm). Dramatic physiological transformations occur during the juvenile stage; the body shape flattens and widens. As the migration of the left eye across the top of the head to the right side reaches completion, descent towards the seafloor begins. In U.S. and Canadian waters, adult American plaice are sedentary, migrating only for spawning and feeding (NEFSC 2011c).

Population Status. The American plaice stock underwent a Level 2 management track assessment in 2024. The 2024 Peer Review Panel concluded the stock is not overfished and overfishing is not occurring (NEFSC 2024, in prep). The 2024 assessment is the first time commercial discards from CAMS have been incorporated for the stock; however, fishery age composition data for 2018 to 2023 was excluded from the assessment due to an unintentional grouping of length samples from the electronic monitoring maximum retention program with portside sampling that biased median length and age, and weight-at-age estimates. The SSB in 2023 was estimated to be 25,248 mt, which is 195% of the biomass target. The 2023 fully selected fishing mortality was estimated to be 0.057, which is 11% of the overfishing threshold proxy (NEFSC 2024, in prep). SSB estimates show an increase over the terminal three years of the assessment, which corresponds to observed increases in the NMFS fall and spring survey indices over the same period.

5.2.5 **Witch Flounder**

Life History. Witch flounder, *Glyptocephalus cynoglossus*, is a demersal flatfish distributed on both sides of the North Atlantic. In the western North Atlantic, the species ranges from Labrador southward and closely associates with mud or sand-mud bottom. In U.S. waters, witch flounder are common throughout the Gulf of Maine, in deeper areas on and adjacent to Georges Bank, and along the shelf edge as far south as Cape Hatteras, North Carolina. Witch flounder is managed as a unit stock. Spawning occurs at or near the bottom; however, the buoyant eggs rise into the water column where subsequent egg and larval development occurs. The pelagic stage of witch flounder is the longest among the species of the family *Pleuronectidae*. Descent to the bottom occurs when metamorphosis is complete, at 4 - 12 months of age. There has been a decrease in both the age and size of sexual maturity in recent years. Witch flounder spawn from March to November, with peak spawning occurring in summer. The general trend is for spawning to occur progressively later from south to north. In the Gulf of Maine-Georges Bank region, spawning occurs from April to November, and peaks from May to August. Spawning occurs in dense aggregations that are associated with areas of cold water. Witch flounder spawn at 32 - 50 °F (0 – 10 °C) (NEFSC 2011c).

Population Status. The witch flounder stock underwent a Level 2 management track assessment in 2024. The assessment concluded that the stock is overfished, but that overfishing status could not be determined analytically due to the lack of biological reference points associated with the area-swept empirical approach. The stock condition has seen some improvement but remains poor relative to historical levels (NEFSC 2024, in prep). Because a stock assessment model framework is lacking, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. Status determination relative to reference points is not possible because reference points cannot be defined. The fishery landings and survey catch by age indicate some expansion of the age structure, though the number of older fish in the population still remains low (NEFSC 2024, in prep). The 2016 benchmark assessment (SARC 62) peer review panel did not accept the analytical assessment models for witch flounder (NEFSC 2017a). However, an informational Age-Structured Assessment Program (ASAP) model was produced as a sensitivity run during the 2024 Management Track Assessment to explore a transition to an analytical model. This model suggests improvements in stock biomass since the 2016 benchmark assessment and that the empirical approach produces appropriate catch advice (NEFSC 2024, in prep).

5.2.6 Gulf of Maine Winter Flounder

Life History. Winter flounder, *Pseudopleuronectes americanus*, is a demersal flatfish distributed in the western North Atlantic from Labrador to the Chesapeake Bay. Important U.S. commercial and recreational fisheries exist from the Gulf of Maine to the Mid-Atlantic Bight. Winter flounder is managed and assessed in U.S. waters as three stocks: Gulf of Maine (GOM), Southern New England/Mid-Atlantic (SNE/MA), and Georges Bank (GB). All three stocks are being assessed within the Winter Flounder Research Track Stock Assessment, which is scheduled for peer review in November 2026. Adult GOM winter flounder migrate inshore in the fall and early winter and spawn in late winter and early spring. Peak spawning occurs in Massachusetts Bay and south of Cape Cod during February and March, and somewhat later along the coast of Maine, continuing into May. After spawning, adults typically leave inshore areas when water temperatures exceed 59°F (15°C), although some remain inshore year-round. Winter flounder eggs are demersal, adhesive, and cluster together. Larvae are initially planktonic, but 5 - 6 weeks after hatching become increasingly bottom-oriented with metamorphosis, as the left eye migrates to the right side of the body and the larvae become "flounder-like." This finishes by the time the larvae are 0.3 - 0.4 in (8 - 9 mm) long at ~8 weeks old. Newly metamorphosed young-of-the-year winter flounder reside in shallow water where individuals may grow to ~4 in (100 mm) within the first year (NEFSC 2011c).

Population Status. The GOM winter flounder stock underwent a Level 2 management track assessment in 2022. The 2022 Peer Review Panel concluded the stock biomass status is unknown and overfishing is not occurring (NEFSC 2023b). The analytic method was rejected in 2008 with GARM (2008) and again at SARC52 (2011). Area swept assessments have been used since then. The stock's size structure has not responded to the large declines in commercial and recreational removals since 2018 nor has it resulted in a change in the survey indices of abundance. The 2022 Peer Review Panel expressed concern about the uncertainty surrounding the rapid increase in catch advice given the stocks depressed condition despite low fishing pressure (Merrick et al 2022).

5.2.7 Georges Bank Winter Flounder

Life History: The life history of Georges Bank (GB) winter flounder, *Pseudopleuronectes americanus*, is comparable to the Gulf of Maine winter flounder life history, which is described in Section 5.2.6. GB winter flounder growth is different than either GOM or SNE winter flounder stocks, with winter flounder on Georges Bank growing larger in size than the inshore stocks of winter flounder.

Population Status: The GB winter flounder stock underwent a management track assessment in 2022. The 2022 Peer Review Panel concluded the stock is not overfished and overfishing is not occurring (Merrick et al 2022). This was a change from the 2020 management track assessment which indicated the stock was overfished and overfishing was not occurring. The retrospective adjusted SSB in 2021 was estimated to be 4,503 mt, which is 60% of the biomass target and retrospective adjusted fully selected fishing mortality was estimated to be 0.0176, which is 17% of the overfishing threshold (NEFSC 2023b). GB winter flounder is in a rebuilding plan with $F_{rebuild}$ rate defined as 70%F_{MSY} with an end date of 2029. Catch weight at age has been increasing for the last few years and there are indications of a better than average recruitment class in 2020 in the Canadian spring survey.

5.2.8 **Southern New England/Mid-Atlantic Winter Flounder**

Life History: The life history of SNE/MA winter flounder, *Pseudopleuronectes americanus*, is comparable to the Gulf of Maine winter flounder life history, which is described in Section 5.2.6.

Population Status: SNE/MA winter flounder underwent a management track assessment in 2022. The 2022 Peer Review Panel concluded the stock is not overfished and overfishing is not occurring (Merrick et al 2022). This was a substantial change in the perceived status of the SNE/MA winter flounder stock, resulting largely from the change in how the reference points were calculated. SNE/MA winter flounder was in a rebuilding plan but is now considered rebuilt. However, recent model estimates and fishery independent survey indices all reveal a poor stock condition with an overall declining trend in SSB over the time series. The 2021 SSB was estimated to be 3,353 mt, which is 101% of the biomass target (NEFSC 2023b), and the fully selected fishing mortality was estimated to be 0.061, which is 23% of the overfishing threshold. The 2022 Peer Review Panel noted recruitment has been declining and is currently very low.

5.2.9 **Cape Cod/Gulf of Maine Yellowtail Flounder**

Life History. The yellowtail flounder, *Limanda ferruginea*, is a demersal flatfish that occurs from Labrador to Chesapeake Bay. NMFS manages three stocks off the U.S. coast including the Cape Cod/Gulf of Maine (CC/GOM), GB, and SNE/MA stocks. All three stocks are being assessed within the Yellowtail Flounder Research Track Stock Assessment which underwent peer review in November 2024. Yellowtail flounder generally inhabits depths between 131 to 230 ft. (40 and 70 m). Spawning occurs in the western North Atlantic from March through August at temperatures of 41 to 54 °F (5 to 12°C), where they spawn buoyant, spherical, pelagic eggs that lack an oil globule. Pelagic larvae are brief residents in the water column with transformation to the juvenile stage occurring at 0.5 to 0.6 in (11.6 to 16 mm) standard length. The median age at maturity varies for each stock. High concentrations of adults occur around Cape Cod in both spring and autumn, and spawning takes place along the northwest continental shelf waters. The median age at maturity for females is 2.6 years.

Population Status: The CC/GOM yellowtail flounder stock underwent a Level 1 management track assessment in 2022. Based on the assessment, the stock is not overfished, and overfishing is not occurring. The retrospective adjusted 2021 SSB was estimated to be 3,058 mt, which is 100% of the biomass target and the fully selected fishing mortality was estimated to be 0.1035, which is 32% of the overfishing threshold proxy (NEFSC 2023b). There has been some moderate expansion in the older age groups, which is also supported by the surveys. The stock is rebuilt as of 2022.

5.2.10 **Georges Bank Yellowtail Flounder**

Life History: The general life history of Georges Bank (GB) yellowtail flounder, *Limanda ferruginea*, is comparable to the CC/GOM yellowtail described in Section 5.2.9. The median age at maturity for females is 1.8 years on Georges Bank.

Population Status: The GB yellowtail flounder stock is a transboundary stock co-managed by the U.S. and Canada. Historically the stock was assessed under the Transboundary Resources Assessment Committee (TRAC). In March 2024, a TRAC Process Improvement Workshop was held in Halifax, Nova Scotia where it was recommended that the management of GB yellowtail flounder be based on scientific advice from the U.S. domestic assessment. As a result, the NEFSC updated the Limiter approach in July 2024 to derive catch advice; the uncertainty of which was reduced due to availability of all three fishery-independent surveys (DFO trawl survey, and NEFSC fall and spring bottom trawl survey), a first since 2019. Recent fishery catches remain below quota while stock biomass and productivity remain poor according to the Limiter approach (NEFSC 2024, in prep). However, due to the empirical nature of the assessment, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. NMFS determined that the stock status for GB yellowtail flounder is overfished, with overfishing status unknown. The stock is in a rebuilding plan with a rebuilding date of 2032.

5.2.11 Southern New England/Mid-Atlantic Yellowtail Flounder

Life History: The general life history of the Southern New England/Mid-Atlantic (SNE/MA) yellowtail flounder, *Limanda ferruginea*, is comparable to the CC/GOM yellowtail described in Section 5.2.9. The median age at maturity for females is 1.6 years in southern New England.

Population Status: The Southern New England/Mid-Atlantic yellowtail flounder stock underwent a Level-2 management track assessment in 2022. The 2022 Peer Review Panel concluded the stock is overfished and overfishing is not occurring (Merrick et al 2022). The retrospective adjusted 2021 spawning stock biomass was estimated to be 70 mt, which is 4% of the biomass target, and the fully selected fishing mortality was estimated to be 0.082, which is 23% of the overfishing threshold proxy (NEFSC 2023b). The stock is in a rebuilding plan with a rebuilding date of 2029. The stock remains at low abundance despite low catches. The long-term outlook for the stock is questionable, and if the Cold Pool Index continues to warm due to global climate change, the ability of the stock to support a fishery is questionable (NEFSC 2023b).

5.2.12 Acadian Redfish

Life History: The Acadian redfish, *Sebastes fasciatus Storer*, and the deepwater redfish, *S. mentella Travin*, are virtually indistinguishable from each other based on external characteristics. Deepwater redfish are less prominent in the more southerly regions of the Scotian Shelf and appear to be virtually absent from the Gulf of Maine, where Acadian redfish appear to be the primary representative of the genus Sebastes. NMFS manages Acadian redfish inhabiting the U.S. waters of the Gulf of Maine and deeper portions of Georges Bank and the Great South Channel as a unit stock. The redfish are a slow growing, long-lived, ovoviviparous species with an extremely low natural mortality rate. Redfish fertilize their eggs internally. The eggs develop into larvae within the oviduct and are released near the end of the yolk sac phase. The release of larvae lasts for 3 to 4 months with a peak in late May to early June. Newly spawned larvae occur in the upper 10 m of the water column: at 0.4 to 1.0 in (10 to 25 mm). The post-larvae descend below the thermocline when about 1 in (25 mm) in length. Young-of-the-year are pelagic until reaching 1.6 to 2.0 in (40 to 50 mm) at 4 to 5 months old. Therefore, young-of-the-year typically move to the bottom by early fall of their first year. Redfish of 9 in (22 cm) or greater are considered adults. In general, the size of landed redfish positively correlates with depth. This may be due to a combination of differential growth rates of stocks, confused species identification, size-specific migration, or gender-specific migration (females are larger). Redfish make diel vertical migrations linked to their primary euphausiid prey.

Population Status: Based on the recommendation of the 2023 Peer Review Panel, redfish is not overfished, and overfishing is not occurring (NEFSC 2023, in prep). Redfish is rebuilt. Concerns were raised in the 2020 management track assessment that the model failed to fit the decrease in the indices of abundance at the end of the time series, while continuing to estimate an increase in SSB over that same period. Several changes to the assessment were explored in this update to improve the fit to the indices. In the final model, application of the Francis (2011) stage 2 multipliers improved the model fit to the indices, which resulted in the estimated SSB leveling off at the end of the time series, rather than continuing to increase, and decreased the retrospective pattern. Lack of age data remains a source of uncertainty, although additional years of age data were included in this assessment update.

5.2.13 **Pollock**

Life History: Pollock, *Pollachius virens*, occur on both sides of the North Atlantic. In the western North Atlantic, the species is most abundant on the western Scotian Shelf and in the Gulf of Maine. There is considerable movement of pollock between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Although some differences in meristic and morphometric characters exist, there are no significant genetic differences among areas. As a result, pollock are assessed as a single unit. The principal pollock spawning sites in the western North Atlantic are in the western Gulf of Maine, Great South Channel, Georges Bank, and on the Scotian Shelf. Spawning takes place from September to April. Spawning time is more variable in northern sites than in southern sites. Spawning occurs over hard, stony, or rocky bottom. Spawning activity begins when the water column cools to near 46 °F (8°C) and peaks when temperatures are approximately 40 to 43 °F (4.5 to 6°C). Thus, most spawning occurs within a comparatively narrow range of temperatures. Pollock eggs are buoyant and rise into the water column after fertilization. The pelagic larval stage lasts for 3 to 4 months. At this time the small juveniles or "harbor pollock" migrate inshore to inhabit rocky subtidal and intertidal zones. Pollock then undergo a series of inshore-offshore movements linked to temperature until near the end of their second year. At this point, the juveniles move offshore where the pollock remain throughout the adult stage. Pollock are a schooling species and occur throughout the water column. With the exception of short migrations due to temperature changes and north-south movements for spawning, adult pollock are fairly stationary in the Gulf of Maine and along the Nova Scotian coast. Male pollock reach sexual maturity at a larger size and older age than females.

Population Status: The pollock stock underwent a Level 3 management track assessment in 2024. The 2024 Peer Review Panel concluded that the stock is not overfished and overfishing is not occurring (NEFSC 2024, in prep). There are two population assessment models brought forward from the 2010 benchmark assessment: the base model (dome-shaped survey selectivity), which is used to provide management advice; and the flat sel sensitivity model (flat-topped survey selectivity), which is included for the sole purpose of demonstrating the sensitivity of assessment results to survey selectivity assumptions. The SSB was estimated to be 180,266 mt under the base model and 124,843 mt under the flat sel sensitivity model, which are 213% and 186% of the biomass target, respectively (NEFSC 2024, in prep). The 2023 age 5 to 7 average fishing mortality was estimated to be 0.061 under the base model and 0.079 under the flat sel sensitivity model, which is 30% and 37% of the overfishing threshold, respectively. Total removals of pollock declined from 2013 to 2015 and have remained constant since. Fishery and survey data suggests the existence of a relatively strong 2019-year class, which has begun to enter the fishery.

5.2.14 **White Hake**

Life History: The white hake, *Urophycis tenuis*, occurs from Newfoundland to southern New England and is common on muddy bottom throughout the Gulf of Maine. The depth distribution of white hake varies by age and season. Juvenile white hake typically occupy shallower areas than adults, but individuals of all ages tend to move inshore or shoalward in summer and disperse to deeper areas in winter. The northern spawning group of white hake spawns in late summer (August-September) in the southern Gulf of St. Lawrence and on the Scotian Shelf. The timing and extent of spawning in the Georges Bank - Middle Atlantic spawning group has not been clearly determined. The eggs, larvae, and early juveniles are pelagic. Older juvenile and adult white hake are demersal. The eggs are buoyant. Pelagic juveniles become demersal at 2.0 to 2.4 in (50 - 60 mm) total length. The pelagic juvenile stage lasts about two months. White hake attain a maximum length of 53 in (135 cm) and weigh up to 49 lbs (22 kg). Female white hake are larger than males (NEFSC 2013b).

Population Status: The white hake stock underwent a Level 3 management track assessment in 2022. The Peer Review Panel concluded the stock is not overfished and overfishing is not occurring (Merrick et al 2022). This is a change from the 2019 operational assessment, in which white hake was overfished. The retrospective adjusted 2021 SSB was estimated to be 19,497 mt, which is 69% of the biomass target, and the 2021 fully selected fishing mortality was estimated to be 0.104, which is 65% of the overfishing threshold proxy (NEFSC 2023b). The stock shows no truncation of age structure. Estimates of commercial landings and discards have decreased over time. The stock is in a rebuilding plan with a rebuilding deadline of 2031 and defines $F_{rebuild}$ as 70%F_{MSY}.

5.2.15 Gulf of Maine/Georges Bank Windowpane Flounder

Life History: Windowpane flounder or sand dab, *Scophthalmus aquosus*, is a left-eyed, flatfish species that occurs in the northwest Atlantic from the Gulf of St. Lawrence to Florida (Collette & Klein-MacPhee 2002). Windowpane prefer sandy or muddy bottom habitats and occur at depths from the high water mark to 656 ft (200 m), with the greatest abundance at depths < 180 ft (55 m), and at temperatures of 32º-80ºF (0º-26.8ºC) (Moore 1947). On Georges Bank, windowpane are most abundant at depths < 60 m during late spring through autumn but overwintering occurs in deeper waters to 366 m (Chang et al. 1999). Windowpane flounders are assessed and managed as two stocks: Gulf of Maine/Georges Bank (GOM/GB or northern) and Southern New England/Mid-Atlantic Bight (SNE/MA or southern) due to habitat differences and relative abundance trends. Windowpane generally reach sexual maturity between ages 3 and 4 (Moore 1947), though males can mature at age 2 (Grosslein & Azarovitz 1982). Age data from the southern stock is limited, however, due to their difficulty to age, which may be due to factors in their environment. On Georges Bank, median length at maturity is nearly the same for males (8.7 in, 22.2 cm) and females (8.9 in, 22.5 cm) (O'Brien et al. 1993). Spawning occurs on Georges Bank at temperatures of 55º- 61ºF (13º-16ºC) (Morse & Able 1995) and occurs at some level for much of the year with peaks in June and September. Eggs incubate for 8 days at 50º-55ºF (10º-13ºC), and eye migration occurs approximately 17- 26 days after hatching (Collette & Klein-MacPhee 2002). During the first year of life, spring-spawned fish have significantly faster growth rates than autumn-spawned fish, which may result in differential natural mortality rates between the two cohorts (Neuman et al. 2001). Windowpane on Georges Bank aggregate in shallow water during summer and early fall and move offshore in the winter and early spring (Grosslein & Azarovitz 1982).

Population Status: Based on the recommendations of the 2023 Peer Review Panel, northern windowpane flounder stock status is unknown (NEFSC 2023, in prep). The NOAA current official status is that the stock is overfished and overfishing is not occurring. Northern windowpane flounder is in a rebuilding plan with an end date of 2029. The rebuilding plan specifies a fishing mortality rate of 70%F_{MSY}. The 2020 Peer Review Panel rejected the AIM model due to a lack of a relationship between the catch and the survey index. The 2023 assessment is based on a survey area swept assessment. Biological reference points are not specified under this approach. Without a F_{MSY} proxy, 70%F_{MSY} cannot be directly calculated.

5.2.16 Southern New England/Mid-Atlantic Windowpane Flounder

Life History: The life history of Southern New-England/Mid-Atlantic Bight (southern) windowpane flounder, *Scophthalmus aquosus*, is comparable to Northern Windowpane Flounder (Section 5.2.15). In Southern New England, median length at maturity is nearly the same for males (8.5 in, 21.5 cm) and females (8.3 in, 21.2 cm) (O'Brien, et al. 1993). Windowpane spawning in the mid-Atlantic peaks in spring and fall (Chang, et al. 1999), though some spawning occurs through much of the year. Even though migrations patterns are unknown, southern windowpane of all sizes are often found in estuaries.

Population Status: Based on the recommendations of the 2023 Peer Review Panel, Southern windowpane flounder is not overfished and overfishing is not occurring (status has not changed from the 2020 assessment) (NEFSC 2023, in prep). Southern windowpane flounder is considered rebuilt as of 2012.

5.2.17 **Ocean Pout**

Life History: Ocean pout, *Zoarces americanus*, is a demersal eel-like species found in the northwest Atlantic from Labrador to Delaware. Ocean pout are most common on sand and gravel bottom (Orach-Meza 1975) at depths of 49-262 ft (15-80 m) and temperatures of 43º-48º F (6º-9º C) (Scott 1982). In US waters, ocean pout are assessed and managed as a unit stock from the Gulf of Maine to Delaware. In the Gulf of Maine, median length at maturity for males and females is 11.9 in (30.3 cm) and 10.3in (26.2 cm), respectively. Median length at maturity for males and females from Southern New England is 12.6 in (31.9 cm) and 12.3in (31.3 cm), respectively (O'Brien, et al. 1993). According to tagging studies conducted in Southern New England, ocean pout appear not to migrate, but do move between different substrates seasonally. In Southern New England-Georges Bank they occupy cooler rocky areas in summer, returning in late fall (Orach-Meza 1975). In the Gulf of Maine, they move out of inshore areas in the late summer and then return in the spring. Spawning occurs between September and October in Southern New England (Olsen & Merriman 1946) and in August and September in Newfoundland (Keats et al. 1985). Adults aggregate in rocky areas prior to spawning. Eggs are internally fertilized (Mercer et al. 1993; Yao & Crim 1995) and females lay egg masses encased in a gelatinous matrix that they then guard during the incubation period of 2.5-3 months (Keats, et al. 1985). Ocean pout hatch as juveniles on the bottom and are believed to remain there throughout their lives (Methven & Brown 1991; Yao & Crim 1995).

Population Status: The ocean pout stock underwent a Level 1 management track assessment in 2022. Based on the 2022 assessment, ocean pout is overfished but overfishing is not occurring. The 2021 biomass proxy was estimated to be 0.263 kg/tow which is 5% of the biomass target (NEFSC 2023b). The stock is not rebuilding as expected, despite low catch. Discards comprise most of the catch since the no possession regulation was implemented in May 2010. The NEFSC survey indices remain at near-record low levels; there are few large fish in the population. The ocean pout stock remains in poor condition (NEFSC 2023b).

5.2.18 **Atlantic Halibut**

Life History: Atlantic halibut, *Hippoglossus hippoglossus*, is the largest species of flatfish in the northwest Atlantic Ocean. This long-lived, late-maturing flatfish is distributed from Labrador to southern New England (Collette & Klein-MacPhee 2002). They prefer sand, gravel, or clay substrates at depths up to 1,000 m (Miller et al. 1991; Scott & Scott 1988). Along the coastal Gulf of Maine, halibut move to deeper water in winter and shallower water in summer (Collette & Klein-MacPhee 2002). Atlantic halibut reach sexual maturity between 5 to 15 years and the median female age of maturity in the Gulf of Maine-Georges Bank region is 7 years (Sigourney et al. 2006). In general, Atlantic halibut spawn once per year in synchronous groups during late winter through early spring (Neilson et al. 1993) and females can produce up to 7 million eggs per year depending on size (Haug & Gulliksen 1988). Spawning is believed to occur in waters of the upper continental slope at depths below 200 m (Scott & Scott 1988). Halibut eggs are buoyant but drift suspended at water depths of 54 - 90 m (Taning 1936). Incubation times are 13 - 20 days depending on temperature (Blaxter et al. 1983); how long halibut live in the plankton after hatching is not known.

Population Status: The Atlantic halibut stock underwent a Level 1 management track assessment in 2024. Halibut is assessed using a data-poor method (First Second Derivative (FSD) model), as such projections are not possible and biological reference points are unknown. Catch advice for halibut is derived by multiplying the recent catch by the rate of change in three indices (NEFSC fall survey, trawl D:K, gillnet D:K). The stock is likely depleted relative to its virgin biomass based on estimates of historical landings, which were much higher than current landings. The catch multiplier estimated in the FSD model has been less than one for four years, which would be consistent with recent overfishing (NEFSC 2024, in prep). There is no way to determine stock status without reference points; however, NMFS determined that the stock status for Atlantic halibut is overfished, with overfishing status unknown. Halibut is currently in a rebuilding plan with an end date of 2056.

5.2.19 Atlantic Wolffish

Life History: Atlantic wolffish, *Anarhichas lupus*, is a benthic fish distributed on both sides of the North Atlantic Ocean. In the northwest Atlantic, the species occurs from Davis Straits off of Greenland to Cape Cod and sometimes in southern New England and New Jersey waters (Collette & Klein-MacPhee 2002). In the Georges Bank-Gulf of Maine region, abundance is highest in the southwestern portion at depths of 263 - 394 ft (80 - 120 m), but wolffish are also found in waters from 131 - 787 ft (40 - 240 m) (Nelson & Ross 1992) and at temperatures of 29.7º - 50.4º F (-1.3º - 10.2º C) (Collette & Klein-MacPhee 2002). They prefer complex benthic habitats with large stones and rocks (Pavlov & Novikov 1993). Atlantic wolffish are mostly sedentary and solitary, except during mating season. There is some evidence of a weak seasonal shift in depth between shallow water in spring and deeper water in fall (Nelson & Ross 1992). Most individuals mature by age 5-6 when they reach ~18.5 in (47 cm) total length (Nelson & Ross 1992; Templeman 1986). Peak spawning is believed to occur from September to October for Gulf of Maine-Georges Bank wolffish (Collette & Klein-MacPhee 2002), though laboratory studies have shown that wolffish can spawn most of the year (Pavlov & Moksness 1994). Eggs are laid in masses, and males are thought to brood for several months. Incubation time is dependent on water temperature and may be 3 - 9 months. Larvae and early juveniles are pelagic between 20 - 40 mm TL, with settlement between 25 and 30 mm TL (Collette & Klein-MacPhee 2002).

Population Status: The Atlantic wolffish stock underwent a Level-1 management track assessment in 2022. Based on the 2022 assessment, wolffish is overfished but overfishing is not occurring. The 2021 SSB was estimated to be 690 mt which is 46% of the biomass target, and the 2021 fully selected fishing mortality was estimated to be 0.004 which is 2% of the overfishing threshold proxy (NEFSC 2023b). Wolffish is in a rebuilding plan but the end date is not defined. Catch has been limited almost exclusively to discards since the implementation of the no possession rule in May 2010. No age-1 recruits have been caught in the NEFSC spring survey since 2005.

5.2.20 Summary of Stock Status

Table 7 summarizes the status of the northeast groundfish stocks as determined by NOAA Fisheries, noting which groundfish stocks are overfished or are experiencing overfishing.

Table 7 – Current status of groundfish stocks, determined by NOAA Fisheries.

	Status	
Stock	Overfishing?	Overfished?
Georges Bank Cod*	No	Yes
Southern New England Cod*	Yes	Yes
Western Gulf of Maine Cod*	Yes	Yes
Eastern Gulf of Maine Cod*	No	Yes
Georges Bank Haddock	No	No
Gulf of Maine Haddock	No	No
Georges Bank Yellowtail Flounder	Unknown	Yes
Southern New England/Mid-Atlantic Yellowtail Flounder	No	Yes
Cape Cod/Gulf of Maine Yellowtail Flounder	No	No
American Plaice	No	No
Witch Flounder	Unknown	Yes
Georges Bank Winter Flounder	No	No
Gulf of Maine Winter Flounder	No	Unknown

Stock	Status Overfishing?	Overfished?
Southern New England/Mid-Atlantic Winter Flounder	No	No
Acadian Redfish	No	No
White Hake	No	No
Pollock	No	No
Northern Windowpane Flounder	No	Yes
Southern Windowpane Flounder	No	No
Ocean Pout	No	Yes
Atlantic Halibut	Unknown	Yes
Atlantic Wolffish	No	Yes

*Stock status from 2024 management track assessment, determination by NOAA Fisheries pending

Table 8 provides the status determination criteria (SDC) and Table 9 summarizes the updated numerical estimates of the SDCs for all groundfish stocks, based on most resent assessment – either the 2022, 2023, or 2024 management track assessments. The MSA requires that every fishery management plan specify "objective and measurable criteria for identifying when the fishery to which the plan applies is overfished." Guidance on this requirement identifies two elements that must be specified: a maximum fishing mortality threshold (or reasonable proxy) and a minimum stock size threshold.

The MSA also requires that FMPs specify the maximum sustainable yield and optimum yield for the fishery. The Northeast Fisheries Science Center (NEFSC) conducted assessments for 11 groundfish stocks in 2024. The peer review recommended updated numerical values are provided in Table 9.

Table 8 – Current status determination criteria.

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Georges Bank Cod*	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Southern New England Cod *	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Western Gulf of Maine Cod*	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Eastern Gulf of Maine Cod*	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Haddock	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Haddock	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Yellowtail Flounder	Unknown	Unknown	Unknown
Southern New England/Mid-Atlantic Yellowtail Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Cape Cod/Gulf of Maine Yellowtail Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
American Plaice	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Witch Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Winter Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Gulf of Maine Winter Flounder	Unknown	Unknown	F40% MSP
Southern New England/Mid-Atlantic Winter Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Acadian Redfish	SSBMSY: SSB/R (50% MSP)	½ Btarget	F50% MSP
White Hake	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Pollock	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Northern Windowpane Flounder	External	½ Btarget	Rel F at replacement
Southern Windowpane Flounder	External	½ Btarget	Rel F at replacement
Ocean Pout	External	½ Btarget	Rel F at replacement
Atlantic Halibut	Internal	½ Btarget	$F_{0.1}$
Atlantic Wolffish	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP

*As proposed in this action (see Section 4.1).

Table 9 – Current numerical estimates of Status Determination Criteria, based on 2022, 2023, or 2024 assessments.

Stock	Model/ Approach	B_{MSY} or Proxy (mt)	F_{MSY} or Proxy	MSY (mt)
Georges Bank Cod*	WHAM	8,290	0.233	1,930
Southern New England Cod*	WHAM	11,258	0.121	1,317
Western Gulf of Maine Cod*	WHAM	62,677	0.19	11,271
Eastern Gulf of Maine Cod*	WHAM	2,184	0.27	476
Georges Bank Haddock	WHAM	24,225	0.26	5,766
Gulf of Maine Haddock	WHAM	9,185	0.32	2,045
Georges Bank Yellowtail Flounder	empirical index-based	NA	NA	NA
Southern New England/Mid-Atlantic Yellowtail Flounder	ASAP	1,715	0.349	461
Cape Cod/Gulf of Maine Yellowtail Flounder	VPA	3,068	0.32	1,008
American Plaice	WHAM	12,963	0.519	5,090
Witch Flounder	empirical area swept	NA	NA	NA
Georges Bank Winter Flounder	VPA	7,503	0.452	2,757
Gulf of Maine Winter Flounder	empirical area swept	NA	0.23 (exploitation rate)	NA
Southern New England/Mid-Atlantic Winter Flounder	ASAP	3,314	0.265	1,025
Acadian Redfish	ASAP	200,586	0.037	6,825
White Hake	ASAP	28,191	0.1605	4,186
Pollock	ASAP	84,446	0.205	10,370

Stock	Model/ Approach	B_{MSY} or Proxy (mt)	F_{MSY} or Proxy	MSY (mt)
Northern Windowpane Flounder	empirical area swept	NA	NA	NA
Southern Windowpane Flounder	AIM	0.250 kg/tow	1.333 catch/survey index	333
Ocean Pout	exploitation ratio	4.94 kg/tow	0.76 catch/survey index	3,754
Atlantic Halibut	FSD	NA	NA	NA
Atlantic Wolffish	SCALE	1,509	0.192	211

*As proposed in this action (see Section 4.1).

5.2.21 Rebuilding Plan Status for Groundfish Stocks in Formal Rebuilding Plans

Table 10 summarizes the rebuilding status for each groundfish stock in a formal rebuilding plan.

Table 10 – Summary of rebuilding status for groundfish stocks in a formal rebuilding plan based on the most recent assessment in 2022, 2023, or 2024.

Groundfish Stock	Rebuilding Plan Start of the Current Plan	Planned Rebuilding Date	Years Remaining in Plan, starting with FY2024	Total ACLs exceeded within past three completed FYs? *If yes, identify the FYs.*	Has the original rebuilding F been achieved? Or is this unknown? *Indicate the current F estimate relative to F rebuild at the start of the plan.*	What is current SSB estimate relative to SSBMSY? Or is this unknown?
Georges Bank cod*	5/1/2004	2026	3	Yes [120.7% of the total ACL in FY2023]	Unknown	Unknown
Gulf of Maine cod*	Original rebuilding plan 5/1/2014; Revised rebuilding plan 8/18/2023	2033	10	No	$F_{rebuild}$ (plan start) = 0.104 (M=0.2 model) and 0.105 (M-ramp model) $F_{2019full}$ = 0.249 (M=0.2 model with retrospective adjustment) and 0.172 (M-ramp model)	SSB_{2019} = 1,969 mt (M=0.2 model with retrospective adjustment) and 3,223 mt (M-ramp model) 5% and 5%, respectively of SSB_{MSY} proxy 39,912 mt (M=0.2 model) and 60,010

Groundfish Stock	Rebuilding Plan Start of the Current Plan	Planned Rebuilding Date	Years Remaining in Plan, starting with FY2024	Total ACLs exceeded within past three completed FYs? *If yes, identify the FYs.*	Has the original rebuilding F been achieved? Or is this unknown? *Indicate the current F estimate relative to F rebuild at the start of the plan.*	What is current SSB estimate relative to SSBMSY? Or is this unknown?
						mt (M-ramp model)
Georges Bank yellowtail flounder	11/22/2006	2032	9	No	Unknown	Unknown
Southern New England/Mid-Atlantic yellowtail flounder	7/18/2019	2029	6	No	$F_{rebuild}$ (plan start) = 0.243 F_{2021} = 0.349	SSB_{2021} = 70 mt 4% of SSB_{MSY}
Witch Flounder	7/18/2019	2043	20	No	Yes, $F_{rebuild}$ is the exploitation rate from reference years (2007-2015), currently 5.4% Exploitation Rate in 2023 = 3.4%	Unknown
Georges Bank winter flounder	7/18/2019	2029	6	No	$F_{rebuild}$ (plan start) = 0.365 F2021 = 0.076	SSB_{2021} = 4,503 mt 60% SSB_{MSY}
White hake	5/1/2004	2031	8	No	$F_{rebuild}$ (plan start) = 0.117 $F_{2021full}$ = 0.1605	SSB_{2018} = 19,497 mt 69% of SSB_{MSY}
Northern windowpane flounder	7/18/2019	2029	6	No	Unknown	Unknown
Ocean pout	7/18/2019	2029	6	No	Yes, $F_{rebuild}$ is 70%F_{MSY} = 0.532 0.234 in 2021, which is 31% of	0.263 kg/tow in 2021, which is 5% of 4.94 kg/tow (SSB_{MSY})

Groundfish Stock	Rebuilding Plan Start of the Current Plan	Planned Rebuilding Date	Years Remaining in Plan, starting with FY2024	Total ACLs exceeded within past three completed FYs? *If yes, identify the FYs.*	Has the original rebuilding F been achieved? Or is this unknown? *Indicate the current F estimate relative to F rebuild at the start of the plan.*	What is current SSB estimate relative to SSBMSY? Or is this unknown?
					0.76 (F_{MSY} proxy)	
Atlantic halibut	5/1/2004	2055	32	No	Unknown	Unknown
Atlantic wolffish	5/1/2010	Undefined	n/a	No	n/a 0.004 in 2021 which is 2% of 0.192 (F_{MSY} proxy)	690 mt in 2021, which is 46% of 1,509 mt (SSB_{MSY})

*Stocks no longer in the FMP – replaced by revised Atlantic cod stock units (see section 5.2.1)

5.3 Non-Groundfish Species

The following are non-groundfish species routinely caught by the commercial groundfish fishery.

5.3.1 Spiny Dogfish

Life History. Spiny dogfish, *Squalus acanthias*, occurs in the northwest Atlantic from Labrador to Florida. Spiny dogfish is considered to be a unit stock in the northwest Atlantic. In summer, dogfish migrate northward to the Gulf of Maine-Georges Bank region and into Canadian waters. They return southward in autumn and winter. Recent research has suggested that migratory patterns may be more complex (Carlson et al. 2014). Spiny dogfish tend to school by size and, when mature, by sex. The species bears live young, with a gestation period of 18 – 22 months, and produce 2 - 15 pups (average of 6). Size at maturity for females has declined from around 80 cm in 1998 to 73 cm during 2012-2019 (Sosebee 2022).

Population and Management Status. The NEFMC and MAFMC jointly manage the spiny dogfish FMP for federal waters and the Atlantic States Marine Fisheries Commission (ASMFC) has a state waters plan. Spawning stock biomass of spiny dogfish declined rapidly in response to a directed fishery during the 1990s. NFMS initially implemented management measures adopted by the Councils for spiny dogfish in 2001. These measures have been effective in reducing landings and fishing mortality. NMFS declared the spiny dogfish stock rebuilt for the purposes of federal management in May 2010 (TRAC 2010) and a directed fishery resumed. Spiny dogfish underwent a research track assessment in 2022, where a new model was recommended for use for status determination and fishery management advice. As of the 2023 management track assessment, the stock was not overfished and overfishing was not occurring, a change from 2022 due to reduced catch compared to the terminal year in the previous assessment (NEFSC 2023).

Both biomass and catches have declined in recent years, resulting in a 55% reduction in the ABC in 2023 compared to 2022.

5.3.2 **Skates**

Life History. There are seven species in the Northeast Region skate complex: little skate (*Leucoraja erinacea*), winter skate (*L. ocellata*), barndoor skate (*Dipturus laevis*), thorny skate (*Amblyraja radiata*), smooth skate (*Malacoraja senta*), clearnose skate (*Raja eglanteria*), and rosette skate (*L. garmani*). Barndoor skate is the most common skate in the Gulf of Maine, on Georges Bank, and in southern New England. Georges Bank and southern New England is the center of distribution for little and winter skates in the Northeast Region. Thorny and smooth skates typically occur in the Gulf of Maine. Clearnose and rosette skates have a more southern distribution and occur primarily in southern New England and the Chesapeake Bight. Skates are not known to undertake large-scale migrations but move seasonally with changing water temperature; they move offshore in summer and early autumn and then return inshore during winter and spring. Skates lay eggs enclosed in a hard, leathery case commonly called a mermaid's purse. Incubation time is 6 - 12 months, with the young having the adult form at the time of hatching. Catches of these species are largely interrelated with the NE multispecies, monkfish, and scallop fisheries (NEFSC 2011c).

Population and Management Status. NMFS implemented the Northeast Skate Complex Fishery Management Plan (Skate FMP) in September 2003. The FMP required both dealers and vessels to report skate landings by species. Framework Adjustment 2 modified the VTR and dealer reporting codes to further improve species specific landing reports. Possession prohibitions of barndoor, thorny, and smooth skates in the Gulf of Maine were also provisions of the FMP. The FMP implemented a trip limit of 10,000 lbs. (4,536 kg) for winter skate and required fishermen to obtain a Letter of Authorization to exceed trip limits for the little skate bait fishery. In 2010, Amendment 3 to the Skate FMP implemented a rebuilding plan for smooth skate and established an ACL and annual catch target for the skate complex, total allowable landings for the skate wing and bait fisheries, and seasonal quotas for the bait fishery. Possession limits were reduced, in-season possession limit triggers were implemented, as well as other measures to improve management of the skate fisheries. Due to insufficient information about the population dynamics of skates, there remains considerable uncertainty about the status of skate stocks. Based on the 2023 management track assessment, one skate species remains overfished (thorny) and overfishing is occurring for winter skate and little skate. Thorny skate is in a rebuilding plan with a rebuilding deadline of 2028; however, the survey biomass has continued to have no significant signs of rebuilding (NEFMC 2023). Recent skate landings have fluctuated between approximately 30 and 45 million pounds. The landings and catch limits proposed by Amendment 3 have an acceptable probability of promoting biomass growth and achieving the rebuilding (biomass) targets for thorny skates. A stabilization of total catch below the median relative exploitation ratio should cause skate biomass and future yield to increase.

5.3.3 **Monkfish**

Life History. Monkfish, *Lophius americanus*, (i.e., "goosefish"), occur in the western North Atlantic from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Monkfish occur from inshore areas to depths of at least 2,953 ft (900 m). Monkfish undergo seasonal onshore-offshore migrations, which may relate to spawning or possibly to food availability. Female monkfish begin to mature at age 4 with 50% of females maturing by age 5 (~17 in [43 cm]). Males generally mature at slightly younger ages and smaller sizes (50% maturity at age 4.2 or 14 in [36 cm]). Spawning takes place from spring through early autumn. It progresses from south to north, with most spawning occurring during the spring and early summer. Females lay a buoyant egg raft or veil that can be as large as 39 ft (12 m) long and 5 ft (1.5 m) wide, and only a few mm thick. The larvae hatch after 1 - 3 weeks, depending on water temperature. The larvae and juveniles spend several months in a pelagic phase before settling to a benthic existence at a size of ~3 in (8 cm; NEFSC 2011c).

Population and Management Status. NMFS implemented the Monkfish FMP in 1999 (NEFMC 1998) and the fishery is jointly managed by the NEFMC and MAFMC. The FMP included measures to stop overfishing and rebuild the stocks through a number of measures. These measures included:

- Limiting the number of vessels with access to the fishery and allocating DAS to those vessels;
- Setting trip limits for vessels fishing for monkfish; minimum fish size limits;
- Gear restrictions;
- Mandatory time out of the fishery during the spawning season; and
- A framework adjustment process.

The Monkfish FMP defines two management areas for monkfish (northern and southern), divided roughly by an east-west line bisecting Georges Bank. Management track assessments for the northern and southern areas were conducted in 2022 and changed the status of both stocks to unknown from not subject to overfishing and not overfished (NEFSC 2023b). Monkfish abundance in the north is relatively high and is likely to remain so, while abundance in the Southern area seems low and is also likely to remain so, if not continue to decline (NEFSC 2023b). In the north, landings and catch have fluctuated around a steady level since 2009, but increased after 2015, with discards increasing steadily over the same time period. In the south, landings have been declining since 2011 whereas total catch increased until 2020 due to discarding of a strong 2015-year class. Discards peaked in 2017-2019 but remain high compared to historic levels (NEFSC 2023b).

5.3.4 Summer Flounder

Life History. Summer flounder, *Paralichthys dentatus*, occur most commonly in the western North Atlantic from the southern Gulf of Maine to South Carolina. Summer flounder are concentrated in bays and estuaries from late spring though early autumn, when an offshore migration to the outer continental shelf is undertaken. Spawning occurs during autumn and early winter, and the larvae are transported toward coastal areas by prevailing water currents. Development of post larvae and juveniles occurs primarily within bays and estuarine areas. Most fish are sexually mature by age 2. The largest fish are females, which can attain lengths over 90 cm (36 in) and weights up to 11.8 kg (26 lbs.; NEFSC 2011c). Recent NEFSC trawl survey data indicate that while female summer flounder grow faster (reaching a larger size at the same age), the sexes attain about the same maximum age (currently age 15 at 56 cm for males, and age 14 at 76 cm for females). Unsexed commercial fishery samples currently indicate a maximum age of 20 for a 57 cm fish (NEFSC 2019b).

Population and Management Status. The FMP was developed by the MAFMC in 1988, and scup and black sea bass were later incorporated into the FMP. Amendment 2, implemented in 1993, established a commercial quota allocated to the states, a recreational harvest limit, minimum size limits, gear restrictions, permit and reporting requirements, and an annual review process to establish specifications for the coming fishing year. In 1999, Amendment 12 revised the overfishing definitions for all three species, established rebuilding programs, addressed bycatch and habitat issues and established a framework adjustment procedure for the FMP to allow for a streamlined process for relatively minor changes to management measures. Results from the 2023 Management Track Assessment indicate that the summer flounder stock is not overfished, and overfishing is occurring, a change from the 2021 Assessment (NEFSC 2023c). The estimated SSB in 2022 was 40,994 mt, which is 83% of the updated biomass target reference point of 49,561 mt. Fully selected fishing mortality was estimated to be 0.464 in 2022, which is 103% of the overfishing threshold proxy (NEFSC 2023c).

5.3.5 **American Lobster**

Life History. American lobster, *Homarus americanus*, occurs in continental shelf waters from Maine to North Carolina. There are two biological stock units: the Gulf of Maine/Georges Bank stock, and Southern New England stock. The American lobster is long-lived and known to reach more than 40 pounds in body weight (Wolff 1978). Lobsters are encased in a hard exoskeleton that is periodically cast off (molted) for growth and mating to occur. Eggs are carried under the female's abdomen during a 9- to 11-month incubation period. Larger lobsters produce eggs with greater energy content and thus, may produce larvae with higher survival rates (Attard & Hudon 1987). Seasonal timing of egg extrusion and larval hatching is somewhat variable among areas and may also vary due to seasonal weather patterns. Hatching tends to occur over a five-month period from May – September, occurring earlier and over a longer period in the southern part of the range. The pelagic larvae molt four times before they resemble adults and settle to the bottom. Lobsters molt more than 20 times over 5 - 8 years before they reach the minimum legal harvest size.

Population and Management Status. The states, in cooperation with NMFS, manage the American lobster resource through the ASMFC under the provisions of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). States have jurisdiction for implementing measures in state waters, while NMFS implements complementary regulations in federal waters. Results of the 2020 benchmark stock assessment showed a mixed picture, with increasing abundance in the GOM/GBK stock and a sharp decline in abundance for the SNE stock to record low levels. In particular, the SNE stock is considered significantly depleted but overfishing is not occurring; the GOM/GBK unit is not depleted, and overfishing is not occurring, though abundances of young-of-year in the GOM/GBK stock have been neutral to negative since the 2015 assessment (ASMFC 2020).

Over the last four decades, landings in the lobster fishery have exponentially increased, with 41.1 million pounds landed in 1982 and 147.6 million pounds landed in 2018 (ASMFC 2020). In recent years, landings in the Gulf of Maine/Georges Bank (GOM/GB) have declined marginally and still come predominantly from inshore, state waters but are increasingly shifting into nearshore federal waters. Southern New England (SNE) landings have continued to decline and are increasingly coming from offshore federal waters. Total landings have been historically skewed toward the GOM/GB stock area, and the proportional landings from the SNE stock have shifted from approximately 30% to less than 10%[1]. Updates to survey index data have been conducted annually based on a recommendation from the 2020 stock assessment to monitor changes in stock abundance. The most recent update noted that Gulf of Maine indicators for recruits and adults show declines from time series highs, while YOY indicators are low but show some improvement; Georges Bank indicators show slight improvement, though updates only included data through 2022; and Southern New England indicators show continued unfavorable conditions with some further signs of decline[2]. In Lobster Conservation Management Area 3, which corresponds with the offshore areas of the stock, the data indicates a shift in effort and landings to the Gulf of Maine/Georges Bank portion.

5.3.6 **Whiting (Silver Hake)**

Life History. Silver hake, also known as whiting, *Merluccius bilinearis*, range primarily from Newfoundland to South Carolina. Silver hake are fast swimmers with sharp teeth and are important fish predators that also feed heavily on crustaceans and squid (Lock & Packer 2004). In U.S. waters, two stocks have been identified based on differences of head and fin lengths (Almeida 1987), otolith

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[1] American Lobster Management Board Summer Meeting Presentations — August 2024

[2] American Lobster Technical Committee Data Update — October 2024

morphometrics (Bolles & Begg 2000), otolith growth differences, and seasonal distribution patterns (Lock & Packer 2004). The northern silver hake stock inhabits the Gulf of Maine - Northern Georges Bank waters, and the southern silver hake stock inhabits Southern Georges Bank - Middle Atlantic Bight waters. Silver hake migrate in response to seasonal changes in water temperatures, moving toward shallow, warmer waters in the spring. They spawn in these shallow waters during late spring and early summer and then return to deeper waters in the autumn (Brodziak et al. 2001). The older, larger silver hake especially prefer deeper waters. During the summer, portions of both stocks can be found on Georges Bank, whereas during the winter fish in the northern stock move to deep basins in the Gulf of Maine, while fish in the southern stock move to outer continental shelf and slope waters. Silver hake are widely distributed and have been observed at temperature ranges of 2-17° C (36-63° F) and depth ranges of 11-500 m (36-1,640 ft). However, they are most commonly found between 7-10º C (45-50º F) (Lock & Packer 2004).

Population and Management Status. Due to their abundance and availability, silver hake have supported important U.S. and Canadian fisheries as well as distant-water fleets. Landings increased to 137,000 mt in 1973 and then declined sharply with increased restrictions on distant-water fleet effort and implementation of the Magnuson Fishery Conservation and Management Act (MFCMA) in 1977. U.S. landings during 1987-1996 were relatively stable, averaging 16,000 mt per year, but have gradually declined to a historic low of 6,035 mt in fishing year 2017. The small-mesh otter trawl remains the principal gear used in the U.S. fishery, and recreational catches have been low since 1985. Fishing in the Gulf of Maine and Georges Bank regulated mesh areas are managed via six exemption areas, each having specific specifications for gear, possession limits for incidental species, and boundaries (see NEFMC 2017 for details). In the northern management area, all but the Cultivator Shoals Area require vessels to use a more selective raised footrope trawl when using small-mesh trawls.

Silver hake are managed under the NEFMC's Northeast Multispecies FMP ("non-regulated multispecies" category). In 2000, the NEFMC implemented Amendment 12 to this FMP, and placed silver hake into the “small mesh multispecies” management unit, along with red hake and offshore hake. This amendment established retention limits based on net mesh size, adopted overfishing definitions for northern and southern stocks, identified essential fish habitat for all life stages, and set requirements for fishing gear (NEFMC 2000). As of the last assessment in 2023, silver hake is not overfished, and overfishing is not occurring for either the northern or southern stock (NEFSC 2023). Biomass of the northern stock has increased while commercial catch has declined in recent years, and trends indicate that the stock is in good condition (NEFSC 2023). The southern stock has also seen a decline in commercial catch, but biomass has remained stable in recent years (NEFSC 2023). The Council’s proposed 2024-2026 annual catch specifications increase the ABC for northern silver hake by 100% and decrease the ABC by 51% for southern whiting (southern silver hake and offshore hake) from 2021-2023 levels to reflect the updated fall bottom trawl survey stock biomass estimates and prevent overfishing from occurring on southern silver hake.

5.3.7 **Loligo Squid**

Life History. Longfin inshore squid (*Doryteuthis (Amerigo) pealeii*) are distributed primarily in continental shelf waters located between Newfoundland and the Gulf of Venezuela (Cohen 1976; Roper et al. 1984). In the northwest Atlantic Ocean, longfin squid are most abundant in the waters between Georges Bank and Cape Hatteras where the species is commercially exploited. The management unit is all longfin squid under U.S. jurisdiction (i.e. U.S. east coast). Distribution varies seasonally. North of Cape Hatteras, squid migrate offshore during autumn to overwinter in warmer waters along the shelf edge and slope and then return inshore during the spring where they remain until late autumn (Jacobson 2005). The species lives for 6-8 months, grows rapidly, and spawns year-round with peaks during late spring and autumn. Individuals hatched in summer grow more rapidly than those hatched in winter and males grow faster and attain larger sizes than females (Brodziak & Macy III 1996).

Population and Management Status. The longfin squid stock was last assessed in 2023 using the same methodologies from previous assessments and updated with 2022 commercial catches, q-adjusted, swept area biomass estimates, and exploitation indices. The stock is not overfished but overfishing is unknown due to a lack of fishing mortality reference points (NEFSC 2023). The domestic fishery occurs primarily in Southern New England and Mid-Atlantic waters, but some fishing also occurs along the edge of Georges Bank. Fishing patterns reflect seasonal distribution patterns and effort is generally directed offshore during October through April and inshore during May through September. The fishery is dominated by small-mesh otter trawlers, but some near-shore pound net and fish trap fisheries occur during spring and summer. Summer or winter landings may dominate in any given year. The stock is managed by the MAFMC under the Atlantic Mackerel, Squid, and Butterfish FMP. Management measures include annual TACs, which have been partitioned into 3 four-month seasonal trimesters since 2007. There is a moratorium on directed and incidental fishery permits (an open access permit with a low trip limit may still be acquired for free). A minimum codend mesh size of 2 1/8 inches applies from September-April and 1 7/8 inches from May-August. The fishery can also be closed if butterfish discards exceed a discard cap (via in-season monitoring). Longfin inshore squid is undergoing a Research Track Assessment with a peer review scheduled for early 2026 and a Management Track Assessment shortly thereafter.

5.3.8 **Atlantic Sea Scallops**

Life History. Sea scallops, *Placopecten magellanicus,* are distributed in the northwest Atlantic Ocean from Newfoundland to North Carolina, mainly on sand and gravel sediments where bottom temperatures remain below 20º C (68º F). North of Cape Cod, concentrations generally occur in shallow water <40 m (22 fathoms) deep. South of Cape Cod and on Georges Bank, sea scallops typically occur at depths 25 - 200 m (14 - 110 fathoms), with commercial concentrations generally 35 - 100 m (19 - 55 fathoms). Sea scallops are filter feeders, feeding primarily on phytoplankton, but also on microzooplankton and detritus (Hart & Chute 2004). Sea scallops grow rapidly during the first several years of life. Between ages 3 and 5, they commonly increase 50 - 80% in shell height and quadruple their meat weight. Sea scallops have been known to live more than 20 years. They usually become sexually mature at age 2, but individuals younger than age 4 probably contribute little to total egg production. Sexes are separate and fertilization is external. Spawning usually occurs in late summer and early autumn; spring spawning may also occur, especially in the Mid-Atlantic Bight. Sea scallops are highly fecund; a single large female can release hundreds of millions of eggs annually. The larvae remain in the water column for four to seven weeks before settling to the bottom. Sea scallops attain commercial size at about four to five years old, though historically, three-year-olds were often exploited. Sea scallops have a somewhat uncommon combination of life-history attributes: low mobility, rapid growth, and low natural mortality (NEFSC 2011c).

Population and Management Status. The NEFMC established the Scallop FMP in 1982. The commercial fishery for sea scallops is conducted year-round, primarily using New Bedford style and turtle deflector scallop dredges. A small percentage of the fishery employs otter trawls, mostly in the Mid-Atlantic. The principal U.S. commercial fisheries are in the Mid-Atlantic (from Virginia to Long Island, New York) and on Georges Bank and neighboring areas, such as the Great South Channel and Nantucket Shoals. There is also a small, primarily inshore fishery for sea scallops in the Gulf of Maine. The scallop resource was last assessed through a management track assessment in 2020, and it was not overfished, and overfishing was not occurring (NEFSC 2020). Survey biomass estimates in 2022 were the lowest since 1999 but were projected to increase between 2023 and 2024, driven by the continued growth of scallops on Georges Bank. However, biomass in 2023 remains low compared to the peak biomass estimated in 2017. The Atlantic Sea Scallop Research Track Assessment is currently underway and scheduled for peer review in April 2025.

5.3.9 **Scup**

Life History. Scup are found in a variety of habitats in the Mid-Atlantic. Essential fish habitat (EFH) for scup includes demersal waters, areas with sandy or muddy bottoms, mussel beds, and sea grass beds from the Gulf of Maine through Cape Hatteras, North Carolina. Scup undertake extensive seasonal migrations between coastal and offshore waters. They are mostly found in estuaries and coastal waters during the spring and summer. In the fall and winter, they move offshore and to the south, to outer continental shelf waters south of New Jersey. Scup spawn once annually over weedy or sandy areas, mostly off southern New England. Spawning takes place from May through August and usually peaks in June and July (Steimle et al. 1999). About 50% of scup are sexually mature at two years of age and about 17 cm (about 7 inches) total length. Nearly all scup older than three years of age are sexually mature. Scup reach a maximum age of at least 14 years. They may live as long as 20 years; however, few scup older than age 7 are caught in the Mid-Atlantic (DPSWG 2009, NEFSC 2015).

Population and Management Status. The scup fishery is cooperatively managed by the MAFMC and the ASMFC under the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP). The primary commercial fishery management measure is a quota that is distributed to three trimester periods and to individual states. Other federal regulations include minimum mesh size, gear restricted areas, and a minimum fish size. States typically restrict harvest to their quota using seasons and trip limits. Scup were under a formal rebuilding plan from 2005 through 2009. NMFS declared the scup stock rebuilt in 2009 based on the findings of the Data Poor Stocks Working Group (DPSWG 2009). The most recent stock assessment update indicates that scup was not overfished, and overfishing was not occurring in 2022, relative to the updated biological reference points (NEFSC 2023c). SSB has declined since its peak in 2017 but remains very high. Estimated SSB in 2022 was 193,087 mt, which is 246% of the biomass target of 78,593 mt. The fishing mortality rate in 2022 was 0.098, which is 52% of the overfishing threshold proxy ($F_{MSY\ PROXY}$ = F40%) of 0.19. Recent changes in growth, maturity, and recruitment trends have occurred and may be environmentally mediated but the mechanisms are unknown (NEFSC 2023c).

5.3.10 **Atlantic Herring**

Life History. Atlantic herring is widely distributed in continental shelf waters of the Northeast Atlantic, from Labrador to Cape Hatteras. Herring is in every major estuary from the northern Gulf of Maine to the Chesapeake Bay. They are most abundant north of Cape Cod and become increasingly scarce south of New Jersey (Kelly & Moring 1986). Spawning occurs in the summer and fall, starting earlier along the eastern Maine coast and southwest Nova Scotia (August – September) than in the southwestern GOM (early to mid-October in the Jeffreys Ledge area) and GB (as late as November - December; Reid et al. 1999). In general, GOM herring migrate from summer feeding grounds along the Maine coast and on GB to SNE/MA areas during winter, with larger individuals tending to migrate farther distances. Atlantic herring play an important role as forage in the Northeast U.S. shelf ecosystem. They are eaten by a wide variety of fish, marine mammals, birds, and (historically) by humans in the region.

Population and Management Status. The Atlantic herring fishery is cooperatively managed by both the NEFMC and ASMFC. Presently, herring from the GOM (inshore) and GB (offshore) stock components are combined for assessment purposes into a single coastal stock complex. The fishery uses quotas by area and season. Prosecuted primarily by mid-water trawls (single and paired), purse seines, and to a lesser degree, bottom trawls. Management measures include restrictions on the incidental catch of haddock and other regulated groundfish. Mid-water trawls are allowed access to the groundfish closed areas as an exempted fishery, but their use of the areas is subject to numerous regulatory restrictions. The Atlantic herring stock underwent a Management Track assessment in 2024. The stock is overfished, and overfishing is not occurring (NEFSC 2024). The 2023 SSB was estimated to be 47,955 mt, which is 26% of the biomass target, and the average fishing mortality rate for ages 7-8 was estimated to be 0.263 which is 58% of the overfishing threshold proxy. Continued poor recruitment is the main issue driving stock status. Management decisions that reduced US catches had the effect of avoiding overfishing (NEFSC 2023). Proposed catch limits are significantly lower for 2025-2027 compared to previous specification packages (2023-2025). Based on the current assessment projections, the proposed catch limit for 2025 would be reduced by 85% compared to the previous specifications package. The Atlantic Herring Research Track Assessment is currently underway and scheduled for peer review in March 2025.

5.3.11 **Bycatch**

The MSA defines bycatch as fish which are harvested in a fishery, but which are not sold or kept for personal use, including economic discards and regulatory discards. Fish released alive under a recreational catch and release fishery management program are not included. The MSA requires that, to the extent practicable, bycatch and the mortality of bycatch that cannot be avoided should both be minimized. To consider whether these objectives are being met, bycatch must be reported and assessed. To this end, the MSA requires that a standardized reporting methodology assess the amount and type of bycatch occurring in a fishery. The primary tools used to report bycatch in the multispecies fishery are the Vessel Trip Report system (VTR), the NEFSC Observer Program (NEFOP), and the groundfish sector At-Sea Monitoring Program (ASM). Each federally permitted groundfish vessel is required to report discards and landings on every trip from each statistical area they fish in. The sea sampling/observer program places personnel on boats to observe and estimate the amount of discards on a haul-by-haul basis. More information on bycatch may be found at: http://www.greateratlantic.fisheries.noaa.gov/

5.4 ASSEMBLAGES OF FISH SPECIES

Georges Bank and the Gulf of Maine have historically had high levels of fish production. Several studies have identified demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. The study identified depth and salinity as major physical influences explaining assemblage structure. Table 11 compares the six assemblages identified in Gabriel (1992) with the five assemblages from Overholtz and Tyler (1985). This EA considers these assemblages and relationships to be relatively consistent. Therefore, these descriptions generally describe the affected area. The assemblages include allocated target species, as well as non-allocated target species and bycatch. The terminology and definitions of habitat types in Table 11 vary slightly between the two studies. For further information on fish habitat relationships, see Table 12.

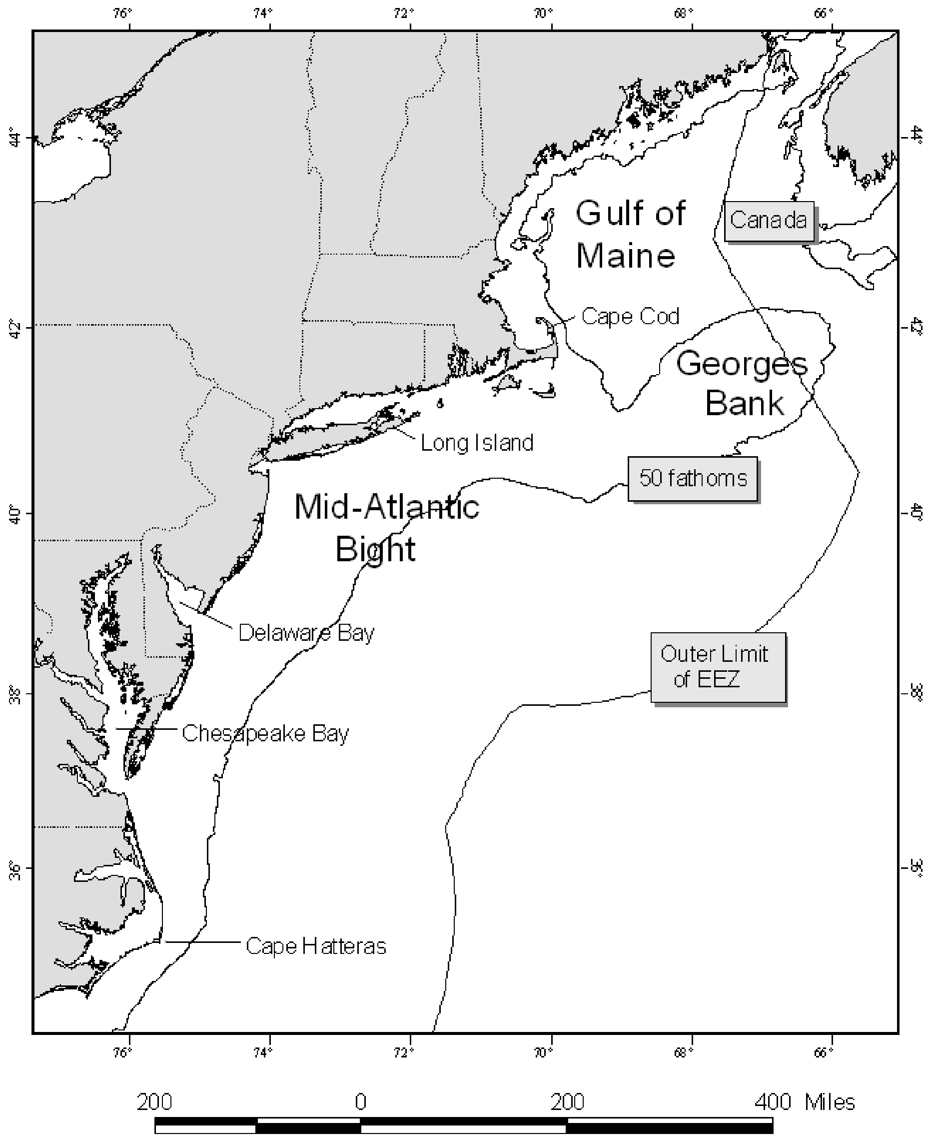
Table 11 – Comparison of Demersal Fish Assemblages of Georges Bank and the Gulf of Maine.

Overholtz and Tyler (1985)		Gabriel (1992)	
Assemblage	Species	Species	Assemblage
Slope and Canyon	offshore hake, blackbelly rosefish, Gulf stream flounder, fourspot flounder, goosefish, silver hake, white hake, red hake	offshore hake, blackbelly rosefish, Gulf stream flounder, fawn cusk-eel, longfin hake, armored sea robin	Deepwater
Intermediate	silver hake, red hake, goosefish, Atlantic cod, haddock, ocean pout, yellowtail flounder, winter skate, little skate, sea raven, longhorn sculpin	silver hake, red hake, goosefish, northern shortfin squid, spiny dogfish, cusk	Combination of Deepwater Gulf of Maine/Georges Bank and Gulf of Maine-Georges Bank Transition
Shallow	Atlantic cod, haddock, pollock, silver hake, white hake, red hake, goosefish, ocean pout	Atlantic cod, haddock, pollock	Gulf of Maine-Georges Bank Transition Zone
	yellowtail flounder, windowpane, winter flounder, winter skate, little skate, longhorn sculpin, summer flounder, sea raven, sand lance	yellowtail flounder, windowpane, winter flounder, winter skate, little skate, longhorn sculpin	Shallow Water Georges Bank-southern New England
Gulf of Maine-Deep	white hake, American plaice, witch flounder, thorny skate, silver hake, Atlantic cod, haddock, cusk, Atlantic wolffish	white hake, American plaice, witch flounder, thorny skate, redfish	Deepwater Gulf of Maine-Georges Bank
Northeast Peak	Atlantic cod, haddock, pollock, ocean pout, winter flounder, white hake, thorny skate, longhorn sculpin	Atlantic cod, haddock, pollock	Gulf of Maine-Georges Bank Transition Zone

5.5 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Large Marine Ecosystem (Map 1) 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 (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 6,500 ft (2,000 m). Four distinct sub-regions are identified, including the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The groundfish fishery primarily occurs in the inshore and offshore waters of the Gulf of Maine, Georges Bank, and the Southern New England/Mid-Atlantic areas. Therefore, the description of the physical environment focuses on these sub-regions. The distinctive features of Southern New England are included in the sections describing Georges Bank and the Mid-Atlantic Bight.

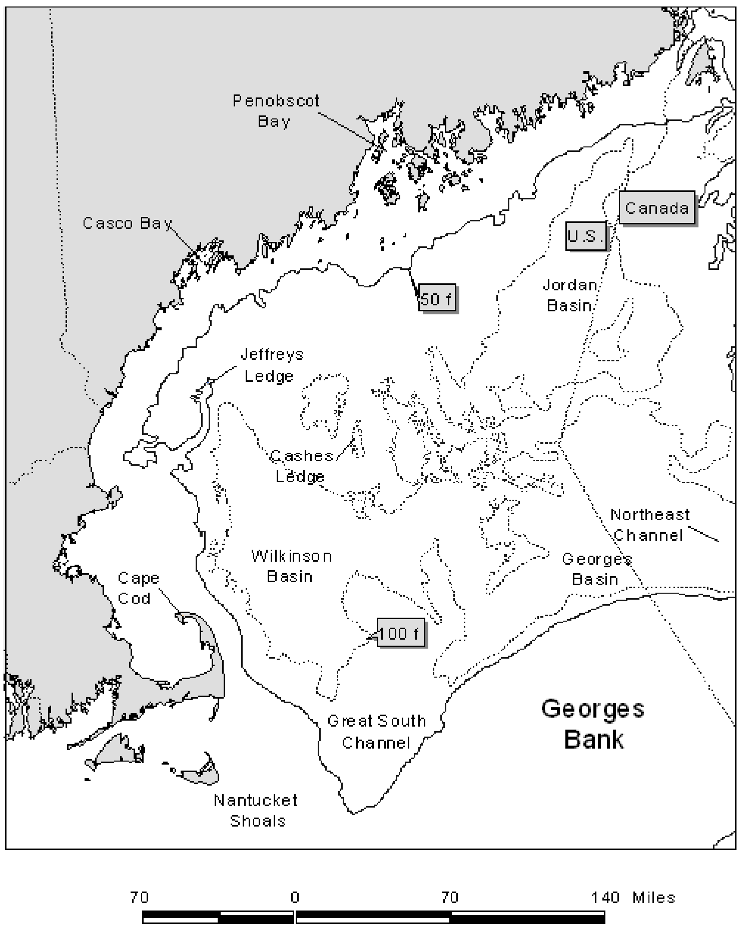
Map 1 – Northeast U.S. Shelf Large Marine Ecosystem. Source: Stevenson et al. (2004).



5.5.1 **Gulf of Maine**

The Gulf of Maine is an enclosed coastal sea, glacially derived, bounded on the east by Browns Bank, on the north by the Nova Scotia (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Map 2). The Gulf of Maine is a boreal environment characterized by relatively cold waters and deep basins, with a patchwork of various sediment types, topographically diverse from the rest of the continental border along the U.S. Atlantic coast. There are 21 distinct basins separated by ridges, banks, and swells. Depths in the basins exceed 800 ft. (250 m), with a maximum depth of 1,150 ft (350 m) in Georges Basin, just north of Georges Bank. High points within the Gulf of Maine include irregular ridges, such as Cashes Ledge, which peaks at 30 ft (9 m) below the surface.

Map 2 – Gulf of Maine. Source: Stevenson et al. (2004).



Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. In the basins, these mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains, although localized rocky features are present, for example in Jordan Basin (see the Council's Deep-Sea Coral Amendment). In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel,[3] sometimes

[3] The term "gravel," as used in this analysis, is a collective term that includes granules, pebbles, cobbles, and boulders in order of increasing size. Therefore, the term "gravel" refers to particles larger than sand and generally denotes a variety of "hard bottom" substrates.

with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a water depth of about 197 ft. (60 m). Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Gravel is most abundant at depths of 65 - 130 ft. (20 - 40 m), except off eastern Maine where a gravel-covered plain exists to depths of at least 325 ft. (100 m). Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches (Stevenson, et al. 2004). Stellwagen Bank offshore Massachusetts includes large areas of sand sediment, in addition to gravel sediments and boulder ridges (Valentine et al. 2005, Valentine and Gallea 2015).

The geologic features of the Gulf of Maine, coupled with the vertical variation in water properties (e.g., salinity, depth, temperature), provide a great diversity of habitat types that support a rich biological community. A brief description of benthic invertebrates and demersal (i.e., bottom-dwelling) fish that occupy the Gulf of Maine is provided below. Additional information is provided in Stevenson et al. (2004), which is incorporated by reference.

The most common groups of benthic invertebrates in the Gulf of Maine reported by Theroux and Wigley (1998) in terms of numbers collected were annelid worms, bivalve mollusks, and amphipod crustaceans. Bivalves, sea cucumbers, sand dollars, annelids, and sea anemones dominated biomass. Watling (1998) identified seven different bottom assemblages that occur on the following habitat types:

1. Sandy offshore banks: fauna are characteristically sand dwellers with an abundant interstitial component;
2. Rocky offshore ledges: fauna are predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers;
3. Shallow [<197 ft. (60 m)] temperate bottoms with mixed substrate: fauna population is rich and diverse, primarily comprised of polychaetes and crustaceans;
4. Primarily fine muds at depths of 197 - 459 ft. (60 - 140 m) within cold Gulf of Maine Intermediate Water[4]: fauna are dominated by polychaetes, shrimp, and cerianthid anemones;
5. Cold deep water, muddy bottom: fauna include species with wide temperature tolerances which are sparsely distributed, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthids also present;
6. Deep basin, muddy bottom, overlaying water usually 45 - 46°F (7 - 8°C): fauna densities are not high, dominated by brittle stars and sea pens, and sporadically by tube-making amphipods; and
7. Upper slope, mixed sediment of either fine muds or mixture of mud and gravel, water temperatures always >46°F (8°C): upper slope fauna extending into the Northeast Channel.

Two studies (Gabriel 1992; Overholtz & Tyler 1985) reported common[5] demersal fish species by assemblages in the Gulf of Maine and Georges Bank:

- Deepwater/Slope and Canyon: offshore hake, blackbelly rosefish, Gulf stream flounder;
- Intermediate/Combination of Deepwater Gulf of Maine-Georges Bank and Gulf of Maine-Georges Bank Transition: silver hake, red hake, goosefish (monkfish);
- Shallow/Gulf of Maine-Georges Bank Transition Zone: Atlantic cod, haddock, pollock;

[4] Maine Intermediate Water is described as a mid-depth layer of water that preserves winter salinity and temperatures, and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western GOM.

[5] Other species were listed as found in these assemblages, but only the species common to both studies are listed.

- Shallow water Georges Bank-southern New England: yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin;
- Deepwater Gulf of Maine-Georges Bank: white hake, American plaice, witch flounder, thorny skate; and
- Northeast Peak/Gulf of Maine-Georges Bank Transition: Atlantic cod, haddock, pollock.

5.5.2 **Georges Bank**

Georges Bank is a shallow (10 - 495 ft. [3 - 150 m depth]), elongated (100 mi.(160 km) wide by 20 mi (320 km) long) extension of the continental shelf that was formed during the Wisconsinian glacial episode (Map 1). It has a steep slope on its northern edge, a broad, flat, gently sloping southern flank, and steep submarine canyons on its eastern and southeastern edges. It has highly productive, well-mixed waters and strong currents. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. Erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents may reduce the amount of sand and cause an overall coarsening of the bottom sediments (Valentine & Lough 1991).

Bottom topography on eastern Georges Bank consists of linear ridges in the western shoal areas; a relatively smooth, gently dipping seafloor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement; and steeper and smoother topography incised by submarine canyons on the southeastern margin. The central region of Georges Bank is shallow, and the bottom has shoals and troughs, with sand dunes superimposed within. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of Georges Bank. Currents in these areas are strongest where water depth is shallower than 165 ft. (50 m). Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm-generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity.

Oceanographic frontal systems separate the water masses of the Gulf of Maine and Georges Bank from oceanic waters south of Georges Bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities. These differences influence productivity and may influence fish abundance and distribution.

Georges Bank has historically had high levels of both phytoplankton and fish production. Common demersal fish species in Georges Bank are offshore hake, blackbelly rosefish, Gulf Stream flounder, silver hake, red hake, goosefish (monkfish), Atlantic cod, haddock, pollock, yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin, white hake, American plaice, witch flounder, and thorny skate. In terms of benthic invertebrates, the most common groups in terms of numbers collected were amphipod crustaceans and annelid worms, while sand dollars and bivalves dominated the overall biomass (Theroux & Wigley 1998). Using Theroux and Wigley database, Theroux and Grosslein (1987) identified four macrobenthic invertebrate assemblages that occur on similar habitat type:

1. The Western Basin assemblage is found in comparatively deep water (490 - 655 ft. [150 - 200 m]) with relatively slow currents and fine bottom sediments of silt, clay, and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers.
2. The Northeast Peak assemblage is found in variable depths and current strength and includes coarse sediments, consisting mainly of gravel and coarse sand with interspersed boulders, cobbles, and pebbles. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and

tubiferous annelids) or free-living (brittle stars, crustaceans, and polychaetes), with a characteristic absence of burrowing forms.

3. The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of Georges Bank in depths <330 ft. (100 m). Medium-grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large with burrowing or motile habits. Sand dollars are most characteristic of this assemblage.
4. The Southern Georges Bank assemblage is found on the southern and southwestern flanks at depths from 260 - 655 ft. (80 - 200 m), where fine-grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids, and starfish.

5.5.3 **Southern New England/Mid-Atlantic Bight**

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Map 1). The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. It generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight consists of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to 60 - 125 ft (100 - 200 km) offshore, where it transforms to the slope (330 - 655 ft. [100 - 200 m]) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson, et al. 2004). Like the rest of the continental shelf, sea level fluctuations during past ice ages largely shaped the topography of the Mid-Atlantic Bight. Since that time, currents and waves have modified this basic structure.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of sand-shell and sand-gravel. Silty sand, silt, and clay predominate on the slope. Permanent sand ridges occur in groups with heights of about 33 ft. (10 m), lengths of 5 - 30 mi (10 - 50 km), and spacing of 1 mi (2 km). The sand ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Sand waves are usually found in patches of 5 - 10 with heights of about 7 ft. (2 m), lengths of 165 - 330 ft. (50 - 100 m), and 0.6 - 1 mi (1 - 2 km) between patches. Sand waves are temporary features that form and re-form in different locations. They usually occur on the inner shelf. Because tidal currents southwest of Nantucket Shoals and southeast of Long Island and Rhode Island slow significantly, there is a large mud patch on the seafloor where silts and clays settle out.

Artificial reefs are another important Mid-Atlantic Bight habitat. These localized areas of hard structure have been formed more recently than other seabed types by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle & Zetlin 2000). In general, reefs are important for attachment sites, shelter, and food for many species. In addition, fish predators, such as tunas, may be drawn by prey aggregations or may be behaviorally attracted to the reef structure. Estuarine reefs, such as blue mussel beds or oyster reefs, are dominated by epibenthic organisms, as well as crabs, lobsters, and sea stars. These reefs are hosts to a multitude of fish, including gobies, spot, bass (black sea and striped), perch, toadfish, and croaker. Coastal reefs consist of exposed rock, wrecks, kelp, or other hard material. Boring mollusks, algae, sponges, anemones, hydroids, and coral generally dominate these coastal reefs. These reef types also host lobsters, crabs, sea stars, and urchins, as well as a multitude of fish, including; black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black grouper, smooth dogfish, and summer flounder. These epibenthic organisms and fish assemblages are similar to the reefs farther offshore, which generally consist of rocks and boulders, wrecks, and other types of artificial reefs. There is less information available for reefs on the outer shelf, but the fish species associated with these reefs include tilefish, white hake, and conger eel.

While substrate is the primary factor influencing demersal species distribution in the Gulf of Maine and Georges Bank, latitude and water depth are the primary influence in the Mid-Atlantic Bight area.

In terms of numbers, amphipod crustaceans and bivalve mollusks dominate the benthic fauna of this primarily sandy environment. Mollusks (70%) dominate the biomass (Stevenson, et al. 2004). Pratt (1973) identified three broad faunal zones related to water depth and sediment type:

1. The "sand fauna" zone is dominated by polychaetes and was defined for sandy sediments (≤1% silt) that are at least occasionally disturbed by waves, from shore out to a depth of about 164 ft. (50 m).
2. The "silty sand fauna" zone is dominated by amphipods and polychaetes and occurs immediately offshore from the sand fauna zone, in stable sands containing a small amount of silt and organic material.
3. Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley supporting the "silt-clay fauna."

Colvocoresses and Musick (1984) identified the following assemblages in the Mid-Atlantic sub region during spring and fall[6].

- Northern (boreal) portions: hake (white, silver, red), goosefish (monkfish), longhorn sculpin, winter flounder, little skate, and spiny dogfish;
- Warm temperate portions: black sea bass, summer flounder, butterfish, scup, spotted hake, and northern sea robin;
- Water of the inner shelf: windowpane flounder;
- Water of the outer shelf: fourspot flounder; and
- Water of the continental slope: shortnose greeneye, offshore hake, blackbelly rosefish, and white hake.

5.5.4 Essential Fish Habitat Designations

The Sustainable Fisheries Act defines EFH as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." EFH designations for all northeast multispecies groundfish and for the other species managed by the New England Fishery Management Council were updated in April 2018 as part of the NEFMC Omnibus EFH Amendment 2 (NEFMC 2016). The Council began a review of its EFH designations in 2023; a timeline for a fishery management action or actions to update these designations has not yet been established. EFH maps are also available for viewing via the Essential Fish Habitat Mapper: https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper.

[6] Other species were listed as found in these assemblages, but only the species common to both spring and fall seasons are listed.

Table 12 - Summary of geographic distributions and habitat characteristics of Essential Fish Habitat designations for benthic fish and shellfish species managed by the New England and Mid-Atlantic fishery management councils in the Greater Atlantic region, as of October 2019.

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Acadian redfish	Juveniles	Gulf of Maine and the continental slope north of 37°38'N	50-200 in Gulf of Maine, to 600 on slope	Sub-tidal coastal and offshore rocky reef substrates with associated structure-forming epifauna (e.g., sponges, corals), and soft sediments with cerianthid anemones
	Adults	Gulf of Maine and the continental slope north of 37°38'N	140-300 in Gulf of Maine, to 600 on slope	Offshore benthic habitats on finer grained sediments and on variable deposits of gravel, silt, clay, and boulders
American plaice	Juveniles	Gulf of Maine and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-180	Sub-tidal benthic habitats on mud and sand, also found on gravel and sandy substrates bordering bedrock
	Adults	Gulf of Maine, Georges Bank and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-300	Sub-tidal benthic habitats on mud and sand, also gravel and sandy substrates bordering bedrock
Atlantic cod	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including nearshore waters from eastern Maine to Rhode Island and the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	Mean high water-120	Structurally-complex intertidal and sub-tidal habitats, including eelgrass, mixed sand and gravel, and rocky habitats (gravel pavements, cobble, and boulder) with and without attached macroalgae and emergent epifauna
	Adults	Gulf of Maine, Georges Bank, Southern New England, and the Mid-Atlantic to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	30-160	Structurally complex sub-tidal hard bottom habitats with gravel, cobble, and boulder substrates with and without emergent epifauna and macroalgae, also sandy substrates and along deeper slopes of ledges
Atlantic halibut	Juveniles & Adults	Gulf of Maine, Georges Bank, and continental slope south of Georges Bank	60-140 and 400-700 on slope	Benthic habitats on sand, gravel, or clay substrates
Atlantic wolffish	Eggs	U.S. waters north of 41˚N latitude and east of 71˚W longitude	<100	Sub-tidal benthic habitats under rocks and boulders in nests
	Juveniles	U.S. waters north of 41˚N latitude and east of 71˚W longitude	70-184	Sub-tidal benthic habitats
	Adults	U.S. waters north of 41˚N latitude and east of 71˚W longitude	<173	A wide variety of sub-tidal sand and gravel substrates once they leave rocky spawning habitats, but not on muddy bottom
Haddock	Juveniles	Inshore and offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in the Mid-Atlantic region	40-140 and as shallow as 20 in coastal Gulf of Maine	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel
	Adults	Offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in Southern New England	50-160	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel and adjacent to boulders and cobbles along the margins of rocky reefs

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Ocean pout	Eggs	Georges Bank, Gulf of Maine, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	<100	Sub-tidal hard bottom habitats in sheltered nests, holes, or rocky crevices
	Juveniles	Gulf of Maine, on the continental shelf north of Cape May, New Jersey, on the southern portion of Georges Bank, and including certain bays and estuaries in the Gulf of Maine	Mean high water-120	Intertidal and sub-tidal benthic habitats on a wide variety of substrates, including shells, rocks, algae, soft sediments, sand, and gravel
	Adults	Gulf of Maine, Georges Bank, on the continental shelf north of Cape May, New Jersey, and including certain bays and estuaries in the Gulf of Maine	20-140	Sub-tidal benthic habitats on mud and sand, particularly in association with structure forming habitat types; i.e. shells, gravel, or boulders
Pollock	Juveniles	Inshore and offshore waters in the Gulf of Maine (including bays and estuaries in the Gulf of Maine), the Great South Channel, Long Island Sound, and Narragansett Bay, Rhode Island	Mean high water-180 in Gulf of Maine, Long Island Sound, and Narragansett Bay; 40-180 on Georges Bank	Intertidal and sub-tidal pelagic and benthic rocky bottom habitats with attached macroalgae, small juveniles in eelgrass beds, older juveniles move into deeper water habitats also occupied by adults
	Adults	Offshore Gulf of Maine waters, Massachusetts Bay and Cape Cod Bay, on the southern edge of Georges Bank, and in Long Island Sound	80-300 in Gulf of Maine and on Georges Bank; <80 in Long Island Sound, Cape Cod Bay, and Narragansett Bay	Pelagic and benthic habitats on the tops and edges of offshore banks and shoals with mixed rocky substrates, often with attached macro algae
White hake	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including bays and estuaries in the Gulf of Maine	Mean high water - 300	Intertidal and sub-tidal estuarine and marine habitats on fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats
	Adults	Gulf of Maine, including coastal bays and estuaries, and the outer continental shelf and slope	100-400 offshore Gulf of Maine, >25 inshore Gulf of Maine, to 900 on slope	Sub-tidal benthic habitats on fine-grained, muddy substrates and in mixed soft and rocky habitats
Windowpane flounder	Juveniles	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to northern Florida, including bays and estuaries from Maine to Maryland	Mean high water - 60	Intertidal and sub-tidal benthic habitats on mud and sand substrates
	Adults	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to Cape Hatteras, North Carolina, including bays and estuaries from Maine to Maryland	Mean high water - 70	Intertidal and sub-tidal benthic habitats on mud and sand substrates
Winter flounder	Eggs	Eastern Maine to Absecon Inlet, New Jersey (39° 22´N) and Georges Bank	0-5 south of Cape Cod, 0-70 Gulf of Maine and Georges Bank	Sub-tidal estuarine and coastal benthic habitats on mud, muddy sand, sand, gravel, submerged aquatic vegetation, and macroalgae
	Juveniles	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 60	Intertidal and sub-tidal benthic habitats on a variety of bottom types, such as mud, sand, rocky substrates with attached macro algae, tidal wetlands, and eelgrass; young-of-the-year

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
				juveniles on muddy and sandy sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks
	Adults	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 70	Intertidal and sub-tidal benthic habitats on muddy and sandy substrates, and on hard bottom on offshore banks; for spawning adults, also see eggs
Witch flounder	Juveniles	Gulf of Maine and outer continental shelf and slope	50-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
	Adults	Gulf of Maine and outer continental shelf and slope	35-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
Yellowtail flounder	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	20-80	Sub-tidal benthic habitats on sand and muddy sand
	Adults	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	25-90	Sub-tidal benthic habitats on sand and sand with mud, shell hash, gravel, and rocks
Silver hake	Juveniles	Gulf of Maine, including certain bays and estuaries, and on the continental shelf as far south as Cape May, New Jersey	40-400 in Gulf of Maine, >10 in Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats in association with sand-waves, flat sand with amphipod tubes, shells, and in biogenic depressions
	Adults	Gulf of Maine, including certain bays and estuaries, the southern portion of Georges Bank, and the outer continental shelf and some shallower coastal locations in the Mid-Atlantic	>35 in Gulf of Maine, 70-400 on Georges Bank and in the Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats, often in bottom depressions or in association with sand waves and shell fragments, also in mud habitats bordering deep boulder reefs, on over deep boulder reefs in the southwest Gulf of Maine
Offshore hake	Juveniles	Outer continental shelf and slope from Georges Bank to 34° 40'N	160-750	Pelagic and benthic habitats
	Adults	Outer continental shelf and slope from Georges Bank to 34° 40'N	200-750	Pelagic and benthic habitats
Red hake	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including Passamaquoddy Bay to Cape Cod Bay in the Gulf of Maine, Buzzards Bay and Narragansett Bay, Long Island Sound, Raritan Bay and the Hudson River, and lower Chesapeake Bay	Mean high water-80	Intertidal and sub-tidal soft bottom habitats, especially those that that provide shelter, such as depressions in muddy substrates, eelgrass, macroalgae, shells, anemone and polychaete tubes, on artificial reefs, and in live bivalves (e.g., scallops)
	Adults	In the Gulf of Maine, the Great South Channel, and on the outer continental shelf and slope from Georges Bank to North Carolina, including inshore bays and estuaries as far south as Chesapeake Bay	50-750 on shelf and slope, as shallow as 20 inshore	Sub-tidal benthic habitats in shell beds, on soft sediments (usually in depressions), also found on gravel and hard bottom and artificial reefs
Monkfish	Juveniles	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on a variety of habitats, including hard sand, pebbles, gravel, broken shells, and soft mud, also seek shelter among rocks with attached algae

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
	Adults	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on hard sand, pebbles, gravel, broken shells, and soft mud, but seem to prefer soft sediments, and, like juveniles, utilize the edges of rocky areas for feeding
Smooth skate	Juveniles	Offshore Gulf of Maine, some coastal bays in Maine and New Hampshire, and on the continental slope from Georges Bank to North Carolina	100-400 offshore Gulf of Maine, <100 inshore Gulf of Maine, to 900 on slope	Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine
	Adults	Offshore Gulf of Maine and the continental slope from Georges Bank to North Carolina	100-400 offshore Gulf of Maine, to 900 on slope	Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine
Thorny skate	Juveniles	Offshore Gulf of Maine, some coastal bays in the Gulf of Maine, and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 on the slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud
	Adults	Offshore Gulf of Maine and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 on the slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud
Little skate	Juveniles	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-80	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
	Adults	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-100	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
Winter skate	Juveniles	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries from eastern Maine to Chincoteague Bay, Virginia, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-90	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud
	Adults	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries in Maine and New Hampshire, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-80	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud
Barndoor skate	Juveniles and adults	Primarily on Georges Bank and in Southern New England and on the continental slope	40-400 on shelf and to 750 on slope	Sub-tidal benthic habitats on mud, sand, and gravel substrates
Clearnose skate	Juveniles	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-30	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
	Adults	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-40	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom
Rosette skate	Juveniles and adults	Outer continental shelf from approximately 40˚N to Cape Hatteras, North Carolina	80-400	Benthic habitats with mud and sand substrates
Atlantic herring	Eggs	Coastal Gulf of Maine, Georges Bank, and Southern New England	5-90	Sub-tidal benthic habitats on coarse sand, pebbles, cobbles, and boulders and/or macroalgae
Atlantic sea scallop	Eggs	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Inshore and offshore benthic habitats (see adults)
	Larvae	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	No information	Inshore and offshore pelagic and benthic habitats: pelagic larvae (“spat”), settle on variety of hard surfaces, including shells, pebbles, and gravel and to macroalgae and other benthic organisms such as hydroids
	Juveniles	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats initially attached to shells, gravel, and small rocks (pebble, cobble), later free-swimming juveniles found in same habitats as adults
	Adults	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats with sand and gravel substrates
Deep-sea red crab	Eggs	Outer continental shelf and slope throughout the region, including two seamounts	320-640	Benthic habitats attached to female crabs
	Juveniles	Outer continental shelf and slope throughout the region, including two seamounts	320-1300 on slope and to 2000 on seamounts	Benthic habitats with unconsolidated and consolidated silt-clay sediments
	Adults	Outer continental shelf and slope throughout the region, including two seamounts	320-900 on slope and up to 2000 m on seamounts	Benthic habitats with unconsolidated and consolidated silt-clay sediments
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
	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

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Scup	Juveniles	Continental shelf between southwestern Gulf of Maine and Cape Hatteras, North Carolina and in nearshore and estuarine waters between Massachusetts and Virginia	No information	Benthic habitats, in association with inshore sand and mud substrates, mussel and eelgrass beds
	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
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
Golden tilefish	Juveniles and adults	Outer continental shelf and slope from U.S.-Canada boundary to the Virginia-North Carolina boundary	100-300	Burrows in semi-lithified clay substrate, may also utilize rocks, boulders, scour depressions beneath boulders, and exposed rock ledges as shelter
Blueline tilefish	Juveniles and adults	Outer continental shelf from eastern Georges Bank to the Virginia / North Carolina boundary	46 to 256	Horizontal or vertical burrows in sediments composed of silt, clay, and sand
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
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
	Female sub-adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
	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
	Female adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
	Male adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
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
Ocean quahog	Juveniles and adults	Continental shelf from southern New England and Georges Bank to Virginia	9-244	In substrate to depth of 3 ft

5.5.5 Gear Types and Interaction with Habitat

A variety of gears are used in the multispecies fishery. Groundfish vessels fish for target species with: trawl, gillnet, and hook and line gear (including jigs, handline, and non-automated demersal longlines). This section discusses the characteristics of each of the gear types, as well as the typical impacts to the physical habitat associated with each of these gear types. In general, EFH for species and life stages that rely on the seafloor for shelter (e.g., from predators), reproduction, or food is vulnerable to disturbance by bottom tending gear. The most vulnerable habitat is more likely to be hard or rough bottom with attached epifauna. The Council's Omnibus Habitat Amendment 2 includes an assessment of relative habitat vulnerability to the gear types used in the northeast region, which was updated in 2019 (NEFMC 2019).

5.5.5.1 **Trawl Gear**

Trawls are classified by their function, bag construction, or method of maintaining the mouth opening. Function may be defined by the part of the water column where the trawl operates (e.g., bottom) or by the species that it targets (Hayes 1983). Mid-water trawls are designed to catch pelagic species in the water column and do not normally contact the bottom; however, mid-water trawls are prohibited in the Northeast multispecies fishery. Bottom trawls are designed to be towed along the seafloor and to catch a variety of demersal fish and invertebrate species.

Bottom otter trawls account for nearly all commercial bottom trawling activity. A wide range of otter trawls are used in the northeast due to the diversity of fisheries and bottom types encountered in the region (NEFSC 2002c). The specific gear design is often a result of the target species (whether found on or off the bottom) as well as the composition of the bottom (smooth versus rough and soft versus hard). Fishermen tow bottom trawls at a variety of speeds, but average about 5.6 km/hour (3 knots). Several federal FMPs manage the use of this gear. Bottom trawling is also subject to a variety of state regulations throughout the region.

A flatfish trawl is a type of bottom otter trawl designed with a low net opening between the headrope and the footrope and more ground rigging on the sweep. This type of trawl is designed so that the sweep follows the contours of the bottom. As flounders lie in contact with the seafloor, these animals respond to the bottom-tending sweep by swimming up off the bottom where they can be entrained into net. Flatfish trawls are used on smooth mud and sand bottoms. In contrast, a high-rise or fly net with larger mesh has a wide net opening and is used to catch demersal fish that tend to rise higher off the bottom than flatfish (NEFSC 2002).

Bottom otter trawls are rigged with rockhopper gear for use on "hard" bottom (i.e., gravel or rocky bottom), or on mud or sand bottom with occasional boulders. This type of gear seeks to sweep over irregularities in the bottom without damaging the net. The sweep in trawls rigged for fishing on smooth bottoms looks to herd fish into the path of the net (Mirarchi 1998).

The raised-footrope trawl was designed to provide vessels with a means of continuing to fish for small-mesh species without catching groundfish. Raised-footrope trawls fish about 1.6 - 2.0 ft. (0.5 - 0.6 m) above the bottom. Although the doors of the trawl still ride on the bottom, underwater video and observations in flume tanks have confirmed that the sweep in the raised-footrope trawl has much less contact with the seafloor than the traditional cookie sweep (Carr & Milliken 1998).

The haddock separator trawl and Ruhle trawl (bottom trawls) are used to minimize the catch of cod. The design of these gears considers the behavior of fish in response to gear. A haddock separator trawl is a groundfish trawl modified to a vertically oriented trouser trawl configuration. It has two extensions arranged one over the other. A codend is attached to the upper extension and the bottom extension is left open with no codend attached. A horizontal large mesh separating panel constructed with a minimum of 6-inch diamond mesh must be installed between the selvedges joining the upper and lower panels [648.85(a)(3)(iii)(A)]. Haddock generally swim to the upper part of a net and cod swim to the lower part of the net. By inserting a mesh panel in the net, and using two codends, the net effectively divides the catch. The cod can escape if the codend on the lower part of the net is left open (NEFMC 2003). Overall, the haddock separator trawl has had mixed results in commercial fishing operations. The expected ratios of haddock to cod have not been realized. Catches of other demersal species, such as flounders, skates, and monkfish, have also been higher than expected. However, the separator trawl has reduced catches of these species compared to normal fishing practices (NEFMC 2009b).

The Ruhle trawl (previously known as the haddock rope trawl or eliminator trawl) is a four-seam bottom groundfish trawl with a rockhopper. It is designed to reduce the bycatch of cod while retaining or increasing the catch of haddock and other healthy stocks [648.85(b)(6)(iv)(J)(3)]. NMFS approved the Ruhle trawl for use in the DAS program and in the Eastern U.S./Canada Haddock SAP on July 14, 2008 (73 FR 40186) after nearly two years of testing to determine efficacy. Experiments comparing traditional and the new trawl gear showed that the Ruhle trawl reduced bycatch of cod and flounders, while simultaneously retaining the catch of healthier stocks, primarily haddock. The large, 8-foot mesh in the forward end (the wings) of the Ruhle trawl net allows cod and other fish to escape because of their body shapes and unique behavior around the netting.

5.5.5.2 **Gillnet Gear**

In addition to trawl gear, the fishery is also prosecuted using gillnets. A bottom gillnet is a large wall of netting equipped with floats at the top and lead weights along the bottom. Bottom gillnets are anchored or staked in position. Fish are caught while trying to pass through the net mesh. The meshes of individual gillnets are uniform in size and shape and therefore are highly selective for a particular size of fish (Jennings et al. 2001). Bottom gillnets are fished in two different ways, as "standup" and "tiedown" nets (Williamson 1998). Standup nets typically catch Atlantic cod, haddock, pollock, and hake and are soaked (duration of time the gear is set) for 12 - 24 hours. Tiedown nets are set with the floatline tied to the leadline at 6-ft (1.8 m) intervals, so that the floatline is close to the bottom and the net forms a limp bag between each tie. They are left in the water for 3-4 days and are used to catch flounders and monkfish.

Individual sink/anchor gillnets are about 295 ft. (90 m) long. They are usually fished as a series of 5 - 15 nets attached end-to-end. A vast majority of “strings” consist of 10 gillnets. Gillnets typically have three components: the leadline, webbing, and floatline. In New England, leadlines are approximately 66 lbs/net (30 kg/net). Webs are monofilament, with the mesh size depending on the species of interest. Nets are anchored at each end using materials such as pieces of railroad track, sash weights, or Danforth anchors, depending on currents. Anchors and leadlines have the most contact with the bottom. For Northeast groundfish, gillnets are tended daily to semiweekly (NEFSC 2002c).

5.5.5.3 **Fish Traps and Pots**

Fish traps, pots, and lobster pots are similar. A non-lobster trap could be a trap that is configured with small mesh or small entrances that effectively exclude lobsters, or a floating trap that is fished off the bottom. If a fish pot or trap is configured in such a way that it is not capable of catching lobster, then NMFS would not consider it to be a lobster trap, and the vessel would not be subject to the lobster trap gear specifications. NMFS has determined that the floating Norwegian fish pots are not lobster traps.

The Norwegian-design pots are collapsible two-chamber rectangular pots made of netting, with a single bridle with anchor along the short end of the pot, allowing it to float and to turn with the current, adapted from Furevik et al. (2008). They have one entrance at the opposite end as the bridle and are made of 50 mm black poly mesh for the trap body and 50 mm white poly for the entrances (into the pot and between chambers). Three frames per pot are constructed of 2 cm diam. PVC electrical conduit, with 13 cm radius corners, glued with cement. The frame sizes are approx. 1.5 m x 1 m (4.79 ft x 3.28 ft), hung 0.7 m (2.3 ft) apart forming two chambers with a widemouth entrance in between. The bridles are anchored with >5 kg links of chain. The PVC pipes are then perforated and 11 deep-water gillnet floats are added along the upper frame to achieve proper orientation. During a tank study (Furevik et al. 2008), the top of the Norwegian pot was measured to be 3 m off bottom; the bottom of the pot was 1.5 m off-bottom.

5.5.5.4 **Hook and Line Gear**

5.5.5.4.1 **Hand Lines/Rod and Reel**
Fishermen use hand lines as well as rods and reels in the Northeast Region to catch a variety of demersal species. Handlines are the simplest form of hook and line fishing. It may be fished using a rod and reel or simply "by hand." The gear consists of a line, sinker (weight), gangion, and at least one hook. The line is typically stored on a small spool and rack and varies in length. The sinkers vary from stones to cast lead. The hooks can vary from single to multiple arrangements in "umbrella" rigs. Fishermen use an attraction device such as natural bait or an artificial lure with the hook. Handlines can be carried by currents until retrieved or fished in such a manner as to hit bottom and bounce (Stevenson, et al. 2004).

5.5.5.4.2 **Mechanized Line Fishing**
Mechanized line-hauling systems use electrical or hydraulic power to work the lines on the spools. They allow smaller fishing crews to work more lines. Fishermen mount the reels, also called "bandits," on the vessel bulwarks with the mainline wound around a spool. They take the line from the spool over a block at the end of a flexible arm. Each line may have a number of branches and baited hooks.

Fishermen use jigging machines to jerk a line with several unbaited hooks up in the water to attract a fish. Fishermen generally use fish jigging machine lines in waters up to 1,970 ft. (600 m) deep. Hooks and sinkers can contact the bottom. Depending upon the way the gear is used, it may catch a variety of demersal species.

5.5.5.4.3 **Bottom Long Lines**
This gear consists of a long length of line to which gangions carrying baited hooks are attached. Longlining is undertaken for a wide range of bottom species. Bottom longlines typically have up to six individual longlines strung together for a total length of more than 1,476 ft. (450 m) and are deployed with 20 - 24 lbs (9 - 11 kg) anchors. The mainline is a parachute cord. Gangions are typically 16 in (40 cm) long and 3 - 6 ft (1 - 1.8 m) apart and are made of shrimp twine. These bottom longlines are usually set for a few hours at a time (NEFSC 2002c).

All hooks must be 12/0, or larger, circle hooks. A circle hook is a hook with the point turned back towards the shank. The barbed end of the hook may be displaced (offset) relative to the parallel plane of the eyed-end or shank of the hook when laid on its side or may be in-line. Habitat impacts from bottom long lines are negligible.

5.5.5.5 **Gear Interaction with Habitat**
The Council has included habitat impacts assessments in its fishery management plans since the early 2000s. Amendment 13 (NEFMC 2003) included a comprehensive evaluation of gear effects on habitat. The amendment described the general effects of bottom trawls on benthic marine habitats. This analysis primarily used an advisory report prepared for the International Council for the Exploration of the Seas (ICES 2000). The report generally concluded that: (1) low-energy environments are more affected by bottom trawling; and (2) bottom trawling affects the potential for habitat recovery (i.e., after trawling ceases, benthic communities and habitats may not always return to their original pre- impacted state).

The Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (NRC 2002) prepared an evaluation of the habitat effects of trawling and dredging that was also evaluated during Amendment 13. This report identified four general conclusions regarding the types of habitat modifications caused by bottom trawls:

- Trawling reduces habitat complexity;
- Repeated trawling results in discernible changes in benthic communities;
- Bottom trawling reduces the productivity of benthic habitats; and

- Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance.

In 2002, NEFMC and MAMFC convened a regional workshop to evaluate the existing scientific research on the effects of fishing gear on benthic habitats; determine the degree of impact from various Northeast gear types; specify the type of evidence that is available to support the conclusions made about the degree of impact; rank the relative importance of gear impacts to various habitat types; and provide recommendations on measures to minimize those adverse impacts. The panel was provided with a summary of available research studies relating to the effects of bottom otter trawls, bottom gillnets, and bottom longlines. Relying on this information plus professional judgment, the panel identified the effects and the degree of impact of these gears on mud, sand, and gravel/rock habitats.

In general, the panel determined that impacts from trawling are greater in gravel/rock habitats with attached epifauna. The panel ranked impacts to biological structure higher than impacts to physical structure. Effects of trawls on major physical features in mud (deep water clay-bottom habitats) and gravel bottom were described as permanent. Impacts to biological and physical structure were given recovery times of months to years in mud and gravel. Impacts of trawling on physical structure in sand were estimated to be of shorter duration (days to months) given the exposure of most continental shelf sand habitats to strong bottom currents and/or frequent storms. Impacts of sink gillnets and bottom longlines on sand and gravel habitats were estimated to be less than bottom trawl impacts. The duration of impacts to physical structures from these gear types would be expected to last days to months on soft mud but could be permanent on hard bottom clay structures along the continental slope. Impacts to mud would be caused by gillnet lead lines and anchors. Physical habitat impacts from sink gillnets and bottom longlines on sand would not be expected. The workshop report (NEFSC 2002c) noted that factors such as frequency of disturbance from fishing and from natural events are important when evaluating impacts.

The Council's Omnibus Essential Fish Habitat Amendment 2 (OHA2) evaluated existing habitat management areas and developed new habitat management areas. To assist with this effort, the Council developed an analytical approach to characterize and map habitats and to assess the extent to which different habitat types are vulnerable to different types of fishing activities. This body of work, termed the Swept Area Seabed Impact approach, includes a quantitative, spatially-referenced model that overlays fishing activities on habitat through time to estimate both potential and realized adverse effects to EFH. The approach is summarized in Volume 1 of the FEIS and detailed in Appendix D. Both documents are available at http://www.nefmc.org/library/omnibus-habitat-amendment-2. The SASI approach builds on previous fishing impacts assessments including the 2002 workshop, and reached similar conclusions, but made the assessment more explicitly spatial. This spatial approach facilitated the use of the assessment when developing management areas. In 2018-2019, the Council updated SASI with additional years of fishing effort data and sediment data, and some changes to the structure of the model. The updated analysis is referred to as the Fishing Effects Model, or FE Model. A version of the FE Model was previously developed for the North Pacific region of the U.S. (Smeltz et al. 2019). The FE model includes many elements of SASI as well as elements from another model developed for the North Pacific region (Fujioka 2006). The FE Model report is available at https://www.nefmc.org/library/fishing-effects-model. The discussion below summarizes both the SASI and FE models.

The spatial domain of the models is U.S. waters from Cape Hatteras to the U.S.-Canada border. SASI included federal waters (3-200 miles) only, but FE includes state waters as well. Within this region, habitats were defined based on natural disturbance regime and dominant substrate, given previous assessments that natural disturbance may mask or interact with human-caused disturbance. Energy at the seabed was inferred from an oceanography model (flow) and a coastal relief model (depth) and was binned into two categories, either high or low energy. Substrate type is an important determinant of habitat because it influences the distribution of managed species, structure-forming epifauna, and prey species by providing spatially discrete resources such as media for burrowing organisms, attachment points for vertical epifauna, etc. The dominant substrate map used in SASI/FE was composed of thousands of visual and grab-sample observations, with grid size based on the spacing of the observations. The underlying spatial resolution of the substrate grid is much higher on Georges Bank and on the tops of banks and ledges in the Gulf of Maine than it is in deeper waters. Habitat definitions for both SASI and FE are based on five sediment grain sizes, mud, sand, pebble, cobble, and boulder. The FE model adds a steep and deep habitat category to account for areas of high relief where deep-sea coral ecosystems occur

One of the outputs of the model is habitat vulnerability, which is related in part to the characteristics of the habitat itself, and part to the quality of the impact. Because of a general need for attachment sites, epifauna that provided a sheltering function for managed species tend to be more diverse and abundant in habitats containing larger grain sized substrates. Consistent with previous findings, the literature review completed to support the SASI and FE models found that structurally complex and/or long-lived epifaunal species are more susceptible to gear damage and slower to recover to impacts from mobile gears, including trawls and dredges. Recovery rates were assumed to be slower in low energy areas, such that overall vulnerability (susceptibility + recovery) of low energy areas is greater than high energy areas, other factors being equal. Of the mobile gears, hydraulic dredges were estimated to have the greatest per unit area impact, with lower and similar per unit area impacts associated with bottom otter trawls and scallop dredges. Although the literature on fixed gear impacts is relatively sparse, it was estimated that mobile gears have a greater per-unit area swept impact than fixed gears. Again, this was consistent with previous findings. Combining the SASI/FE vulnerability assessment and spatial model, gravel habitats on Georges Bank and in the Gulf of Maine were identified as vulnerability hotspots for all gear types, with moderate vulnerability in deeper, low energy habitats in the Gulf of Maine and along the continental margin, and lower vulnerability in sand habitats on Georges Bank, in Southern New England, and in the Mid-Atlantic Bight. Steep and deep habitats are also more vulnerable to impact.

The FE model in particular emphasizes the realized impacts of fishing by modeling how the magnitude of fishing in different locations across the model domain influences patterns of habitat disturbance. Habitat impacts are expressed as percent disturbance in 5 km by 5 km grid cells. The model is run continuously over time, with monthly changes in fishing effort by gear type. As time progresses and habitats begin to recover from previous impacts, new fishing impacts can continue to affect the condition of the seabed. Thus, the percent disturbance at a given time and location represents a combination of current and prior habitat impacts.

5.6 PROTECTED SPECIES

5.6.1 Species Present in the Area

Numerous protected species occur in the affected environment of the Northeast Multispecies FMP (Table 13), and could be impacted by the proposed action (i.e., there have been observed/documented interactions in the fisheries or with gear types like those used in the fisheries (i.e., recreational fishery: hook and line; commercial fishery: bottom trawl and gillnet gear)). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

Table 13 – Species protected under the ESA and/or MMPA that may occur in the affected environment of the Northeast multispecies fishery.

Species	Status	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***Yes***
Humpback whale, West Indies DPS (*Megaptera novaeangliae)*	Protected (MMPA)	Yes
Fin whale (Balaenoptera physalus)	***Endangered***	***Yes***
Sei whale (Balaenoptera borealis)	***Endangered***	***Yes***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***Yes***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (Globicephala spp.)[2]	Protected (MMPA)	Yes
Pygmy sperm whale (*Kogia breviceps*)	Protected (MMPA)	No
Dwarf sperm whale (*Kogia sima*)	Protected (MMPA)	No
Risso's dolphin (*Grampus griseus*)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected (MMPA)	Yes
Short Beaked Common dolphin (*Delphinus delphis*)	Protected (MMPA)	Yes
Atlantic Spotted dolphin (*Stenella frontalis*)	Protected (MMPA)	No
Striped dolphin (*Stenella coeruleoalba*)	Protected (MMPA)	No
Bottlenose dolphin, Western North Atlantic (WNA) Offshore Stock (*Tursiops truncatus*)	Protected (MMPA)	Yes
Bottlenose dolphin WNA Northern Migratory Coastal Stock (Tursiops truncatus)	***Protected (MMPA)***	***Yes***
Bottlenose dolphin, WNA Southern Migratory Coastal Stock (Tursiops truncatus)	***Protected (MMPA)***	***Yes***
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	Yes
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*)	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
Giant manta ray (*Manta birostris)*	Threatened	Yes
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes

Species	Status	Potentially impacted by this action?
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected (MMPA)	Yes
Gray seal (*Halichoerus grypus*)	Protected (MMPA)	Yes
Harp seal (*Phoca groenlandicus*)	Protected (MMPA)	Yes
Hooded seal (*Cystophora cristata*)	Protected (MMPA)	Yes
Critical Habitat		
North Atlantic Right Whale	ESA Designated	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA Designated	No

Notes: Marine mammal species italicized and in bold are considered MMPA strategic stocks.[1]
[1] A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3 of the MMPA of 1972).
[2] There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.

5.6.2 Species and Critical Habitat Not Likely Impacted by the Proposed Action

Based on available information, it has been determined that this action is unlikely to impact multiple ESA listed and/or MMPA protected species or any designated critical habitat (Table 13). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or based on the most recent ten years of information on documented interactions between the species and the primary gear type (i.e., bottom trawl and gillnet) used to prosecute the Northeast multispecies fishery (Greater Atlantic Region (GAR) Marine Animal Incident Database, unpublished data; NMFS Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality reports; MMPA List of Fisheries (LOF); NMFS 2021a)[7]. In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 12. and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2021a).

5.6.3 Species Potentially Impacted by the Proposed Action

Table 13 lists protected species of sea turtle, marine mammal, and fish species present in the affected environment of the Northeast multispecies fishery, and that may also be impacted by the operation of this fishery; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute

[7] For marine mammal species (ESA listed or MMPA protected), the most recent 10 years of information on estimated serious injury and mortality in commercial fisheries covers the timeframe between 2013-2022. For ESA listed species of sea turtles and fish, information on observer or documented interactions with fishing gear is from 2014-2023.

the fishery. To help identify MMPA protected species potentially impacted by the action, NMFS Marine Mammal SARs for the Atlantic Region, MMPA List of Fisheries (LOF), NMFS (2021b), NMFS NEFSC observer/sea sampling database (unpublished data), and NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality reports were referenced.

To help identify ESA listed species potentially impacted by the action, the NMFS NEFSC observer/sea sampling, Sea Turtle Disentanglement Network (STDN), and the GAR Marine Animal Incident databases for interactions were queried and the May 27, 2021, Biological Opinion issued by NMFS was reviewed (NMFS 2021a).

As the primary concern for both MMPA protected and ESA listed species is the potential for the fishery to interact (e.g., bycatch, entanglement) with these 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) data and observed records of protected species interaction with particular fishing gear types, in order to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the Northeast multispecies fishery and on protected species interactions with specific fishery gear is provided below.

5.6.3.1 **Sea Turtles**

Below is a summary of the status and trends, as well as the occurrence and distribution of sea turtles in the affected environment of the Northeast multispecies fishery. More 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 several published documents, including NMFS (2021a); sea turtle status reviews and biological reports (Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS 2015b; NMFS and USFWS 2007d, 2015, 2020, 2023), and recovery plans for the loggerhead (Northwest Atlantic DPS) sea turtle (NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS et al. 2011), and green sea turtle (North Atlantic DPS) (NMFS and USFWS 1991).

Status and Trends

Four sea turtle species could 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 13). 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, Peninsular Florida 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 nestings (Northwest Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (Bolten et al. 2019, NMFS and USFWS 2023).

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 (NMFS and USFWS 2015; Caillouett et al. 2018). Nest numbers have fluctuated in recent years. In 2020, there were 20,205 nests (Burchfield et al. 2021), which was a bit lower than 2017, which had the highest number (24,587) of nests. While the nesting trend is encouraging, given previous fluctuations in nesting and continued anthropogenic threats to the species, the overall trend is unclear.

The North Atlantic DPS of green sea turtle, overall, is showing a mixed trend in nesting. Green turtle nesting in Florida is increasing, with a record breaking year in 2023 with 76,645 nests, and Caribbean Mexico and Cuba nesting also continues to increase. However, a recent analysis of 51 years of nesting data shows a recent (beginning in 2009) downward trend in green turtle nesting at Tortuguero, the largest nesting assemblage for this DPS (Restrepo et al. 2023). As anthropogenic threats to this species continue, the differences in nesting trends will need to be monitored to verify the North Atlantic DPS resiliency 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 and USFWS, 2020). Given continued anthropogenic threats to the species, according to NMFS (2021a), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

Occurrence and Distribution

Hard-shelled sea turtles - 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,b; Mitchell et al. 2003; Shoop & Kenney 1992; TEWG 2009; Blumenthal et al. 2006; Braun-McNeill & Epperly 2002; 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). 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 2002; Epperly et al. 1995a,b,c; 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 (i.e., November). By December, sea turtles have migrated south to waters off Cape Hatteras, North Carolina and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly et al. 1995b; Griffin et al. 2013; Hawkes et al. 2011; Shoop & Kenney 1992).

Leatherback sea turtles - Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (James *et al.* 2005; Eckert *et al.* 2006; Murphy *et al.* 2006; NMFS and USFWS 2013b; Dodge *et al.* 2014). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (NMFS and USFWS 1992; James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014). They are found in more northern waters (i.e., GOM) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014). The mid-Atlantic bight may serve as an important foraging ground for this species (Rider *et al*. 2024).

5.6.3.2 Large Whales

Status and Trends

Six large whale species have the potential to be impacted by the proposed action: humpback, North Atlantic right, fin, sei, sperm, and minke whales (Table 13). Large whale stock assessment reports covering the period of 2011-2020, indicate a decreasing trend for the North Atlantic right whale population; however, for fin, humpback, minke, sperm, and sei whales, it is unknown what the population trajectory is as a trend analysis has not been conducted. The NMFS Marine Mammal SARs for the Atlantic Region has more information on the status of humpback, North Atlantic right, fin, sei, sperm, and minke whales.

Occurrence and Distribution

North Atlantic right, humpback, fin, sei, sperm, and minke whales occur in the Northwest Atlantic Ocean. As large whales may be present in these waters throughout the year, the Northeast multispecies fishery and large whales are likely to co-occur in the affected area. To further assist in understanding how the Northeast multispecies fishery overlaps in time and space with the occurrence of large whales, Table 14 provides an overview of species occurrence and distribution in the affected environment of the fishery. For additional information on North Atlantic right, humpback, fin, sei, sperm, and minke whales refer to: NMFS Marine Mammal SARs for the Atlantic Region.

Table 14 – Large whale occurrence, distribution, and habitat use in the affected environment of the Northeast multispecies fishery.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
North Atlantic Right Whale	• Predominantly occupy waters of the continental shelf, but based on passive acoustic and telemetry data, are also known to make lengthy excursions into deep waters off the shelf. • Visual and acoustic data demonstrate broad scale, year-round presence along the U.S. eastern seaboard (e.g., GOM, New Jersey, and Virginia). • Surveys have demonstrated the existence of several areas where North Atlantic right whales congregate seasonally, including Cape Cod Bay; Massachusetts Bay; and the continental shelf south of New England. Although whales can be found consistently in particular locations throughout their range, there is a high inter-annual variability in right whale use of some habitats. Since 2010, acoustic and visual surveys indicate a shift in habitat use patterns, including: > Fewer individuals are detected in the Great South Channel; > increase in the number of individuals using Cape Cod Bay (i.e., during the expected late winter and early spring foraging period and during the 'off season' period of summer and fall); > apparent abandonment of central GOM in the winter; and, > Large increase in the numbers of whales detected in a region south of Martha's Vineyard and Nantucket Islands (i.e., during the expected late winter and early spring foraging period and during the 'off season' period of summer and fall). > Passive acoustic monitoring suggests a shift to a year-round presence in the Mid-Atlantic, including year-round detections in the New York Bight with the highest presence between late February and mid-May in the shelf zone and nearshore habitat).
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year. • New England waters (GOM and GB) = Foraging Grounds (~March- November); however, acoustic detections of humpbacks indicate year-round presence in New England waters, including the waters of Stellwagen Bank. • Mid-Atlantic waters: Increasing evidence that mid-Atlantic areas are becoming an important habitat for juvenile humpback whales. • Since 2011, increased sightings of humpback whales in the New York-New Jersey Harbor Estuary, in waters off Long Island, and along the shelf break east of New York and New Jersey. • Increasing visual and acoustic evidence of whales remaining in mid- and high-latitudes throughout the winter (e.g., Mid- Atlantic: waters near Chesapeake and Delaware Bays, peak presence about January through March; Massachusetts Bay: peak presence about March-May and September-December).
Fin	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB; • Recent review of sighting data shows evidence that, while densities vary seasonally, fin whales are present in every season throughout most of the EEZ north of 30ºN. • New England waters (GOM and GB) = Major Foraging Ground

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
Sei	• Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks.; however, incursions into shallower, shelf waters do occur (e.g., Stellwagen Bank, Great South Channel, waters south of Nantucket, Georges Bank). • Spring through summer, sightings concentrated along the northern, eastern (into Northeast Channel) and southwestern (in the area of Hydrographer Canyon) edge of Georges Bank, and south of Nantucket, MA. • Recent acoustic detections peaked in northern latitudes in the summer, indicating feeding grounds ranging from Southern New England through the Scotian Shelf. • Persistent year-round detections in Southern New England and the New York Bight indicate this area to be an important region for sei whales. • The wintering habitat remains largely unknown. Passive acoustic monitoring conducted in 2015-2016 off Georges Bank detected sei whales calls from late fall through the winter along the southern Georges Bank region (off Heezen and Oceanographer Canyons).
Sperm	• Distributed on the continental shelf edge, over the continental slope, and into mid-ocean regions. • Seasonal Occurrence in the U.S. EEZ: >**Winter**: concentrated east and northeast of Cape Hatteras; >**Spring**: center of distribution shifts northward to east of Delaware and Virginia, and is widespread throughout the central portion of the mid-Atlantic bight and the southern portion of Georges Bank; >**Summer**: similar distribution to spring, but also includes the area east and north of Georges Bank and into the Northeast Channel region, as well as the continental shelf (inshore of the 100-m isobath) south of New England; and, >**Fall**: occur in high levels south of New England, on the continental shelf. Also occur along continental shelf edge in the mid-Atlantic bight.
Minke	• Widely distributed within the U.S. EEZ. • Spring to Fall: widespread (acoustic) occurrence on the continental shelf; most abundant in New England waters during this period of time. • September to April: high (acoustic) occurrence in deep-ocean waters.

Notes: SNE=Southern New England; GOM=Gulf of Maine; GB=Georges Bank
***Sources*:** Baumgartner *et al*. 2007; Baumgartner *et al*. 2011; Baumgartner and Mate 2003; Bort *et al*. 2015; Brown *et al*. 2002, 2017; CETAP 1982; Charif et al. 2020; Cholewiak et al. 2018; Clapham *et al*. 1999; Clark and Clapham 2004; Cole *et al*. 2013; Davis *et al.* 2017, 2020; Ganley et al. 2019; Good 2008; Hain *et al.* 1992; Hamilton and Mayo 1990; Hayes *et al*. 2017, 2018, 2019, 2020, 2021, 2022, 2023; Kenney *et al.* 1986, 1995; Khan *et al*. 2009, 2010, 2011, 2012; Kraus et al. 2016; Leiter *et al*. 2017; Mate *et al*. 1997; Mayo et al. 2018; McLellan *et al*. 2004; Moore et al. 2021; Morano et al. 2012; Muirhead et al. 2018; Murray et al. 2013; NMFS 1991, 2005, 2010, 2011, 2012; 2015, 2021a,b; NOAA 2008; Pace and Merrick 2008; Palka et al. 2017; Palka 2020;Payne *et al*. 1984; Payne *et al*.1990; Pendleton *et al*. 2009; Record *et al*. 2019; Risch *et al*. 2013; Robbins 2007; Roberts et al. 2016; Salisbury et al. 2016; Schevill *et al*. 1986; Stanistreet et al. 2018; Stone et al. 2017; Swingle *et al*. 1993; Vu *et al*. 2012; Watkins and Schevill 1982; Whitt et al. 2013; Winn *et al.* 1986; 81 FR 4837 (January 27, 2016); 86 FR 51970 (September 17, 2021).

5.6.3.3 **Small Cetaceans**

Status and Trends

Risso's, white-sided, short beaked common, and bottlenose dolphins (Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal stocks); long and short –finned pilot whales; and harbor porpoise could be impacted by the proposed action (Table 13). Review of the most recent stock assessment (Hayes et al. 2021) indicates that as a trend analysis has not been conducted for Risso's, white-sided, short-beaked common dolphins; long-finned pilot whales; or harbor porpoise, the population trajectory for these species is unknown. For short-finned pilot whales a generalized linear model indicated no significant trend in the abundance estimates (Hayes et al 2022). For the Western North Atlantic Offshore stock, review of the most recent information on the stock shows no statistically significant trend in population size for this species; however, the high level of uncertainty in the estimates limits the ability to detect a statistically significant trend (Hayes et al. 2021). In regards to the Northern and Southern Migratory Coastal stocks (both considered a strategic stock under the MMPA), the most recent analysis of trends in abundance suggests a probable decline in stock size between 2010– 2011 and 2016, concurrent with a large UME in the area; however, there is limited power to evaluate trends given uncertainty in stock distribution, lack of precision in abundance estimates, and a limited number of surveys (Hayes et al. 2021).

Occurrence and Distribution

Atlantic white sided dolphins, short and long finned pilot whales, Risso's dolphins, short beaked common dolphins, harbor porpoise, and several stocks of bottlenose dolphins are found throughout the year in the Northwest Atlantic Ocean (see NMFS Marine Mammal SARs for the Atlantic Region). Within this range, however, there are seasonal shifts in species distribution and abundance. To further assist in understanding how the Northeast multispecies fishery overlaps in time and space with the occurrence of small cetaceans, Table 15 provides an overview of species occurrence and distribution in the affected environment of the fishery. For additional information on small cetacean occurrence and distribution in the Northwest Atlantic, refer to NMFS Marine Mammal SARs for the Atlantic Region.

Table 15 – Small cetacean occurrence and distribution in the affected environment of the Northeast multispecies fishery.

Species	Occurrence and Distribution in the Affected Environment
Atlantic White Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM; however, most common in continental shelf waters from Hudson Canyon (~ 39°N) to GB, and into the GOM. • **January-May**: low densities found from GB to Jeffreys Ledge. • **June-September**: Large densities found from GB, through the GOM. • **October-December**: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic), particularly around Hudson Canyon, low densities found year-round, • Virginia (VA) and North Carolina (NC) waters represent southern extent of species range during winter months.
Short Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 m isobaths) of the Mid-Atlantic, SNE, and GB (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons).

Species	Occurrence and Distribution in the Affected Environment
	• Less common south of Cape Hatteras, NC, although schools have been reported as far south as the Georgia/South Carolina border. • **January-May**: occur from waters off Cape Hatteras, NC, to GB (35º to 42ºN). • **Mid-summer-autumn**: Occur in the GOM and on GB; *Peak abundance* found on GB in the autumn.
Risso's Dolphin	• **Spring through fall**: Distributed along the continental shelf edge from Cape Hatteras, NC, to GB. • **Winter**: distributed in the Mid-Atlantic Bight, extending into oceanic waters. • Rarely seen in the GOM; primarily a Mid-Atlantic continental shelf edge species (can be found year-round).
Harbor Porpoise	• Distributed throughout the continental shelf waters of the Mid-Atlantic, SNE, GB, and GOM. • **July-September**: Concentrated in the northern GOM (waters <150 meters); low numbers can be found on GB. • **October-December**: widely dispersed in waters from New Jersey (NJ) to Maine (ME); seen from the coastline to deep waters (>1,800 meters). • **January-March**: intermediate densities in waters off NJ to NC; low densities found in waters off New York (NY) to GOM. • **April-June**: widely dispersed from NJ to ME; seen from the coastline to deep waters (>1,800 meters). • Passive acoustic monitoring indicates regular presence from January through May offshore of Maryland.
Bottlenose Dolphin	**Western North Atlantic Offshore Stock** • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from GB to Florida (FL). • Depths of occurrence: ≥40 meters **Western North Atlantic Northern Migratory Coastal Stock** • Most common in coastal waters <20 m deep. • Warm water months (e.g., July-August): distributed from the coastal waters from the shoreline to about 25-m isobaths between the mouth of the Chesapeake Bay and Long Island, NY. • Cold water months (e.g., January-March): stock occupies coastal waters from Cape Lookout, NC, to the NC/VA border. **Western North Atlantic Southern Migratory Coastal Stock** • Most common in coastal waters <20 m deep. • **October-December**: appears stock occupies waters of southern NC (south of Cape Lookout) • **January-March**: appears stock moves as far south as northern FL. • **April-June**: stock moves north to waters of NC. • **July-August**: stock is presumed to occupy coastal waters north of Cape Lookout, NC, to the eastern shore of VA (as far north as Assateague).

Species	Occurrence and Distribution in the Affected Environment
Pilot Whales: *Short- and Long-Finned*	**Short- Finned Pilot Whales** • Except for area of overlap (see below), primarily occur south of 40ºN (Mid-Atlantic and SNE waters); although low numbers have been found along the southern flank of GB, but no further than 41ºN. • Distributed primarily near the continental shelf break of the Mid-Atlantic and SNE (i.e., off Nantucket Shoals). **Long-Finned Pilot Whales** • Except for area of overlap (see below), primarily occur north of 42ºN. • Winter to early spring: distributed principally along the continental shelf edge off the northeastern U.S. coast. • Late spring through fall: movements and distribution shift onto GB and into the GOM and more northern waters. • Species tends to occupy areas of high relief or submerged banks. **Area of Species Overlap:** along the mid-Atlantic shelf break between Delaware and the southern flank of GB.
Notes: Information is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to 2,000 m depth ***Sources*:** Hayes *et al*. 2017; Hayes *et al.* 2018; Hayes *et al.* 2019; Hayes *et al*. 2020; Hayes et al. 2022 ; Payne and Heinemann 1993; Payne *et al.* 1984; Jefferson *et al*. 2009.	

5.6.3.4 **Pinnipeds**

Status and Trends

Harbor, gray, harp and hooded seals are identified as having the potential to be impacted by the proposed action (Table 14). Based on Hayes et al. (2019) and Hayes et al. (2022), the status of the:

- Western North Atlantic harbor seal and hooded seal, relative to Optimum Sustainable Population (OSP), in the U.S. Atlantic EEZ is unknown;
- gray seal population relative to OSP in U.S. Atlantic EEZ waters is unknown, but the stock's abundance appears to be increasing in Canadian and U.S. waters; and,
- harp seal stock, relative to OSP, in the U.S. Atlantic EEZ is unknown, but the stock's abundance appears to have stabilized.

Occurrence and Distribution

Harbor, gray, harp, and hooded seals are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. Depending on species, they may be present year-round or seasonally in some portion of the affected environment of the Northeast multispecies fishery. To further assist in understanding how the Northeast multispecies fishery overlaps in time and space with the occurrence of pinnipeds, Table 16 provides an overview of species occurrence and distribution in the affected environment of the fishery. For additional information on pinniped occurrence and distribution in the Northwest Atlantic, refer to NMFS Marine Mammal SARs for the Atlantic Region.

Table 16 – Pinniped occurrence and distribution in the affected environment of the Northeast multispecies fishery.

Species	Occurrence and Distribution in the Affected Environment
Harbor Seal	• Year-round inhabitants of Maine; • **September through late May**: occur seasonally along the coasts from southern New England to Virginia.
Gray Seal	• Ranges from New Jersey to Labrador, Canada.
Harp Seal	• Winter-Spring (approx. January-May): Can occur in the U.S. Atlantic Exclusive Economic Zone. • Sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey.
Hooded Seal	• Highly migratory and can occur in waters from Maine to Florida. These appearances usually occur between January and May in New England waters, and in summer and autumn off the southeast U.S. coast and in the Caribbean.
Sources: Marine Mammal SARs for the Atlantic Region	

5.6.3.5 Atlantic Sturgeon

Status and Trends

Atlantic sturgeon (all five DPSs) could be impacted by the proposed action (Table 13). Population trends for Atlantic sturgeon are difficult to discern; however, the most recent stock assessment report concludes that Atlantic sturgeon, at both coastwide and DPS level, are depleted relative to historical levels (ASSRT 2007; ASMFC 2017; NMFS 2021a; ASMFC 2024).

Occurrence and Distribution

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, although individuals are most likely to belong to the DPS in the same general region where they are found (Altenritter et al. 2017; ASMFC 2017b; ASMFC 2024; ASSRT 2007; Breece et al. 2016, 2018; Dovel and Berggren 1983; Dadswell et al. 1984; Dadswell 2006; Dunton et al. 2010, 2015; Erickson et al. 2011; Hilton et al. 2016; Ingram et al. 2019; Kazyak et al. 2021; Kynard et al. 2000; Laney et al. 2007; Novak et al. 2017; O'Leary et al. 2014; Rothermel et al. 2020; Stein et al. 2004a; Waldman et al. 2013; Wippelhauser et al. 2017; Wirgin et al. 2012, 2015a,b).

Based on fishery-independent and dependent surveys, as well as data collected from genetic, tracking, and/or tagging studies in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour; however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Altenritter et al. 2017; Breece et al. 2016; 2018; Collins and Smith 1997; Dunton et al. 2010; Erickson et al. 2011; Ingram et al. 2019; Novak et al. 2017; Rothermel et al. 2020; Stein et al. 2004a,b; Wippelhauser et al. 2017). Data from fishery-independent and dependent surveys, as well as data collected from genetic, tracking, and/or tagging studies also indicate that Atlantic sturgeon make seasonal coastal movements from marine waters to river estuaries in the spring and from river estuaries to marine waters in the fall; however, 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 (Altenritter et al. 2017; Breece et al. 2018;

Dunton et al. 2010; Erickson et al. 2011; Ingram et al. 2019; Novak et al. 2017; Rothermel et al. 2020; Wipplehauser 2012; Wippelhauser et al. 2017).

For additional information on the biology and range wide distribution of each DPS of Atlantic sturgeon refer to: 77 FR 5880 and 77 FR 5914, the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007); the ASMFC's 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017) and 2024 Atlantic Sturgeon Stock Assessment Update (ASMFC 2024), and NMFS (2021a).

5.6.3.6 **Atlantic Salmon (Gulf of Maine DPS)**

Status and Trends

Atlantic salmon (GOM DPS) could be impacted by the proposed action (Table 13). There is no population growth rate available for GOM DPS Atlantic salmon; however, the consensus is that the DPS exhibits a continuing declining trend (NOAA 2016; USFWS and NMFS 2018; NMFS 2021a).

Occurrence and Distribution

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the GOM (primarily the northern portion of the GOM), to the coast of Greenland (NMFS and USFWS 2005, 2016; Fay et al. 2006). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay et al. 2006; USASAC 2013; Hyvarinen et al. 2006; Lacroix and McCurdy 1996; Lacroix et al. 2004, 2005; Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993; Sheehan et al. 2012; NMFS and USFWS 2005, 2016; Fay et al. 2006). For additional information on the on the biology and range wide distribution of the GOM DPS of Atlantic salmon, refer to NMFS and USFWS (2005, 2016); Fay et al. (2006); and NMFS (2021a).

5.6.3.7 **Giant Manta Ray**

Status and Trends

Giant manta rays could be impacted by the proposed action (Table 13). While there is considerable uncertainty regarding the giant manta ray's current abundance throughout its range, the best available information indicates that in areas where the species is not subject to fishing, populations may be stable (NMFS 2021a). However, in regions where giant manta rays are (or were) actively targeted or caught as bycatch populations appear to be decreasing (Miller and Klimovich 2017; Marshall et al. 2022).

Occurrence and Distribution

Based on the giant manta ray's distribution, the species may occur in coastal, nearshore, and pelagic waters off the U.S. east coast from the Gulf of Mexico north to Long Island, New York (Miller and Klimovich 2017; Farmer et al. 2022; NMFS 2024). They are most commonly detected along productive thermal front boundaries both nearshore and at the shelf edge (Farmer et al. 2022). Along the U.S. East Coast, giant manta ray occurrence appears primarily influenced by temperature; the species is usually found in water temperatures between 19 and 30°C, with a peak around 23°C (Miller and Klimovich 2017; Farmer et al. 2022). The North Atlantic giant manta rays appear to exhibit a degree of migratory behavior coinciding with prey abundance, with distribution expanding northward as water temperatures warm during the summer months (Farmer et al. 2022). Occurrences north of Cape Hatteras peak during the months of June-October (Farmer et al. 2022). Limited size estimates suggest that smaller, younger animals more commonly occur in the southeastern U.S., while larger individuals can be observed in the northern portion of the species' range (Farmer et al. 2022). Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller and Klimovich 2017).

5.6.4 Interactions Between Gear and Protected Species

Protected species are at risk of interacting (e.g., bycaught or entangled) with various types of fishing gear, with interaction risks associated with gear type, quantity, soak or tow duration, and degree of overlap between gear and protected species. Information on observed or documented interactions between gear and protected species is available from as early as 1989 (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data). As the distribution and occurrence of protected species and the operation of fisheries (and, thus, risk to protected species) have changed over the last 30 years, we use the most recent 10 years of available information to best capture the current risk to protected species from fishing gear. For marine mammals protected under the MMPA and/or the ESA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2013-2022[8]. For ESA listed species of sea turtles and fish, the most recent 10 years of data on observed or documented interactions is available from 2014-2023[9]. Available information on gear interactions with a given species (or species group) is provided in the sections below. The sections to follow are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on the primary gear types used to prosecute the Northeast multispecies fishery (i.e., recreational fishery: hook and line; commercial fishery: sink gillnet and bottom trawl gear).

5.6.4.1 Recreational Fisheries Interactions

The recreational Northeast multispecies fishery is primarily prosecuted with rod and reel and handline (i.e., hook and line gear). Available information on interactions between protected species and hook and line gear is summarized below. This information is based on overall gear type and is not strictly limited to the recreational Northeast multispecies fishery.

In the absence of an observer program for recreational fisheries, records of recreational hook and line interactions with protected resources are limited. However, as a dedicated observer program exists for all commercial fisheries, there is a wealth of information on observed protected species interactions with all fishing gear types and years of data assessing resultant population level effects of these interactions. Other sources of information, such as state fishing records, stranding databases, and marine mammal stock assessment reports, provide additional information that can assist in better understanding hook and line interaction risks to protected species.

Large Whales

Large whales have been documented entangled with hook and line gear or monofilament line (GAR Marine Animal Incident Database, unpublished data; NMFS Marine Mammal SARs for the Atlantic Region; Cole and Henry 2013; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024). Review of mortality and

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[8] GAR Marine Animal Incident Database, unpublished data; NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC protected species serious injury and mortality reports.

[9] ASMFC 2017; ASMFC 2024; Kocik et al. 2014; NMFS 2021a; GAR Marine Animal Incident Database, unpublished data; NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC protected species serious injury and mortality reports; NMFS NEFSC observer/sea sampling database, unpublished data; GAR Sea Turtle and Disentanglement Network, unpublished data; NMFS Sea Turtle Stranding and Salvage Network, unpublished data.

serious injury determinations for baleen whales between 2013-2022 shows that there have been 68 confirmed cases of hook and line and/or monofilament gear around or trailing from portions of the whale's body (Cole and Henry 2013; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024). Of the 63 cases documented, the majority of them did not result in serious injury to the animal, and none of them resulted in mortality to the whale (87.3% observed/reported whales had a serious injury value of 0; 12.7% had a serious injury value of 0.75[10]; Cole and Henry 2013; Henry et al. 2017; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024). In fact, 94.5% of the whales observed or reported with hook/line or monofilament were resighted gear free and healthy; confirmation of the health of the other remaining whales remain unknown as no resightings had been made over the timeframe of the assessment (Cole and Henry 2013; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024). Based on this information, while large whale interactions with hook and line gear are possible, relative to other gear types, such as fixed gear, hook and line gear appears to represent a low source serious injury or mortality risk to any large whale.

Small Cetaceans and Pinnipeds

Table 15 and Table 16 provides a list of small cetaceans and pinnipeds that occur in the affected environment of the Northeast Multispecies fishery. Reviewing the most recent 10 years of data provided in the NMFS marine mammal SARs, of the small cetacean and pinniped species identified in Table 13, the Western North Atlantic (WNA) Northern and Southern Migratory stocks of bottlenose dolphins and small finned pilot whales are the only species that have been documented with hook and line gear (see NMFS Marine Mammal SARs for the Atlantic Region). As there is no systematic observer program for rod and reel (hook and line) fisheries, most data on hook and line interactions come from stranding data and as such, mean serious injury or mortality estimates are not available; however, a minimum known count of interactions with this gear type is provided in the NMFS Marine Mammal SARs for the Atlantic Region.

Between 2013-2022, there were a total of seven strandings that could be ascribed to the WNA Northern Migratory Coastal bottlenose dolphin stock for which hook and line gear entanglement or ingestion was documented; for the WNA Southern Migratory Coastal bottlenose dolphin stock, there were a total of nine cases. In most instances, it could not be determined if the death or serious injury to the dolphin was caused by hook and line gear. Over this timeframe, an interaction between hook and line gear and a small finned pilot whale was self-reported at sea; the animal was released alive, but considered seriously injured (Maze-Foley and Garrison 2016).

Based on this, although interactions with hook and line gear are possible, relative to other gear types, such as gillnet or trawl gear, hook and line gear appears to represent a low source serious injury or mortality to bottlenose dolphin stocks along the Atlantic coast and small finned pilot whales. For other species of small cetaceans or pinnipeds, hook and line gear does not appear to be a source of serious injury or mortality.

Sea Turtles

Interactions between ESA listed species of sea turtles and hook and line gear have been documented (GAR Sea Turtle and Disentanglement Network (STDN), unpublished data; NMFS Sea Turtle Stranding and Salvage Network (STSSN), unpublished data; NMFS 2021a). Sea turtles are known to ingest baited hooks or have their appendages snagged by hooks, both of which have been recorded in the STSSN

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[10] Any injury leading to a significant health decline (e.g., skin discoloration, lesions near the nares, fat loss, increased cyamid loads) is classified as a serious injury (SI) and will result in a SI value set at 1 (see NMFS NEFSC baleen whale serious injury and morality determination Reference Documents, Publications, or Technical Memoranda)

database. Although, it is assumed that most sea turtles hooked by recreational fishermen are released alive, deceased sea turtles with hooks in their digestive tract have been reported (NMFS 2021a). Some turtles will break free on their own and escape with embedded/ingested hooks and/or trailing line, while others may be cut free by fishermen and intentionally released (NMFS 2021a). These sea turtles will escape with embedded or swallowed hooks or trailing varying amounts of monofilament fishing line, which may cause post-release injury or death (e.g., constriction and strangulation of internal digestive organs; wrapped line results in limb amputation; NMFS 2021a). Given the above, hook and line gear does pose an interaction risk to sea turtles; however, the extent to which these interactions are impacting sea turtle populations is still under investigation, and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of sea turtle populations (NMFS 2021a).

Atlantic Sturgeon

Interactions between ESA-listed species of Atlantic sturgeon and hook and line gear have been documented, particularly in nearshore waters (ASMFC 2017). Interactions with hook and line gear have resulted in Atlantic sturgeon injury and mortality and therefore, poses an interaction risk to these species. However, the extent to which these interactions are impacting Atlantic sturgeon DPSs is still under investigation and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of Atlantic sturgeon DPSs (NMFS 2011b; ASMFC 2017; NMFS 2021a).

Atlantic Salmon

Review of NMFS (2021a), as well as the most recent 10 years of data on observed or documented interactions between Atlantic salmon and fishing gear, show that there have been no observed/documented interactions between Atlantic salmon and hook and line gear (NMFS NEFSC observer/sea sampling database, unpublished data). Based on this information, hook and line gear is not expected to pose an interaction risk to any Atlantic salmon.

Giant Manta Rays

Review of NMFS (2021a), as well as the most recent 10 years of data on observed or documented interactions between giant manta rays and fishing gear, show that there have been no observed/documented interactions between giant manta rays and hook and line gear (NMFS NEFSC observer/sea sampling database, unpublished data). In the draft Recovery Plan for the giant manta ray, NMFS found that recreational fisheries interactions pose a low extinction risk to the species (NMFS 2024). Based on this information, hook and line gear is not expected to pose an interaction risk to giant manta rays.

5.6.4.2 Commercial Fisheries Interactions

5.6.4.2.1 Sea Turtles

Bottom 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 GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2008; Murray 2015; Murray 2020; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a; Warden 2011a,b). As few sea turtle interactions have been observed in the GOM, 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 (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents (Murray 2015). Most recently, 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).

From 2019-2023, Precoda and Murray (2024)[11] estimate that 273 loggerhead (CV=0.20, 95% CI=182-408), 37 Kemp's ridley (CV=0.54, 95% CI=13-108), and 33 leatherback (CV=0.58, 95% CI=8-112) turtle interactions occurred in bottom trawl gear in the U.S. Mid-Atlantic and Georges Bank regions. Mortalities were not reported in Precoda and Murray (2024) but will be forthcoming. The most recent mortality estimates, calculated for the years 2014-2018, estimated the death of 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtles due to interactions with bottom trawl gear (Murray 2020).

Gillnet Gear

Interactions between sink gillnet gear and green, Kemp's ridley, loggerhead, and leatherback sea turtles have been observed in the GAR since 1989 (NMFS NEFSC observer/sea sampling database, unpublished data). Specifically, sea turtle interactions with gillnet gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2009a,b; Murray 2013; Murray 2018; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with sink gillnet gear in this region. As a result, the bycatch estimates and discussion below are for sink gillnet gear in the Mid-Atlantic and Georges Bank.

From 2017-2021, Murray (2023) estimated that sink gillnet fisheries operating from Maine to North Carolina[12] bycaught 142 loggerheads (CV=0.89, 95% CI over all years:15-376), 91 Kemp's ridleys (CV=0.62, CI over all years: 0-218), 49 greens (CV=1.01, 95% CI over all years: 0-177), 26 leatherbacks (CV=0.98, 95% CI over all years: 0-79), and 32 unidentified hard-shelled turtles (CV=0.59, 95% CI over all years: 0-75). Of these, mortalities were estimated at 88 loggerheads, 56 Kemp's ridleys, 30 greens, 16 leatherbacks, and 20 unidentified hard-shelled turtles (Murray 2023). Total estimated loggerhead (Northwest Atlantic DPS) interactions was equivalent to 2.5 adults (Murray 2023). The highest loggerhead turtle interaction rate occurred in the northern Mid-Atlantic strata in large mesh gear from July-October (Murray 2023). Relative to loggerheads, all other species' interaction rates were lower (Murray 2023).

[11] Precoda and Murray (2024) estimate species-specific interaction rates using the same stratification scheme as in Murray (2020).

[12] This range was expanded from previous years to include the Gulf of Maine in addition to Georges Bank and the Mid-Atlantic Ecological Production Units (Murray 2023).

5.6.4.2.2 Atlantic Sturgeon

Sink Gillnet and Bottom Trawl Gear

The ASMFC (2017), Miller and Shepard (2011), NMFS (2021a), Boucher and Curti (2023) and the most recent ten years of NMFS observer data (i.e., 2013-2022; NMFS NEFSC observer/sea sampling database, unpublished data) describe the observed or documented interactions between Atlantic sturgeon and bottom trawl and gillnet gear in the GAR. For sink gillnets, higher levels of Atlantic sturgeon bycatch have been associated with depths under 40 m, mesh sizes over ten inches, and the months of April and May ASMFC (2007). For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch has been associated with depths under 30 m. More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic surgeon, with Atlantic sturgeon encountered primarily at depths under 20 m (ASMFC 2017).

Boucher and Curti (2023) updated the estimate of Atlantic sturgeon bycatch that was presented in the ASMFC (2017) Atlantic sturgeon benchmark stock assessment for the annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl, gillnet). The assessment analyzed fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2021 (excluding 2020 due to COVID-related impacts on data collection). The total bycatch of Atlantic sturgeon from bottom otter trawls was between 638-836 fish over 2016-2021 (excluding 2020 due to COVID-related impacts on data collection), while the total bycatch of Atlantic sturgeon from gillnets ranged from 1,031-1,268 fish. The estimated average annual bycatch during 2016-2021 of Atlantic sturgeon in bottom otter trawl gear is 718.4 individuals and in gillnet gear is 1,125.4 individuals. However, the estimate of Atlantic sturgeon bycatch in Boucher and Curti (2023) for 2016-2021 includes take of all Atlantic sturgeon, including non-listed fish that originate in Canadian waters but occur within the affected environment of this action. Partitioning out the fish that were likely of Canadian origin, NOAA fisheries concluded that the total bycatch of ESA-listed Atlantic sturgeon, only, during 2016-2021 in bottom otter trawl gear is 712 individuals and in gillnet gear is 1,115 individuals.

5.6.4.2.3 Atlantic Salmon

Sink Gillnet and Bottom Trawl Gear

Atlantic salmon are at risk of interacting with bottom trawl or gillnet gear (NEFSC observer/sea sampling database, unpublished data; Kocik *et al*. 2014; NMFS 2021a). Northeast Fisheries Observer Program (NEFOP) data from 1989-2023 show records of incidental bycatch of Atlantic salmon in seven of the 34 years, with a total of 15 individuals caught, nearly half of which (seven) occurred in 1992 (NMFS NEFSC observer/sea sampling database, unpublished data)[13]. Of the observed incidentally caught Atlantic salmon, ten were listed as "discarded," which is assumed to be a live discard (Kocik, pers comm.; February 11, 2013). Five of the 15 were documented as lethal interactions. The incidental takes of Atlantic salmon occurred in bottom otter trawls (4) and gillnets (11). Observed captures occurred in March (2), April (2), May (1), June (3), August (1), and November (6). Given the very low number of observed Atlantic salmon interactions in gillnet and bottom trawl gear, interactions with

[13] There is no information available on the genetics of these bycaught Atlantic salmon, so it is not known how many of them were part of the GOM DPS. It is likely that some of these salmon, particularly those caught south of Cape Cod, may have originated from the stocking program in the Connecticut River. Those Atlantic salmon caught north of Cape Cod and/or in the Gulf of Maine are more likely to be from the GOM DPS.

these gear types are believed to be rare in the Greater Atlantic Region (GAR) (see also McAfee 2024).

5.6.4.2.4 Giant Manta Ray

Sink Gillnet and Bottom Trawl Gear

Giant manta rays are potentially susceptible to capture by bottom trawl and gillnet gear based on records of their capture in fisheries using these gear types (NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a). Review of the most recent 10 years of NEFOP data showed that between 2014-2023, nine (unidentified) giant manta rays were observed in bottom trawl gear and two were observed in gillnet gear (NMFS NEFSC observer/sea sampling database, unpublished data). Additionally, reviewing NEFOP data collected since 1989, although most observed interactions with giant manta rays did not record the condition of the animal, several cases had documentation that the animal was released alive. While there is currently no information on post-release survival, NMFS Southeast Gillnet Observer Program observed a range of 0 to 16 giant manta rays captured per year between 1998 and 2015 and estimated that approximately 89% survived the interaction and release (see NMFS reports available at: http://www.sefsc.noaa.gov/labs/panama/ob/gillnet.htm). Other sources, however, suggest that giant manta rays experience high at-vessel and post-release mortality because of they are obligate ram ventilators (Marshall et al. 2022; NMFS 2024). In the giant manta ray draft Recovery Plan, NMFS states that commercial trawl fisheries pose a low-moderate extinction risk for the species, and commercial gillnet fisheries pose a low threat (NMFS 2024).

5.6.4.2.5 Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or pot/trap gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2024 LOF (89 FR 12257, February 16, 2024) categorizes commercial sink gillnet fisheries (Northeast and Mid-Atlantic) as a Category I fishery; and bottom trawl fisheries (Northeast or Mid-Atlantic) as a Category II fishery.

5.6.4.2.5.1 Large Whales

Bottom Trawl Gear

Documented interactions between large whales and bottom trawl gear are infrequent. Review of the most recent 10 years of information on large whale entanglement in fishing gear indicates that between 2013-2022, there has been one confirmed entanglement case between a humpback whale and a full trawl net[14]. In 2020, a live, humpback whale was anchored/entangled in fishing gear, later identified by NMFS as trawl net. The animal was disentangled by trained responders from the Atlantic Large Whale Disentanglement Network. Given the disentanglement efforts, gear was removed and recovered from the

[14] GAR Marine Animal Incident Database (unpublished data); NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region; NMFS Atlantic Large Whale Entanglement Reports; MMPA List of Fisheries (LOF)

animal, resulting in the whale being released alive, with non-serious injuries. Additional information on this incident can be found in the 2020 Atlantic Large Whale Entanglement Report and Henry et al. 2023.

Sink Gillnet Gear

Large whale interactions (entanglements) with fishing gear have been observed and documented in the waters of the Northwest Atlantic[15]. Information available on all interactions (e.g., entanglement, vessel strike, unknown cause) with large whales comes from reports documented in the GAR Marine Animal Incident Database (unpublished data). The level of information collected for each case varies, but may include details on the animal, gear, and any other information about the interaction (e.g., location, description, etc.). Each case is evaluated using defined criteria to assign the case to an injury/information category using all available information and scientific judgement. In this way, the injury severity and cause of injury/death for the event is evaluated, with serious injury and mortality determinations issued by the NEFSC[16].

Based on the best available information, the greatest entanglement risk to large whales is posed by fixed gear used in trap/pot or sink gillnet fisheries (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry 2013; Kenney and Hartley 2001; Knowlton and Kraus 2001; Hartley et al. 2003; Johnson et al. 2005;Whittingham et al. 2005a,b; Knowlton et al. 2012; NMFS 2021a,b; Hamilton and Kraus 2019; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024; Sharp et al. 2019; Pace et al. 2021; see NMFS Marine Mammal SARs for the Atlantic Region). Specifically, while foraging or transiting, large whales are at risk of becoming entangled in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, as well as the net panels of gillnet gear that rise into the water column (Baumgartner et al. 2017; Cassoff et al. 2011; Cole and Henry 2013; Hamilton and Kraus 2019; Hartley et al. 2003; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024; Johnson et al. 2005; Kenney and Hartley 2001; Knowlton and Kraus 2001;Knowlton et al. 2012; NMFS 2021a,b; Whittingham et al. 2005a,b; see NMFS Marine Mammal SARs for the Atlantic Region)[17]. Large whale interactions (entanglements) with these features of trap/pot and/or sink gillnet gear often result in the serious injury or mortality to the whale (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry 2013; Henry et al. 2014, Henry et al. 2015, Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Henry et al. 2023; Henry et al. 2024; Knowlton and Kraus 2001, Knowlton et al. 2012; Moore and Van der Hoop 2012; NMFS 2014; NMFS 2021a,b; Pettis et al. 2021; Sharp et al. 2019; van der Hoop et al. 2016; van der Hoop et al. 2017). In fact, according to NMFS (2021b), review of Atlantic coast-wide causes of large whale human interaction incidents showed that entanglement is the highest cause of mortality and serious injury for North Atlantic right, humpback, fin, and minke whales in those instances when cause of death could be determined. As many entanglements, and therefore, serious injury or mortality events, go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, the rate of large whale entanglement, and thus, rate of serious injury and mortality due to entanglement, are likely

[15] NMFS Atlantic Large Whale Entanglement Reports: For years prior to 2014, contact David Morin, Large Whale Disentanglement Coordinator, David.Morin@NOAA.gov; GAR Marine Animal Incident Database (unpublished data); NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region; NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations reports; MMPA List of Fisheries; NMFS 2021a,b.

[16] NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations reports

[17] Through the ALWTRP, regulations have been implemented to reduce the risk of entanglement in in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, as well as the net panels of gillnet gear. ALWTRP regulations currently in effect are summarized online.

underestimated (Hamilton et al. 2018; Hamilton et al. 2019; Knowlton et al. 2012; NMFS 2021a,b; Pace et al. 2017; Robbins 2009).

As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the Northwest Atlantic Ocean. As fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA. Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear[18]. In 1997, the ALWTRP was implemented; however, since 1997, it has been modified several times as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In 2021, adjustments to the ALWTRP were implemented and are summarized online.

The ALWTRP consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries. The ALWTRP recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S, and identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.[19]. For further details on the Plan, please refer to the ALWTRP.

5.6.4.2.5.2 Small Cetaceans and Pinnipeds

Sink Gillnet and Bottom Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with sink gillnet and bottom trawl gear[20]. Reviewing marine mammal stock assessment and serious injury reports that cover the most recent 10 years data (i.e., 2013-2022), as well as the MMPA LOF's covering this time frame (i.e., issued between 2017 and 2024), Table 17 provides a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA LOF Category I (frequent interactions) gillnet and/or Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the Northeast multispecies fishery. The most recent estimate (2022) of small cetacean and pinniped bycatch in gillnet gear indicates that gray seals, followed by harbor seals, harbor porpoises, and short beaked common dolphins are the most frequently bycaught small cetacean and pinnipeds in sink gillnet gear in the GAR; bycatch of Risso's dolphins, white sided dolphins, and harp seals are observed to a lesser extent (Precoda

[18] The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.

[19] The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet .

[20] For additional information on small cetacean and pinniped interactions, see: NMFS NEFSC marine mammal serious injury and mortality reports; NMFS Marine Mammal SARs for the Atlantic Region; MMPA LOF.

2024). In terms of bottom trawl gear, the most recent (2022) estimate of small cetacean and pinniped bycatch indicates that short beaked common dolphins, followed by gray seals, Risso's dolphins, bottlenose dolphins, white-sided dolphins, and long finned pilot whales are the most frequently bycaught small cetacean and pinnipeds in bottom trawl gear in the GAR; bycatch of harbor seals and harbor porpoises are observed to a lesser extent (Precoda and Lyssikatos 2024).

To address the high levels of incidental take of harbor porpoise and bottlenose dolphins in sink gillnet fisheries, pursuant to section MMPA Section 118(f)(1), the Harbor Porpoise Take Reduction Plan (HPTRP) and the Bottlenose Dolphin Take Reduction Plan (BDTRP) were developed and implemented for these species[21]. Also, due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid- Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy was implemented. Refer to NMFS HPTRP, NMFS BDTRP, or NMFS Atlantic Trawl Gear Take Reduction Strategy for addition information on each take reduction plan or strategy.

Table 17 – Small cetacean and pinniped species observed seriously injured and/or killed by Category I and II sink gillnet or bottom trawl fisheries in the affected environment of the Northeast multispecies fishery.

Fishery	Category	Species Observed or Reported Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (Western North Atlantic (WNA) offshore)
		Bottlenose dolphin (Norther Migratory coastal)
		Harbor porpoise (Gulf of Maine (GME)/Bay of Fundy (BF))
		Atlantic white sided dolphin (WNA)
		Short-beaked common dolphin (WNA)
		Risso's dolphin (WNA)
		Long-finned pilot whales
		Harbor seal (WNA)
		Hooded seal
		Gray seal (WNA)
		Harp seal (WNA)
Mid-Atlantic Gillnet	I	Bottlenose dolphin (Northern Migratory coastal)
		Bottlenose dolphin (Southern Migratory coastal)
		Bottlenose dolphin (Northern North Carolina (NC) estuarine system)

[21] Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal SARs (Hayes et al. 2022) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

Fishery	Category	Species Observed or Reported Injured/Killed
		Bottlenose dolphin (Southern NC estuarine system)
		Bottlenose dolphin (WNA offshore)
		Common dolphin (WNA)
		Harbor porpoise (GME/BF)
		Short-beaked common dolphin
		Harbor seal (WNA)
		Hooded seal (WNA)
		Harp seal (WNA)
		Gray seal (WNA)
Northeast Bottom Trawl	II	Harp seal (WNA)
		Harbor seal (WNA)
		Gray seal (WNA)
		Long-finned pilot whales (WNA)
		Short-beaked common dolphin (WNA)
		Atlantic white-sided dolphin (WNA)
		Harbor porpoise (GME/BF)
		Bottlenose dolphin (WNA offshore)
		Risso's dolphin (WNA)
Mid-Atlantic Bottom Trawl	II	White-sided dolphin (WNA)
		Short-beaked common dolphin (WNA)
		Risso's dolphin (WNA)
		Bottlenose dolphin (WNA offshore)
		Gray seal (WNA)
		Harbor seal (WNA)
Source: NMFS Marine Mammal SARs for the Atlantic Region; MMPA 2017-2024 LOFs.		

5.7 HUMAN COMMUNITIES

This EA considers and evaluates the effect management alternatives may have on people's way of life, traditions, and community. These economic and social impacts may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. While it is possible that these impacts could be solely experienced by individual fishermen, it is more likely that impacts would be experienced across communities, gear types, and/or vessel size classes. This section reviews the Northeast multispecies fishery and describes the human communities potentially impacted by the Proposed Action. This includes a description of the sector, common pool, and recreational participants' groundfish fishing and the important port communities in the fishery. This section focuses on the groundfish component of fishery participants activities and generally does not report out revenue or landed pounds landed on trips other than groundfish trips. Additional information may be found in the FY2010, FY2011, FY2012, FY2013, and FY2015 performance reports for this fishery by the NEFSC (Kitts et al. 2011; Murphy et al. 2012; Murphy et al. 2014; Murphy et al. 2015; Murphy et al. 2018). Previous groundfish management actions (FW61, FW63, FW65, FW66, A23) also contain fishery data descriptions from fishing years prior to 2019. Generally, fishery data in this section comes from the Catch Accounting and Management System (CAMS) tables, but other tables may use information from other sources, as noted. As FW69 is the first groundfish specifications action to utilize CAMS for this section, some numbers may vary slightly in comparison to previous management actions.

5.7.1 Groundfish Fishery Overview

Sectors are allocated subdivisions of ACLs called Annual Catch Entitlements (ACE) based on each sector's collective catch history[22]. Sectors have received ACE for nine of 13 groundfish species (15 stocks + quotas for Eastern US/Canada cod and haddock; 17 ACEs) in the FMP and are exempt from many of the effort controls previously used to manage the fishery. Beginning in FY2026, sectors will be allocated 19 ACEs with the transition from two cod stocks to four.

Each sector establishes its own rules for using its allocations. As of FY2023, 53% of the limited access groundfish permitted vessels are in a sector, and 47% are in the common pool (Table 18) [23]. Common pool vessels act independently of one another, with each vessel constrained by the number of DAS it can fish, by trip limits, and by all of the time and area closures. These restrictions help ensure that the groundfish catch of common pool vessels does not exceed the common pool's portion of the commercial groundfish sub- ACL for all stocks (about 1% in recent fishing years) before the end of the fishing year. In this section, "groundfish trips", unless otherwise stated, are defined as vessels with a limited access groundfish permit that landed at least 1 pound of any stock on a trip that declared into the groundfish fishery. Groundfish landings only refer to landing stocks that are allocated species in the Northeast Multispecies plan (cod, haddock, pollock, redfish, yellowtail flounder, witch flounder, American plaice, etc.), but may have been caught on either sector or common pool trips. Non-groundfish landings include all other species caught, including whiting, lobster, skates, dogfish, and any other federally reported catch.

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[22] To determine the ACE, the sum of all of the sector members' potential sector contributions (PSCs) (a percentage of the ACL) are multiplied by the ACL.

[23] The number of LA permits overall has changed relatively little since the beginning of the sector program, the decline in number of vessels is due to the number of permits not currently affiliated with a vessel, but is eligible for renewal based on the previous vessels' fishing and permit history (i.e., Confirmation of Permit History, or CPH, see 50 CFR 648.4).

Table 18 – Number of eligibilities (MRIs), eligibilities in CPH, permitted vessels, and active vessels (landing on groundfish trips) by fishing year from FY2019 to FY2023.

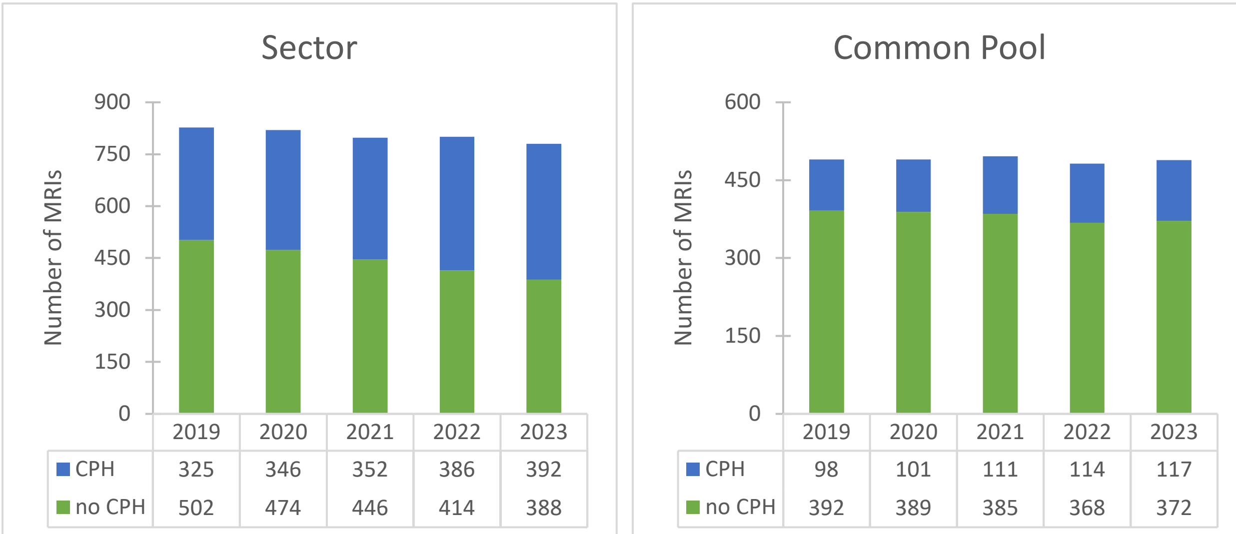
Fishing year	Group	MRIs	CPH	Elig. vessels	Not renewed	Permitted vessels	Any revenue	GF revenue	No landings	% inactive
2019	sector	827	325	543	15	528	349	157	179	34%
2019	common	490	98	401	24	377	272	43	105	28%
2020	sector	820	346	504	12	492	337	161	155	32%
2020	common	490	101	409	25	384	253	36	131	34%
2021	sector	798	352	471	9	462	311	137	149	32%
2021	common	496	111	409	22	387	249	25	137	35%
2022	sector	800	386	441	8	433	305	124	128	29%
2022	common	482	114	394	25	369	245	25	117	32%
2023	sector	780	392	435	6	429	291	115	139	32%
2023	common	489	117	400	18	382	242	30	132	35%

Total MRIs = MRIs not in CPH + those in CPH
Total MRIs and those in CPH represent the number of MRIs not in CPH and those in CPH as of May 1st of the fishing year, while the total number of eligible vessels reflects the number of non-CPH eligible permits at any point in the fishing year. Over time the number of vessels will differ from the number of eligibilities since eligibilities can be transferred from vessel to vessel during the fishing year. Amendment 16 authorized CPH owners to join sectors and to lease DAS.
Source: NMFS Greater Atlantic Regional Fisheries Office, Summary tables for FY2023 Northeast Multispecies Fishery. Accessed November 2024.

5.7.2 Fleet Characteristics

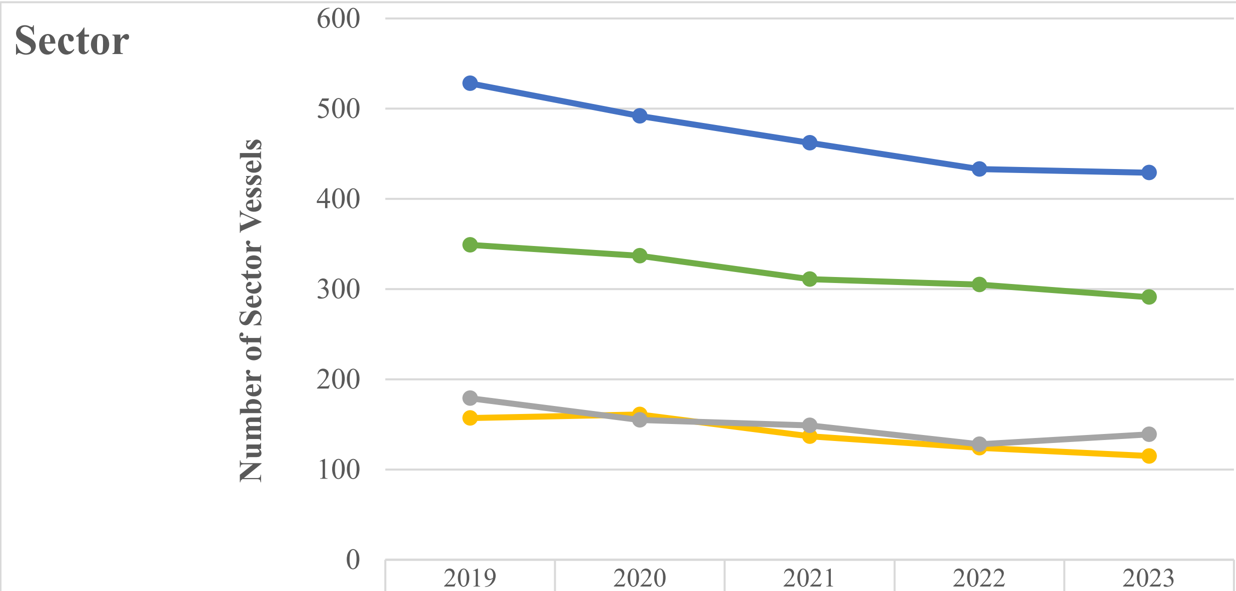
Over the past five fishing years, there has been limited variability in the number of groundfish eligibilities (Moratorium Right Identifiers, MRIs), shown in Table 18. This represents the number of individual fishing privileges and catch histories associated with each Northeast multispecies permit, through which Potential Sector Contributions (PSC) are calculated. While a given set of privileges may move from one vessel to another, and change permit numbers, the MRI always stays the same. Over time, the number of sector eligibilities in CPH (Confirmation of Permit History) has increased from 325 at the start of FY2019 to 392 in FY2023 (Figure 3). The increase of eligibilities in CPH represents a decline in the number of permits associated with vessels, but because eligibilities in CPH may still join sectors, the number of eligibilities in CPH does not necessarily change individuals' PSC, nor the ability for participants to passively obtain income from the groundfish fishery by leasing their ACE. Eligibilities may also move out of CPH during the fishing year, allowing the number of Limited Access permitted vessels to exceed the number of eligible permits at the start of the fishing year. Overall, there has been a decline in the number of permitted vessels in any year, from 905 in FY2019 to 811 in FY2023. Of these permitted vessels in FY2023, 33% were inactive, and the number of sector vessels that were inactive was slightly greater than the number of vessels landing allocated groundfish stocks (Figure 4). A key aspect of Amendment 16 is the ability of a sector to jointly decide how its ACE will be harvested, through redistribution within a sector and/or transferring ACE between sectors. Because inactive sector vessels may benefit if they lease their allocation, changes in the number of inactive vessels may result from a transfer of allocation and not necessarily vessels exiting the fishery.

Figure 3 – Number of eligibilities (MRIs) not in Confirmation of Permit History (CPH) and in CPH as of May 1 of each year.

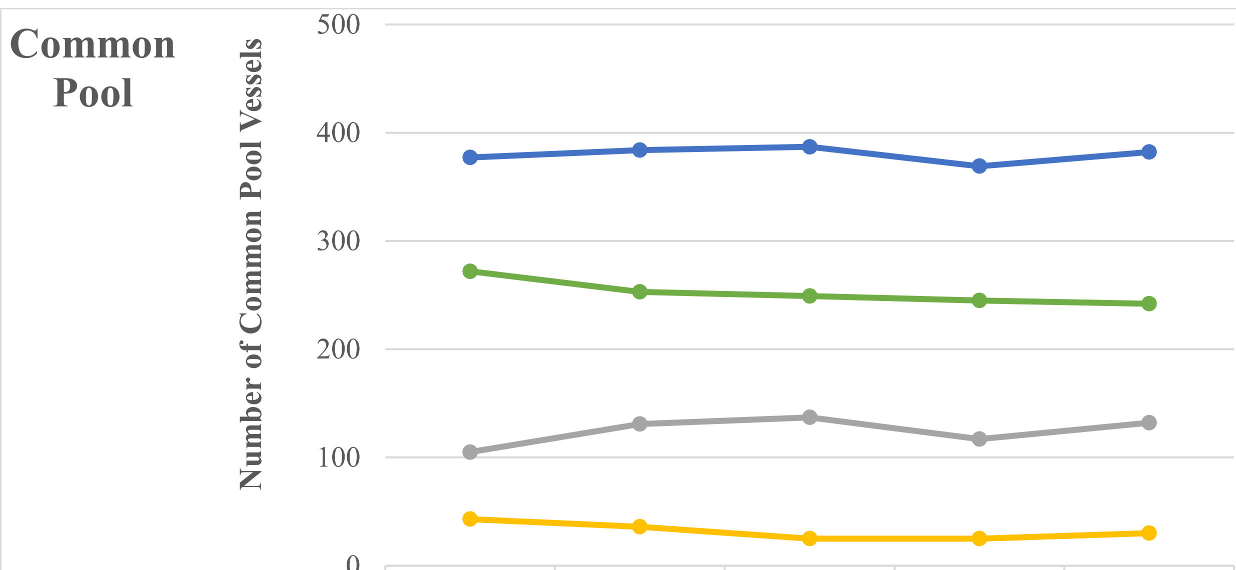


Source: NMFS Greater Atlantic Regional Fisheries Office, Summary tables for Northeast Multispecies Fishery. Accessed November 2024.

Figure 4 – At any time in the fishing year, the total number of permitted groundfish vessels, those with revenue from any species, those with no landings, and those with revenue from allocated groundfish.



	2019	2020	2021	2022	2023
All permitted vessels	528	492	462	433	429
Revenue from any species	349	337	311	305	291
Revenue from groundfish	157	161	137	124	115
No landings	179	155	149	128	139



	2019	2020	2021	2022	2023
All permitted vessels	377	384	387	369	382
Revenue from any species	272	253	249	245	242
Revenue from groundfish	43	36	25	25	30
No landings	105	131	137	117	132

Source: NMFS Greater Atlantic Regional Fisheries Office, Summary tables for Northeast Multispecies Fishery. Accessed November 2024.

5.7.3 **Effort**

The groundfish fishery has traditionally been made up of a diverse fleet, comprised of a range of vessel sizes and gear types. The number of active vessels has declined somewhat since FY2019 across size classes (Table 19). From FY2019 to FY2023, the <50' vessel size category declined from 92 to 60 active sector vessels. The common pool had 35 vessels in the same size class in 2019, while only 28 were active in 2023. Active vessels in the 50' to 75' vessel size category have also declined, from a maximum of 54 sector vessels in 2020 to 32 vessels in 2023. The number of sector vessels >75' has slightly increased from 28 vessels in 2019 to 32 in 2023[24].

Figure 5 shows for each vessel size class, total landed pounds (groundfish and non-groundfish), total gross ex-vessel revenue, total number of days absent on groundfish trips, and total number of groundfish trips. Total pounds landed (groundfish and non-groundfish) on groundfish trips decreased in 2023 to a five-year low. Total gross revenue (groundfish and non-groundfish) from groundfish trips in 2023 also decreased to a five-year low. Primary gear types in the groundfish fishery are trawls (primarily otter trawls) and gillnet, but several other gear types including handline, longline, and pot gear may be used on groundfish trips, even if not used primarily to target groundfish stocks (Table 21).

Table 19 – Number of active permitted vessels by length class, group and fishing year.

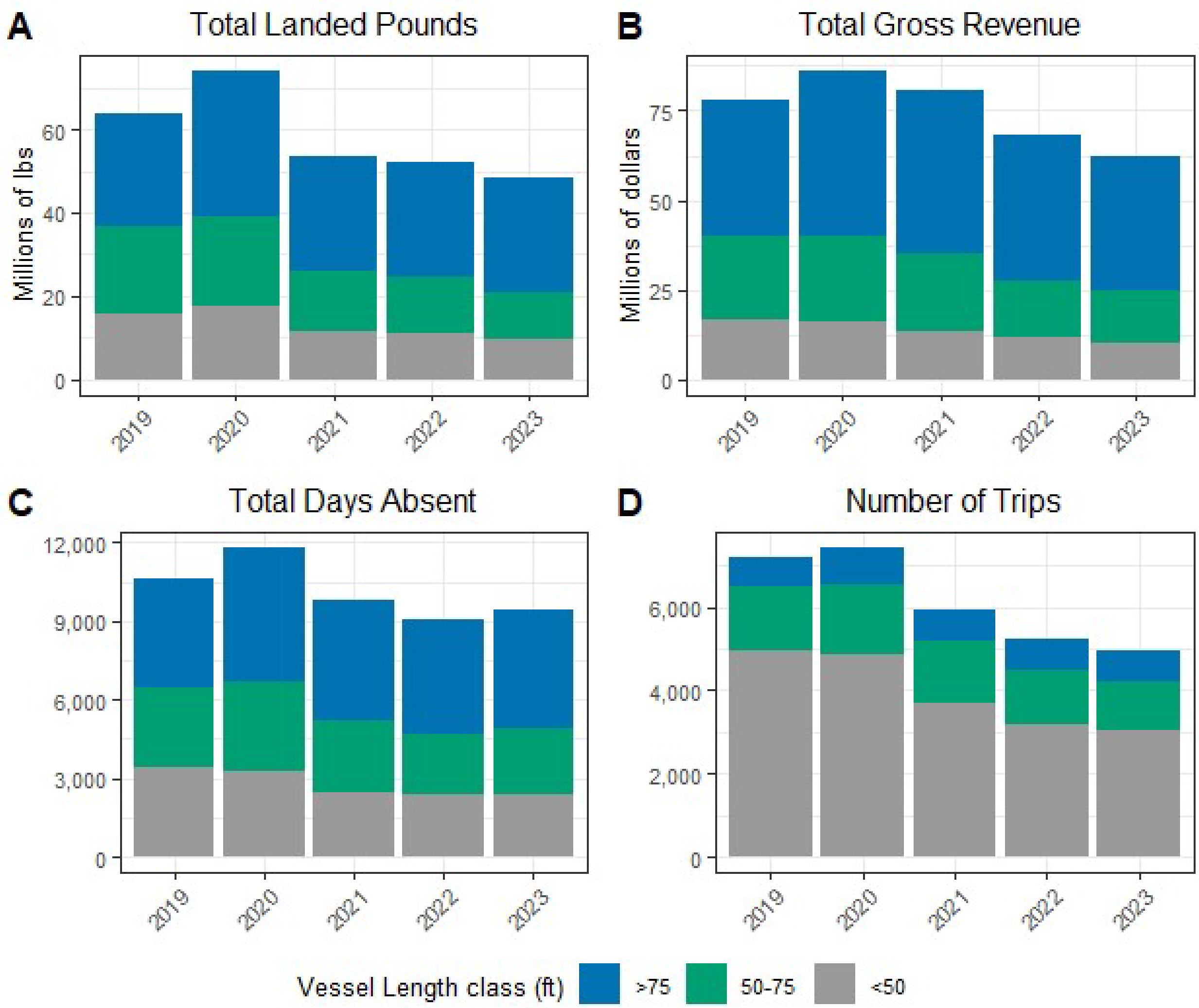
Fishing year	Group	<50 ft.	50-75 ft.	> 75 ft.
2019	common pool	35	6	0
2019	sector	92	47	28
2020	common pool	31	5	0
2020	sector	82	54	36
2021	common pool	26	4	0
2021	sector	72	45	30
2022	common pool	26	4	1
2022	sector	65	39	31
2023	common pool	28	6	0
2023	sector	60	32	32

"C" indicates confidential data.

Source: CAMS data. Accessed October 2024

[24] The lower number of active vessels in the >=75 ft size class for the 2019 fishing years can be partially attributed to the forfeiture of groundfish vessels by Carlos Rafael in 2017. These vessels reentered the groundfish fishery in 2020.

Figure 5 – For vessel length category- (A) Total landed pounds (groundfish and non-groundfish); (B) Total gross ex-vessel revenue (millions of $2023); (C) Total number of days absent on groundfish trips; and (D) Total number of groundfish trips.



Source: CAMS data. Accessed October 2024

Table 20 – Number of groundfish trips by permitted vessels and gear type used.

Fishing year	Group	Trawl	Gillnet	ELM	Handline	Longline	Pot	Other
2019	common pool	273	73	80	88	1	2	0
2019	sector	3704	1376	2034	130	143	24	2
2020	common pool	368	28	38	86	0	0	1
2020	sector	4197	1262	1935	78	146	18	4
2021	common pool	251	6	32	37	0	2	0
2021	sector	3601	899	1377	33	56	28	0
2022	common pool	284	70	35	63	1	5	0
2022	sector	2994	817	1286	16	41	8	0
2023	common pool	242	42	76	80	4	6	0
2023	sector	2850	524	1362	14	33	9	24

"C" indicates confidential data.

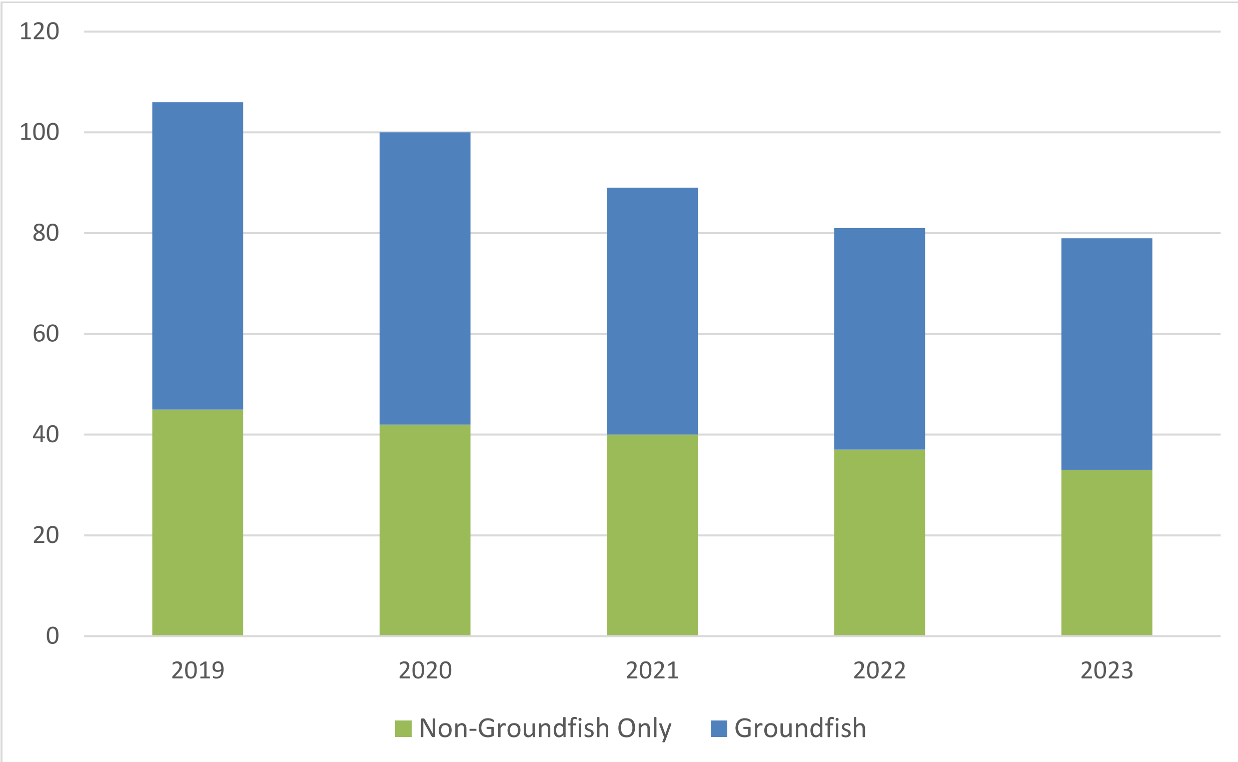
Source: CAMS data. Accessed October 2024

5.7.4 Dealer Activity

All federally permitted groundfish vessels are required to sell to a federally permitted dealer. Federally permitted dealers are required to report all purchases of seafood, regardless of whether the vessels held a Federal or state-waters only permit. Dealers may obtain product from many other sources, so the groundfish activity levels are likely to capture only a portion of business activity by seafood wholesalers. Since 2019, the number of registered dealers that reported buying allocated groundfish decreased from 61 in 2019, down to 46 dealers in 2023. The number of dealers buying any species on groundfish trips has decreased from 106 dealers in 2019, to 79 dealers in 2023 (Figure 6).

Where the dealer is registered, similar to homeport, may better represent where revenue ultimately flows in the country, while the location of sale best represents where fish is landed, either to a truck, an auction, or a processing facility (see landings and revenue section). Table 21 shows the number of dealers by registered state, specifically those buying any allocated groundfish species from groundfish trips. Massachusetts has the most registered dealers each year, but that number has declined since 2019.

Figure 6 – Number of registered dealers buying groundfish or any species from groundfish trips between fishing years 2019 and 2023.



Source: CAMS data. Accessed October 2024

Table 21 – Number of Registered Dealers reporting buying allocated groundfish by registered state and fishing year. Total by state may not be accurate since registrations may vary by calendar year.

Registered Dealer State	2019	2020	2021	2022	2023
MA	34	27	23	22	24
ME	11	9	14	10	8
NH	6	9	7	4	C
RI	10	9	7	9	10
OTHER	15	17	9	12	11

Source: CAMS data. Accessed October 2024

5.7.5 Landings and Revenue

Table 22 and Figure 6 – Figure 8 summarize major landings and revenue trends for the groundfish fishery over the last five fishing years. Landed pounds of groundfish decreased slightly from 2022 to a five-year low in 2023. Groundfish revenue also decreased in 2023 to a five-year low.

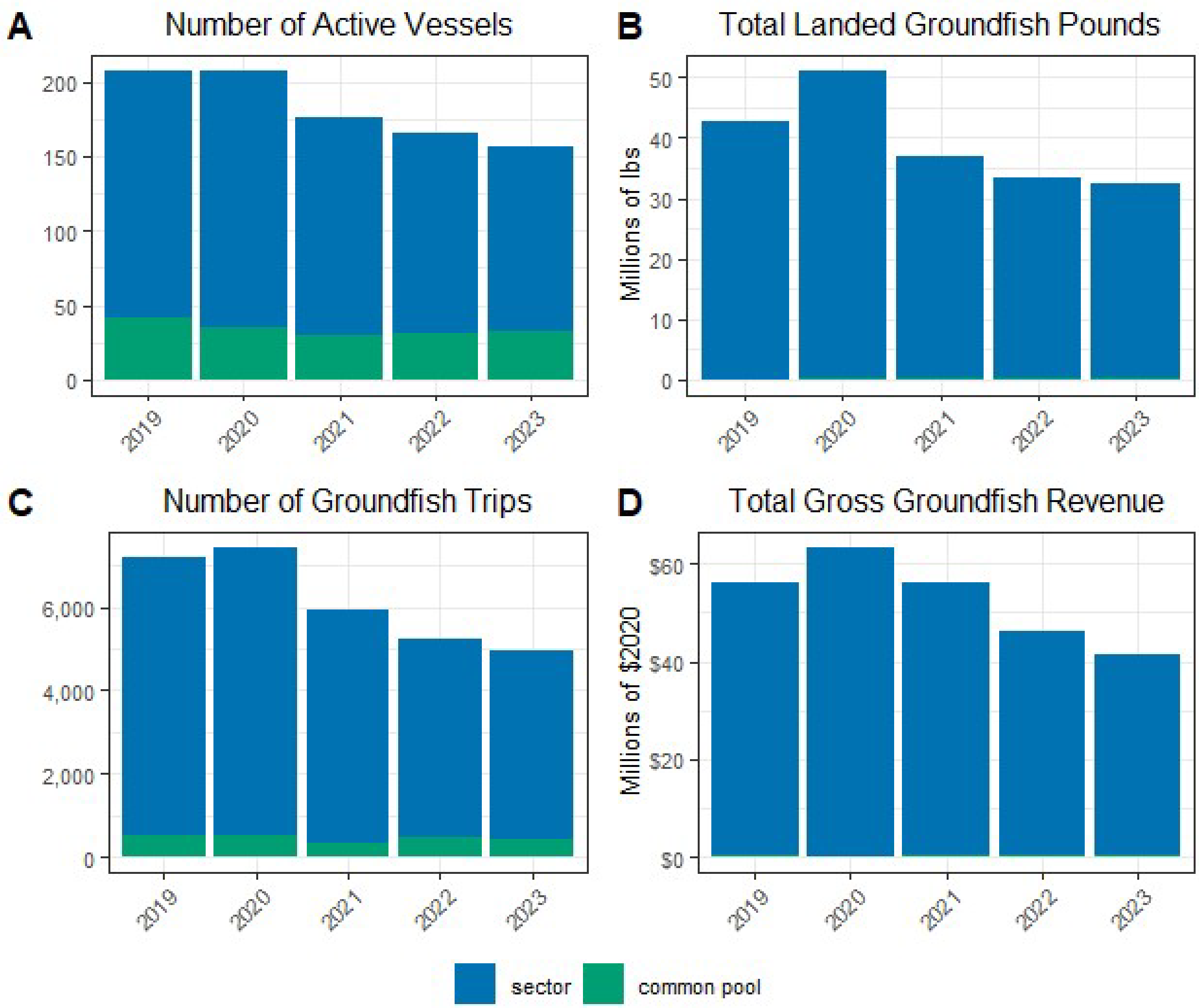
The average price of regulated groundfish landed on groundfish trips from sector vessels was $1.28/lb. in 2023, representing a decline relative to 2022. The average non-groundfish price for sector vessels increased in 2023 ($1.45/lb.) compared to 2022.

Table 22 – Summary of major trends in the Northeast multispecies fishery by fishing year and group ($2023). Pounds and revenue reflect total landings (landed lbs.) on groundfish trips in millions of pounds/dollars.

Fishing year	Group	GF pounds	GF revenue	GF price	NGF pounds	NGF revenue	NGF price	Vessels	Trips	Days absent
2019	common pool	0.10	0.27	2.55	1.56	1.04	0.66	41	516	312
2019	sector	42.45	55.76	1.31	19.66	20.91	1.06	167	6,694	10,297
2020	common pool	0.11	0.18	1.56	2.02	1.00	0.50	35	515	317
2020	sector	51.08	63.24	1.24	20.94	21.89	1.05	172	6,926	11,498
2021	common pool	0.12	0.24	1.94	1.29	0.88	0.68	30	326	235
2021	sector	36.76	55.89	1.52	15.46	23.61	1.53	146	5,625	9,586
2022	common pool	0.19	0.42	2.23	2.51	1.35	0.54	31	454	365
2022	sector	33.07	45.72	1.38	16.25	20.55	1.27	135	4,769	8,697
2023	common pool	0.19	0.34	1.77	2.37	1.35	0.57	33	419	509
2023	sector	32.34	41.26	1.28	13.23	19.13	1.45	124	4,549	8,913

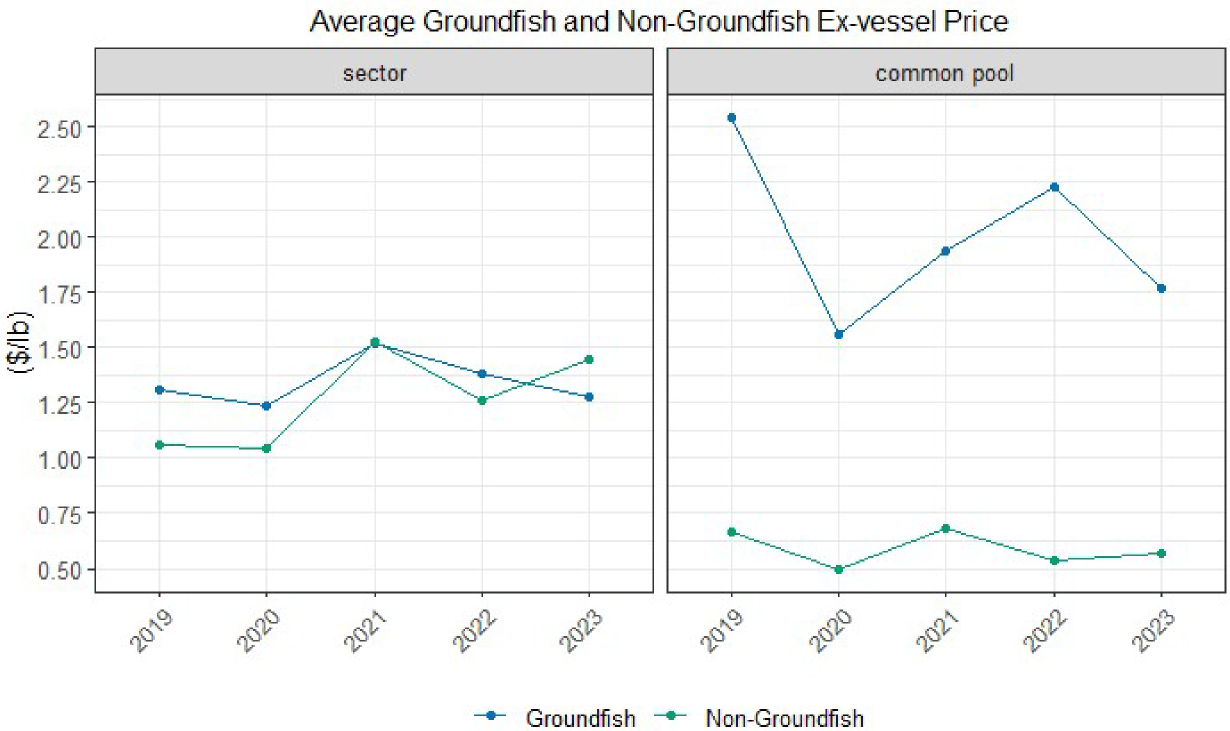
Source: CAMS data. Accessed October 2024

Figure 7 – (A) Number of active (at least one groundfish trip) vessels by fishing year and group; (B) Total landed pounds of allocated groundfish stocks; (C) Number of groundfish trips with >1 lb landed of any species ; (D) Total ex-vessel revenue from allocated groundfish stocks ($2023).



Source: CAMS data. Accessed October 2024.

Figure 8 – Average groundfish and non-groundfish price ($2023) by fishing year.



Source: CAMS data. Accessed October 2024.

Table 23 shows the distribution of groundfish landings by dealer state. Over FY2019 – FY2023, Massachusetts made up the vast majority of groundfish landings. Similar distributions are shown for groundfish revenue by dealer state (Table 24). More detailed information on groundfish landings and revenue by state is provided in Section 5.7.7.

Table 23 – Share of allocated groundfish landings by dealer sale state FY2019-2023.

Dealer Sale State	2019	2020	2021	2022	2023
MA	0.95	0.96	0.96	0.94	0.94
ME	0.04	0.02	0.02	0.05	0.05
NH	0.01	0.02	0.02	0.01	<0.01
RI	<0.01	<0.01	<0.01	<0.01	<0.01
OTHER	<0.01	<0.01	<0.01	<0.01	<0.01

Source: CAMS data. Accessed October 2024.

Table 24 – Share of allocated groundfish revenue by dealer sale state FY2019 – 2023.

Dealer Sale State	2019	2020	2021	2022	2023
MA	0.92	0.94	0.94	0.92	0.92
ME	0.05	0.03	0.03	0.07	0.07
NH	0.02	0.02	0.02	0.01	0.01
RI	0.01	<0.01	<0.01	<0.01	<0.01
OTHER	<0.01	<0.01	<0.01	<0.01	<0.01

Source: CAMS data. Accessed October 2024.

Recent ex-vessel prices by stock are shown in Table 25 and revenue by stock in Table 26. Table 27 shows the distribution of groundfish revenue by area among the largest groundfish ports. New Bedford is the top port of landing for GB and SNE stocks, while Gloucester and Boston/Scituate are the top ports for GOM stocks. Boston and Scituate were combined for data confidentiality purposes, though the nature of trips between the ports is quite different. A majority of trips landing in Boston are associated with the Gulf of Maine, though significant landings from Georges Bank also occur. Scituate is nearly entirely associated with Gulf of Maine trips. Map 3 identifies the four broad stock areas used in the fishery, referred to above.

Table 25 – Stock-level commercial (sector and common pool) ex-vessel prices (2023$/lb.), FY2019 – 2023. Averages represent total value divided by total landings over the five-year period.

Stock	2019	2020	2021	2022	2023	Avg.
EGOM Cod	3.92	3.35	3.43	3.26	3.39	3.59
GB Cod	2.97	2.65	2.33	1.94	2.05	2.54
SNE Cod	3.41	2.89	2.74	3.86	2.41	3.05
WGOM Cod	3.44	3.10	2.64	2.55	2.29	2.85
GB Haddock	1.24	1.27	1.61	1.82	1.39	1.40
GOM Haddock	1.44	1.44	1.81	1.68	1.45	1.57
Halibut	7.60	7.00	8.03	7.63	6.89	7.42
White Hake	1.47	1.68	1.98	1.82	1.68	1.72
Plaice	2.07	1.95	1.95	1.48	1.50	1.73
Pollock	1.11	1.30	1.65	1.27	1.38	1.34
Redfish	0.63	0.62	0.65	0.72	0.68	0.66
GB Winter Flounder	3.45	2.38	3.10	2.38	2.13	2.75
GOM Winter Flounder	2.74	2.50	2.63	1.71	1.74	2.18
SNEMA Winter Flounder	3.14	2.32	2.96	1.98	1.90	2.64
Witch Flounder	2.09	1.85	1.80	1.60	1.35	1.72
GB Yellowtail Flounder	2.28	1.56	1.57	1.65	0.84	1.77
CCGOM Yellowtail Flounder	1.34	1.04	0.96	0.79	0.77	0.94
SNEMA Yellowtail Flounder	2.10	1.05	1.82	1.25	1.18	1.06

Table 26 – Stock-level commercial (sector and common pool) revenue (millions of 2023$), FY2019 – 2023.

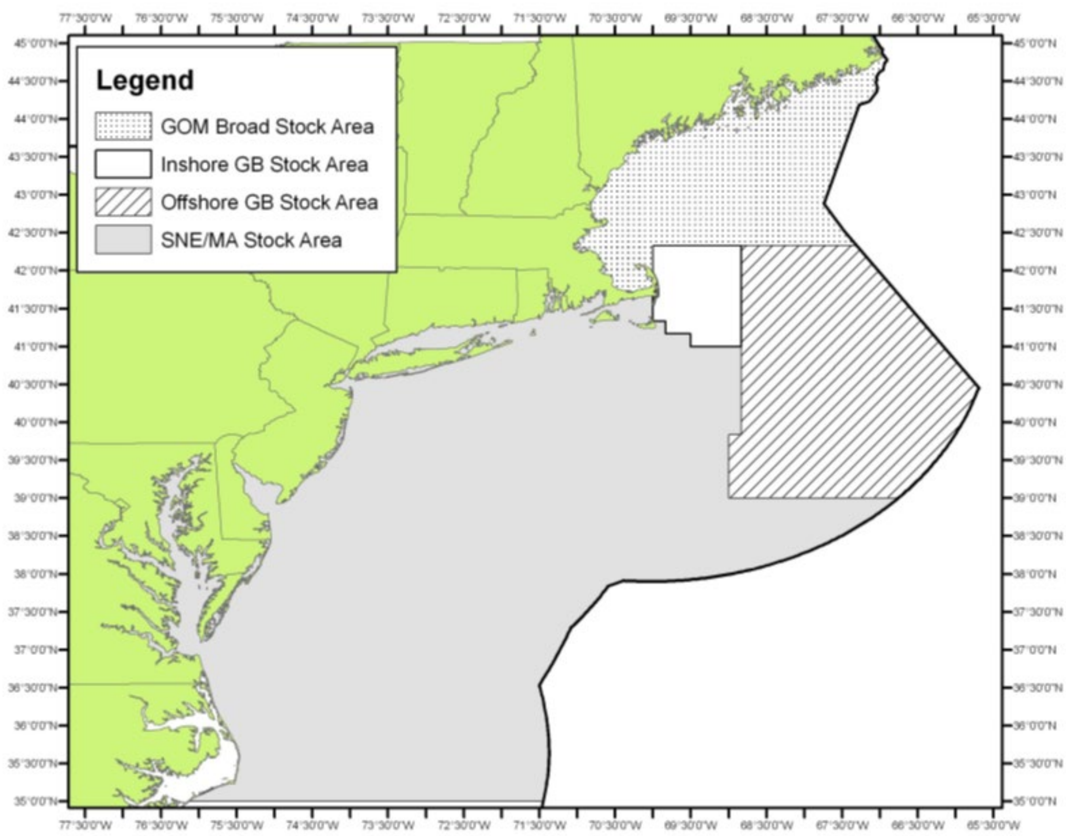
Stock	2019	2020	2021	2022	2023	Avg.
EGOM Cod	0.0	0.0	0.0	0.0	0.0	0.0
GB Cod	1.3	0.9	0.8	0.3	0.3	0.7
SNE Cod	0.0	0.0	0.0	0.0	0.0	0.0
WGOM Cod	3.6	2.6	2.5	1.5	1.9	2.4
GB Haddock	12.1	15.5	9.5	8.0	7.0	10.4
GOM Haddock	9.6	11.1	11.9	8.8	3.5	9.0
Halibut	0.4	0.4	0.3	0.2	0.2	0.3
White Hake	4.9	5.0	6.2	5.5	4.8	5.3
Plaice	3.6	2.4	2.7	2.7	4.3	3.1
Pollock	6.5	9.7	9.6	8.6	8.9	8.7
Redfish	6.8	9.2	6.2	6.0	5.7	6.8
GB Winter Flounder	2.3	1.5	1.8	0.8	1.0	1.5
GOM Winter Flounder	0.3	0.3	0.4	0.3	0.4	0.3
SNEMA Winter Flounder	1.0	0.5	0.4	0.3	0.1	0.5
Witch Flounder	3.3	3.5	3.3	2.7	3.1	3.2
GB Yellowtail Flounder	0.0	0.0	0.0	0.0	0.0	0.0
CCGOM Yellowtail Flounder	0.4	0.4	0.6	0.4	0.4	0.4
SNEMA Yellowtail Flounder	0.0	0.5	0.0	0.0	0.0	0.1

Table 27 – Commercial (sector and common pool) groundfish revenue (from all groundfish sub-trips) to Georges Bank and Southern New England/Mid-Atlantic and the Gulf of Maine. FY2019 – 2023. Revenue in millions of 2023 dollars. Ports shown each contain at least 5% of revenue for the broad stock area.

GB and SNE/MA	2019	2020	2021	2022	2023	AVG	Avg. % of Total
Boston & Scituate	2.5	4.5	2.3	2.2	4.5	3.2	15.0%
Gloucester	6.3	5.1	5.7	3	4.4	4.9	22.7%
New Bedford	13.7	17.4	13.1	10.7	9.6	12.9	60.0%
Other	1	0.6	0.5	0.2	0.3	0.5	2.3%
Total	23.6	27.6	21.6	16.1	18.9	21.5	

GOM	2019	2020	2021	2022	2023	AVG	Avg. % of Total
Boston & Scituate	12.1	10.9	11.5	9.1	7.8	10.3	33.0%
Gloucester	15.8	16.0	14.0	11.2	8.2	13.0	41.8%
New Bedford	0.4	5.3	6.0	6.1	3.5	4.3	13.6%
Portland	2.5	1.8	1.6	2.9	2.4	2.2	7.2%
Other	1.9	1.8	1.5	0.8	0.8	1.4	4.3%
Total	32.6	35.8	34.6	30.1	22.7	31.1	

Map 3 – Northeast Multispecies Broad Stock Areas.



5.7.6 **ACE Leasing**

Starting with allocations in FY2010, each sector was given an initial ACE determined by the pooled potential sector contribution (PSC) from each entity joining that sector. Every limited access groundfish permit also has a tracking identification number called a Moratorium Right Identifier (MRI). PSC is technically allocated to MRIs, which are subsequently linked to vessels through Northeast Multispecies limited access fishing permits. A vessel's PSC is a percentage share of the total allocation for each allocated groundfish stock based on that vessel's fishing history. Once a sector roster and associated PSC is set at the beginning of a fishing year, each sector is then able to distribute its ACE among its members. By regulation, ACE is pooled within sectors, however most sectors seem to follow the practice of assigning catch allowances to member vessels based on PSC allocations. This is an important assumption because vessels catching more than their allocation of PSC must have leased additional quota, either as PSC from within the sector or as ACE from another sector.

A hedonic price model[25] of reported inter-sector ACE leases between FY2019 and FY2023 shows quarterly price trends in ACE leasing over time (Figure 9). Missing points indicate quarters where there were no reported trades for that stock. A few stocks (e.g. GB haddock east, pollock) do not have reported

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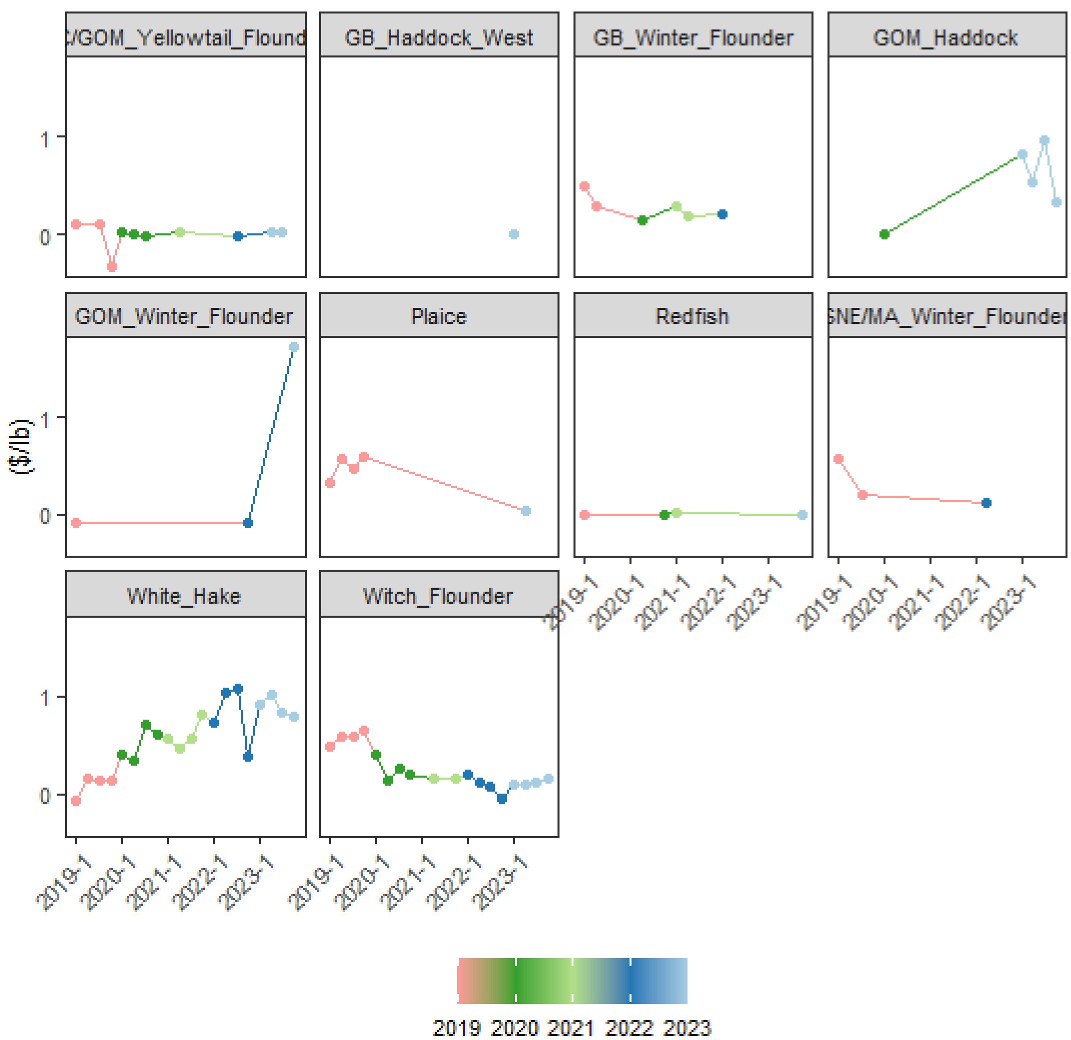
[25] A model that identifies the internal and external factors and characteristics that affect an item's price in the market. The model estimates the implicit price, or hedonic price, of these observable factors. The theoretical framework for hedonic pricing can be found in Rosen's 1974 article, "Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition".

trades, or are not associated with prices greater than $0.00, and thus are not included in the figure. Other stocks show substantial changes in price over time. ACE lease prices for white hake exhibited a generally increasing trend over the 5-year period while witch flounder lease prices have decreased relative to FY2019. GOM cod lease prices have generally been among the highest of any stock. Beginning in FY2026, the current GOM cod stock will no longer exist; much of the area will fall into the new WGOM cod stock. For information on ACE leasing in earlier years of the sector program, see the 2015 groundfish fishery performance report (Murphy, et al. 2018).

Table 28 – Table 31 provides recent average species landings and revenue within the new cod stock areas (EGOM, WGOM, GB, and SNE) to give a sense of other species landed along with cod. The majority of landings and revenue occur on groundfish trips within the WGOM cod broad stock area.

Figure 9 – Hedonic model of quarterly ACE lease prices FY2019 to FY2023 for allocated groundfish stocks.



Source: SSB model, data from GARFO inter-sector trade tables and sector year-end reports.

Table 28 – Average species landings (lbs.) and revenue within the EGOM broadstock area, declared groundfish trips, averages over fishing years 2019 – 2023.

Cod BSA	SPECIES	Species BSAs Included	AVG_LIVE_POUNDS	AVG_LANDED_POUNDS	AVG_REVENUE	REVENUE_PERCENT
EGOM	Haddock	GOM (partial)	399,600	350,327	$552,287	29.2%
EGOM	White Hake	N/A	467,607	351,064	$536,594	28.4%
EGOM	Non-Groundfish*	N/A	477,072	179,066	$391,429	20.7%
EGOM	Pollock	N/A	135,760	120,115	$145,757	7.7%
EGOM	American Plaice	N/A	62,415	62,412	$104,703	5.5%
EGOM	Witch Flounder	N/A	47,312	47,311	$70,180	3.7%
EGOM	Redfish	N/A	101,522	101,510	$62,774	3.3%
EGOM	Atlantic Halibut	N/A	3,132	2,764	$17,984	1.0%
EGOM	Cod	EGOM	2,664	2,259	$7,090	0.4%
EGOM	Yellowtail Flounder	CC/GOM (partial)	30	30	$26	0.0%
EGOM	Winter Flounder	GOM (partial)	7	7	$6	0.0%

* Largest sources of non-groundfish revenue are Monkfish, American Lobster, and Whiting

Source: CAMS (7/22/2024)

Table 29 – Average species landings (lbs) and revenue within the GB broadstock area, declared groundfish trips, averages over fishing years 2019 – 2023.

Cod BSA	SPECIES	Species BSAs Included	AVG_LIVE_POUNDS	AVG_LANDED_POUNDS	AVG_REVENUE	REVENUE_PERCENT
GB	Haddock	GB (partial)	4,250,490	3,727,540	$4,534,206	32.0%
GB	Non-Groundfish*	N/A	3,418,111	2,091,834	$4,084,412	28.8%
GB	Winter Flounder	GB	536,283	536,230	$1,317,689	9.3%
GB	Pollock	N/A	1,057,298	936,893	$1,130,130	8.0%
GB	Redfish	N/A	1,222,503	1,221,226	$783,826	5.5%
GB	Witch Flounder	N/A	390,628	390,214	$628,746	4.4%
GB	American Plaice	N/A	405,229	405,224	$618,852	4.4%
GB	Cod	GB	318,065	271,753	$617,725	4.4%
GB	White Hake	N/A	366,941	274,327	$388,746	2.7%
GB	Atlantic Halibut	N/A	9,550	8,343	$54,395	0.4%
GB	Yellowtail Flounder	GB	4,173	4,076	$6,134	0.0%

* Largest sources of non-groundfish revenue are American Lobster, Monkfish, and Skates

Source: CAMS (7/22/2024)

Table 30 – Average species landings (lbs.) and revenue within the SNE broadstock area, declared groundfish trips, averages over fishing years 2019 – 2023.

Cod BSA	SPECIES	Species BSAs Included	AVG_LIVE_POUNDS	AVG_LANDED_POUNDS	AVG_REVENUE	REVENUE_PERCENT
SNE	Non-Groundfish*	N/A	6,813,785	5,901,974	$3,167,346	94.3%
SNE	Winter Flounder	SNE/MA (partial)	63,988	63,922	$167,898	5.0%
SNE	Cod	SNE	7,576	6,324	$16,923	0.5%
SNE	Yellowtail Flounder	SNE/MA (partial)	1,637	1,490	$2,206	0.1%
SNE	American Plaice	N/A	1,630	1,630	$1,324	0.0%
SNE	Witch Flounder	N/A	551	547	$832	0.0%
SNE	Haddock	GB (partial)	427	373	$513	0.0%
SNE	White Hake	N/A	414	316	$399	0.0%
SNE	Atlantic Halibut	N/A	37	32	$233	0.0%
SNE	Pollock	N/A	71	62	$76	0.0%
SNE	Redfish	N/A	5	5	$3	0.0%

* Largest sources of non-groundfish revenue are Skates, Summer Flounder, and Monkfish

Source: CAMS (7/22/2024)

Table 31 – Average species landings (lbs.) and revenue within the WGOM broadstock area, declared groundfish trips, averages over fishing years 2019 – 2023.

Cod BSA	SPECIES	Species BSAs Included	AVG_LIVE_POUNDS	AVG_LANDED_POUNDS	AVG_REVENUE	REVENUE_PERCENT
WGOM	Non-Groundfish*	N/A	19,589,658	11,541,981	$13,061,522	26.4%
WGOM	Haddock	GB (partial); GOM (partial)	10,456,217	9,169,720	$12,605,306	25.4%
WGOM	Pollock	N/A	6,182,027	5,472,802	$6,781,577	13.7%
WGOM	Redfish	N/A	9,059,687	9,057,192	$5,372,163	10.8%
WGOM	White Hake	N/A	3,258,242	2,456,394	$3,962,200	8.0%
WGOM	Witch Flounder	N/A	1,431,906	1,431,585	$2,217,929	4.5%
WGOM	Cod	WGOM	999,055	853,661	$2,200,952	4.4%
WGOM	American Plaice	N/A	1,353,325	1,353,175	$2,180,109	4.4%
WGOM	Winter Flounder	GOM (partial); SNE/MA (partial)	267,047	266,817	$537,626	1.1%
WGOM	Yellowtail Flounder	CC/GOM (partial); SNE/MA (partial)	467,772	467,461	$401,180	0.8%
WGOM	Atlantic Halibut	N/A	39,837	34,757	$223,607	0.5%

* Largest sources of non-groundfish revenue are Monkfish, American Lobster, and Skates

Source: CAMS (7/22/2024)

5.7.7 **Fishing Communities**

A large number of communities have been the homeport or landing port to one or more Northeast groundfish fishing vessels since 2019. These ports occur throughout New England and the Mid-Atlantic. Consideration of the economic and social impacts on these communities from proposed fishery regulations is required by the National Environmental Policy Act (NEPA 1970) and the M-S Act. Before any agency of the federal government may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) that "utilizes a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment." National Standard 8 of the MSA stipulates that "conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851(a)(8)).

A "fishing community" is defined in the M-S Act 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)). Determining which fishing communities are "substantially dependent" on and "substantially engaged" in the groundfish fishery can be difficult. Although it is useful to narrow the focus to individual communities in the analysis of fishing dependence, there are a number of potential issues with the confidential nature of the information. There are privacy concerns with presenting the data in such a way that proprietary information (landings, revenue, etc.) can be attributed to an individual vessel or a small group of vessels. This is particularly difficult when presenting information on ports that may only have a small number of active vessels.

Table 32 – Table 36 summarize trends by community, when possible, showing the number of dealers, vessels, trips landing in that community or state, as well as the associated groundfish and non-groundfish volume and revenue. Highly engaged communities, as defined below in Section 5.7.7.1.1, are separated when possible. The ports and states highlighted indicate those that comprise at least 1% of groundfish revenue or total revenue from groundfish trips.

As discussed in Section 5.7.4, Massachusetts has the largest share of groundfish landings and revenue in the region in every year 2019 to 2023 and has several communities that each have high levels of groundfish landings and revenue. New Bedford and Gloucester each have been the highest grossing communities over the years (Table 32). Gloucester had experienced relatively consistent levels of groundfish revenue from 2019 – 2021 before declining in 2022 and again in 2023 to a five-year low of $12.64 million. Gloucester was the highest grossing port during 2019 – 2021 but was surpassed by New Bedford in 2022 – 2023. Due to data confidentiality, the ports of Boston and Scituate were combined. Together, they comprise the third highest grossing port in the region, grossing between $11.30 and $15.43 million dollars annually in groundfish revenue. The vast majority of this revenue is associated with the port of Boston.

Maine has the second largest share of groundfish landings and revenue (Table 33). Portland, the largest groundfish port in Maine, experienced a 5-year high in groundfish revenue in 2022 before decreasing to $2.51 million in 2023.

New Hampshire has the third largest share of groundfish landings and revenue, despite not being home to any ports that are considered "highly engaged" in the fishery (Table 34). In 2023, New Hampshire experienced $0.27 million in groundfish revenue, a five-year low. Participation in the fishery, in terms of the number of vessels taking at least one groundfish trip, has declined to 4 vessels in 2022 and 5 vessels in 2023.

Rhode Island has the fourth largest share of groundfish landings and revenue, though 2023 revenue totaled only $0.03 million (Table 35). Point Judith, the largest groundfish port in Rhode Island, comprised nearly all groundfish revenue in that state during 2023.

Finally, groundfish landings and revenue from groundfish trips in other states have been minimal (Table 36). Combined groundfish revenues from Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina were $0.02 million during 2023.

Table 32 – Massachusetts Communities. Highly engaged communities separated, when data confidentiality allows. Landings and revenue represents total groundfish and non-groundfish revenue landed on groundfish trips, by dealer location (Millions of pounds/millions of $2023).

Dealer Sale Port/State	Metric	2019	2020	2021	2022	2023
BOSTON & SCITUATE	GF Revenue	14.64	15.43	13.83	11.3	12.31
	GF Landings	11.97	11.9	8.65	8.49	10.1
	Dealers	12	14	10	12	7
	Trips	946	859	872	799	815
	Vessels	29	25	23	21	20
	NGF Revenue	3.39	2.67	4.26	3.12	3.27
	NGF Landings	1.7	1.66	2.15	1.74	1.86
CHATHAM & PROVINCETOWN	GF Revenue	0.39	0.17	0.2	0.06	0.12
	GF Landings	0.17	0.07	0.09	0.03	0.07
	Dealers	10	12	10	8	11
	Trips	1456	1663	1049	985	1085
	Vessels	34	32	29	23	33
	NGF Revenue	4.03	4.89	3.39	3.1	4.03
	NGF Landings	6.41	8.62	4.97	5.01	4.37
GLOUCESTER	GF Revenue	22.08	21.09	19.67	14.14	12.64
	GF Landings	19.45	17.57	12.95	10.74	10.4
	Dealers	30	18	21	17	18
	Trips	2056	2105	2011	1581	1467
	Vessels	60	58	53	55	52
	NGF Revenue	4.54	4.08	5.57	3.95	4.14
	NGF Landings	2.53	1.69	1.9	1.71	1.84
NEW BEDFORD	GF Revenue	14.09	22.76	19.11	16.78	13.11
	GF Landings	8.74	19.54	13.74	12.07	10.07
	Dealers	20	16	12	14	13
	Trips	562	740	572	523	464
	Vessels	32	39	29	26	25
	NGF Revenue	4.47	6.04	7.2	7.45	5.9
	NGF Landings	2.85	3.41	3.08	4.24	2.93
MA TOTAL	GF Revenue	51.65	59.72	52.95	42.32	38.27

Dealer Sale Port/State	Metric	2019	2020	2021	2022	2023
	GF Landings	40.52	49.18	35.49	31.34	30.71
	Dealers	54	48	46	44	40
	Trips	5,103	5,358	4,486	3,851	3,787
	Vessels	135	138	119	109	107
	NGF Revenue	17.00	18.22	20.85	17.77	17.56
	NGF Landings	14.14	16.14	12.53	12.86	11.21

Source: CAMS data. Accessed October 2024

Table 33 – Maine Communities. Highly engaged communities separated, when data confidentiality allows. Landings and revenue represents total groundfish and non-groundfish revenue landed on groundfish trips, by dealer location (Millions of pounds/millions of $2023).

Dealer Sale Port/State	Metric	2019	2020	2021	2022	2023
PORTLAND	GF Revenue	2.51	1.81	1.62	2.9	2.51
	GF Landings	1.29	0.99	0.67	1.45	1.37
	Dealers	8	5	10	7	5
	Trips	423	229	276	461	378
	Vessels	25	26	22	24	25
	NGF Revenue	0.79	0.33	0.49	0.95	0.52
	NGF Landings	0.58	0.23	0.22	0.46	0.31
ME TOTAL	GF Revenue	2.97	1.93	1.84	3.15	3.01
	GF Landings	1.51	1.04	0.76	1.56	1.67
	Dealers	13	12	16	13	10
	Trips	542	307	379	546	495
	Vessels	31	29	26	29	32
	NGF Revenue	0.92	0.42	0.84	1.12	0.70
	NGF Landings	0.64	0.27	0.34	0.52	0.38

Source: CAMS data. Accessed October 2024

Table 34 – New Hampshire Communities. Highly engaged communities separated, when data confidentiality allows. Landings and revenue represents total groundfish and non-groundfish revenue landed on groundfish trips, by dealer location (Millions of pounds/millions of $2023).

Dealer Sale Port/State	Metric	2019	2020	2021	2022	2023
NH	GF Revenue	1.01	1.43	1.13	0.55	0.27
	GF Landings	0.46	0.8	0.56	0.32	0.14
	Dealers	11	12	10	4	3
	Trips	602	683	463	181	157
	Vessels	17	15	11	4	5
	NGF Revenue	0.77	0.49	0.44	0.31	0.25
	NGF Landings	1.05	0.86	0.58	0.23	0.19

Source: CAMS data. Accessed October 2024

Table 35 – Rhode Island Communities. Highly engaged communities separated, when data confidentiality allows. Landings and revenue represents total groundfish and non-groundfish revenue landed on groundfish trips, by dealer location (Millions of pounds/millions of $2023).

Dealer Sale Port/State	Metric	2019	2020	2021	2022	2023
POINT JUDITH	GF Revenue	0.4	0.21	0.16	0.08	0.02
	GF Landings	0.11	0.10	0.05	0.03	0.01
	Dealers	14	13	13	14	15
	Trips	661	611	412	371	292
	Vessels	24	23	13	14	11
	NGF Revenue	1.49	1.6	1.1	1.25	0.85
	NGF Landings	3.96	3.7	2.04	2.71	1.75
RI TOTAL	GF Revenue	0.42	0.22	0.17	0.09	0.03
	GF Landings	0.12	0.1	0.05	0.03	0.01
	Dealers	18	17	17	17	22
	Trips	695	657	449	434	359
	Vessels	27	28	17	17	16
	NGF Revenue	1.63	1.81	1.36	1.63	1.3
	NGF Landings	4.27	4.39	2.69	3.88	2.97

Source: CAMS data. Accessed October 2024

Table 36- Connecticut/Maryland/New Jersey/New York/North Carolina/Virginia Communities. Highly engaged communities separated, when data confidentiality allows. Landings and revenue represents total groundfish and non-groundfish revenue landed on groundfish trips, by dealer location (Millions of pounds/millions of $2023).

Dealer Sale Port/State	Metric	2019	2020	2021	2022	2023
CT/MD/NJ/NY/NC/VA	GF Revenue	0.12	0.13	0.05	0.04	0.02
	GF Landings	0.05	0.07	0.02	0.01	0.01
	Dealers	37	32	20	23	18
	Trips	380	531	241	239	195
	Vessels	33	28	23	23	18
	NGF Revenue	1.66	1.96	1.03	1.08	0.71
	NGF Landings	1.14	1.33	0.63	1.26	0.87

Source: CAMS data. Accessed October 2024

5.7.7.1 Community Fishing Engagement and Social Vulnerability Indicators

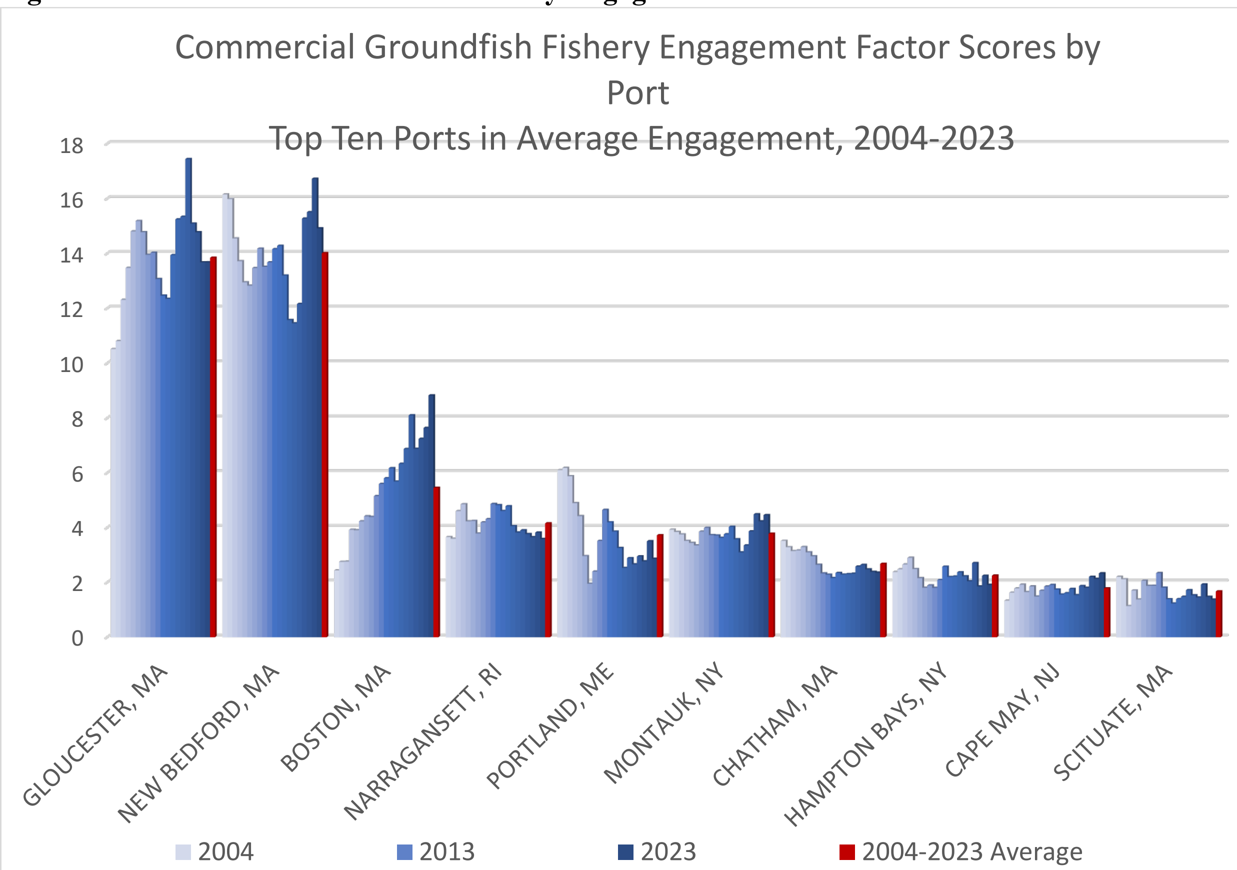
In addition to primary and secondary port classifications for groundfish landings and revenue, fishing communities can also be understood in terms of overall engagement in the commercial groundfish fishery and other social and economic community conditions. NOAA Fisheries social scientists produce indicators of commercial fishing engagement, reliance, and other community characteristics for virtually all fishing communities throughout United States, referred to as the Social Indicators of Fishing Community Vulnerability and Resilience (Colburn and Jepson 2012). The Social Indicators are composite indices of factors that comprise community-level latent constructs, such as commercial fishing engagement or social vulnerability. The strength of these indicators is that they provide greater depth and contextualization to our understanding of fishing communities than the more commonly utilized landings and revenue statistics. The Social Indicators provide a more comprehensive view of fishing communities by including social and economic conditions that can influence the viability of commercial fishing activities, such as gentrification pressure, poverty, and housing characteristics, among other factors.

5.7.7.1.1 2004 – 2023 Groundfish-Specific Commercial Engagement

The Groundfish-Specific Engagement Indicator is a numerical index that reflects the level of a community's engagement in the groundfish fishery relative to other communities in the Northeast. This index was generated using a principal components factor analysis (PCFA) of variables related to groundfish fishing activity from NOAA Fisheries regional datasets. PCFA is a common statistical technique used to identify factors that are related, yet linearly independent, and likely represent a latent or unobservable concept when considered together, such as factors that contribute to the level of a community's social vulnerability or engagement in commercial fishing. The variables that were identified to best reflect community engagement in the groundfish fishery were the value of groundfish landings (in dollars), the groundfish pounds landed, the number of federally permitted dealers that purchased at least one pound of groundfish, and the number of vessels with at least one category of large mesh groundfish permit (multiple permits on one vessel in a given year are not double counted). It should be noted that a high engagement score does not necessarily mean that a community or its fishery participants are solely dependent upon commercial groundfish fishing activities. There may be other commercial fishing or economic activities that may sustain the livelihoods of individuals or entities within these communities that have relied on groundfish historically.

Figure 10 displays the factor scores for the Groundfish-Specific Commercial Engagement Indicator for the ten communities that have the highest average commercial engagement with groundfish between 2004 and 2023, noting that there have been large changes in the latter half of this time period for many of the communities. The index factor scores are commonly categorized from low to high based on the number of standard deviations from the mean, which is set at zero. Categories rank from 0.00 or below as "low", 0.00 – 0.49 as "medium," and 0.50 – 0.99 as "medium-high," and 1 standard deviation or above as "high." All of the ports displayed in Figure 9 have "high" commercial groundfish engagement, but New Bedford and Gloucester have had dramatically higher levels of engagement in commercial groundfish than other highly engaged ports over the period. These two communities had more than twice the level of engagement in commercial groundfish than the third most highly engaged community, Boston, MA. The remaining seven highly engaged communities included, in order of their levels of engagement: Narragansett/Point Judith, RI; Portland, ME; Montauk, NY; Chatham, MA; Hampton Bays/Shinnecock, NY; Cape May, NJ; and Scituate, MA.

Figure 10 – Commercial Groundfish Fishery Engagement Scores



5.7.7.1.2 **2009 – 2020 Recreational Engagement**

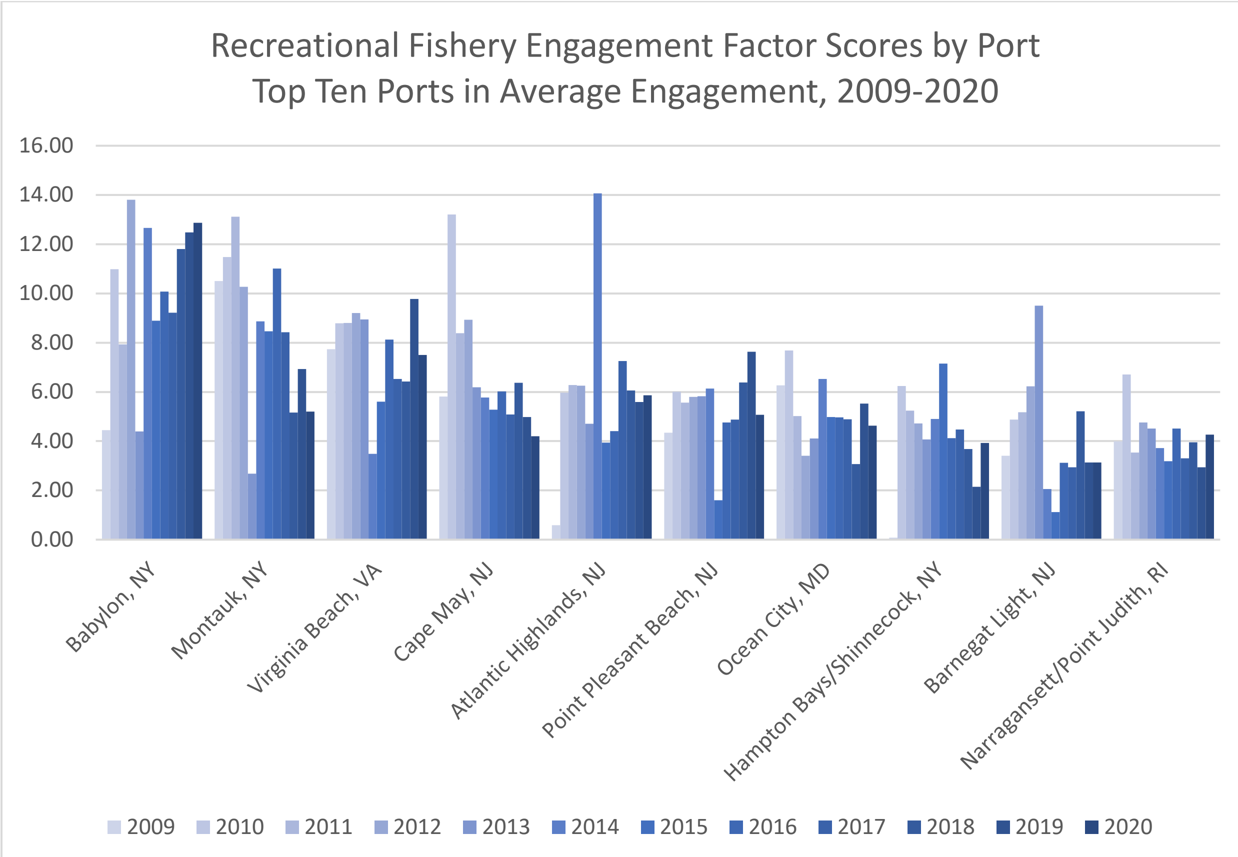
The Recreational Engagement Indicator is a numerical index that reflects the level of a community's engagement in all recreational fisheries relative to other communities in the Northeast. Index factor scores are available from 2009 – 2020 and will be updated through 2021 in the next groundfish specifications framework adjustment. Unlike the commercial engagement indicator, there is no groundfish-specific recreational engagement indicator. Similar to the commercial engagement indicator, the recreational indicator was calculated using PCFA. The recreational indicator, however, uses variables relating to recreational fishing activity for all recreational fisheries in the Northeast region from the NOAA Marine

Recreational Information Program (MRIP) site survey for recreational fishing, and therefore are not specific to the groundfish fishery. Estimates of fishing pressure by mode were used in order to derive a recreational engagement index. Fishing mode refers to the type of recreational activity, such as charter/party boats or shore fishing. MRIP survey sites are associated with the community they fall within and site estimates for all modes were summed for each community in order to derive a community-level estimate of recreational fishing engagement.

Figure 11 displays recreational engagement factor scores by year for the ten communities that have the highest average engagement across all recreational fisheries for the period of 2009 to 2020. The index factor scores are commonly categorized from low to high based on the number of standard deviations from the mean, which is set at zero. Categories rank from 0.00 or below as "low", 0.00 – 0.49 as "medium," and 0.50 – 0.99 as "medium-high," and 1 standard deviation or above as "high." While all of the communities in Figure 11 have had high average engagement in recreational fisheries over the twelve year period, there has been considerable annual variability in the index scores. For example, Atlantic Highlands, NJ, boasted the highest individual year score among these communities in 2013, but for all other years in the time series this community has had more modest recreational engagement relative to other communities and falls in the middle of the pack overall in terms of the ten-year average. The other communities among the top ten in average engagement include Babylon, NY; Montauk, NY; Virginia Beach, VA; Cape May, NJ; Point Pleasant Beach, NJ; Ocean City, MD; Hampton Bays/Shinnecock, NY; Barnegat Light, NJ; and Narragansett/Point Judith, RI. Most of the top communities in recreational engagement in the Northeast are in the Mid-Atlantic region, except for Narragansett/Point Judith, RI. Recreational fishermen in these communities are unlikely to rely on Northeast Multispecies, though some fishermen in these ports may seasonally target GB cod.

When expanding out to the top 20 communities in recreational engagement in the Northeast, several additional New England communities are included: Newburyport, MA and Barnstable, MA, which have each seen increased recreational engagement in recent years (not shown in Figure 11). Other ports of interest with relatively high engagement (i.e., ranking somewhere outside the top 20) in the last five years include Gloucester, MA; Waterford, CT; East Lyme/Niantic, CT; and Old Saybrook, CT.

Figure 11 – Recreational Fishery Engagement Scores



5.7.7.1.3 **2016 – 2020 Community Social Vulnerability and Gentrification Pressure Indicators**

The Community Social Vulnerability Indicators include indices of labor force structure, housing characteristics, poverty, population composition, and personal disruption. The labor force structure index measures the makeup of the labor force and is reversed scored so that a higher factor score represents fewer employment opportunities and greater labor force vulnerability. The housing characteristics index measures vulnerability related to infrastructure and home and rental values. It is also reversed score so that a higher score represents more vulnerable housing infrastructure. The poverty index captures multiple different factors that contribute to an overall level of poverty in a given area. A higher poverty index score would indicate a greater level of vulnerability due to a higher proportion of residents receiving public assistance and below federal poverty limits. The population composition index measures the presence of vulnerable populations (i.e., children, racial/ethnic minorities, and/or single-parent, female-headed households) and a higher score would indicate that a community's population is composed of more vulnerable individuals. Finally, the personal disruption index considers variables that affect individual-level vulnerability primarily and include factors such as low individual-level educational attainment or unemployment. Higher scores of personal disruption likely indicate greater levels of individual vulnerability within a community, which can in turn impact the overall level of community social vulnerability.

Gentrification Pressure Indicators include housing disruption, urban sprawl, and retiree migration. The Housing Disruption Index combines factors that correspond to unstable or shifting housing markets in which home values and rental prices may cause residents to become displaced. The Urban Sprawl Index indicates the extent of population increase due to migration from urban centers to suburban and rural areas, which often results in cost of living increases and gentrification in the destination communities.

The Retiree Migration Index characterizes communities by the concentration of retirees or individuals above retirement age whose presence often raises the home values and rental rates, as well as increases the need for health care and other services.

Data used to develop these indices come from multiple secondary data sources, but primarily the U.S. Census American Community Survey (ACS) at the place level (Census Designated Place (CDP) and Minor Civil Division (MCD)). More information about the data sources, methods, and other background details can be found online at https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/.

Groundfish fishery primary ports that ranked medium-high to high for at least one of these indices are: New Bedford, MA, Boston, MA, Montauk, NY, Chatham, MA, and Cape May, NJ (Table 37 and Table 38). These communities may be more vulnerable to changes in federal actions. Though the proposed actions should not have disproportionately high effects on low income or minority populations, there is insufficient demographic data on participants in the groundfish fishery (i.e., vessel owners, crew, dealers, processors, employees of supporting industries) to quantify the income and minority status of fishery participants at these ports. However, it is qualitatively known that people of racial or ethnic minorities constitute a substantial portion of the employees in the seafood processing sector, particularly in communities such as New Bedford.

Table 37 – Community Social Vulnerability Indicator Categorical Scores

Community	Total Population (2020)	Poverty	Labor Force	Housing Characteristics	Population Composition	Personal Disruption
New Bedford, MA	100,970	Med-High	Low	Med-High	Med-High	Med-High
Gloucester, MA	29,750	Low	Low	Low	Low	Low
Boston, MA	674,272	Med-High	Low	Low	High	Medium
Narragansett, RI	14,532	Low	Medium	Low	Low	Low
Portland, ME	68,427	Medium	Low	Medium	Low	Low
Montauk, NY	3,563	Low	Med-High	Low	Low	Low
Chatham, MA	6,597	Low	High	Low	Low	Low
Hampton Bays, NY	14,684	Low	Low	Low	Medium	Low
Scituate, MA	19,063	Low	Low	Low	Low	Low
Cape May, NJ	2,823	Low	Med-High	Medium	Low	Low

Table 38 – Community Gentrification Pressure Indicator Categorical Scores

Community	Housing Disruption	Retiree Migration	Urban Sprawl
New Bedford, MA	Low	Low	Med-High
Gloucester, MA	Medium	Low	Medium
Boston, MA	High	Low	High
Narragansett, RI	Med-High	Medium	Low
Portland, ME	Medium	Low	Medium
Montauk, NY	High	Med-High	Med-High
Chatham, MA	High	High	Medium
Hampton Bays, NY	High	Low	Medium
Scituate, MA	Med-High	Low	Med-High
Cape May, NJ	High	Med-High	Low

5.7.7.2 Employment

Throughout the Northeast, many communities benefit indirectly from the multispecies fishery, but these benefits are often difficult to attribute. The direct benefit from employment in the fishery can be estimated by the number of crew positions. However, crew positions do not equate to the number of jobs in the fishery and do not make the distinction between full and part-time positions. Crew positions here are measured as the average number of crew taken by each limited access permitted groundfish vessel on declared groundfish trips by fishing year, multiplied by the number of active groundfish vessels. During the 2023 fishing year, vessels with limited access groundfish permits, on declared groundfish trips, provided 525 crew positions, with 66% of these positions coming from trips landing in Massachusetts (Table 39). Over the 2019 – 2023 period, the total number of crew positions in the groundfish fishery has reduced by 23%.

A crew day[26] is a measure of employment that incorporates information about the time spent at sea earning a share of the revenue. Conversely, crew days can be viewed as an indicator of time invested in the pursuit of "crew share" (the share of trip revenues received at the end of a trip). The time spent at sea has an opportunity cost. For example, if crew earnings remain constant, a decline in crew days would reveal a benefit to crew in that less time was forgone for the same amount of earnings. During the 2023 fishing year, vessels with limited access groundfish permits, on declared groundfish trips, used 36,164 crew days, with 89% coming from trips landing in Massachusetts (Table 39). Over the 2019 – 2023 period, the total number of crew days in the groundfish fishery has reduced by 9%. The number of crew positions and crew days give some indication of the direct benefit to communities from the multispecies fishery through employment. But these measures, by themselves, do not show the benefit or lack thereof at the individual level. Many groundfish captains and crew are second- or third-generation fishermen who hope to pass the tradition on to their children. This occupational transfer is an important component of community continuity as fishing represents a valued occupation in many of the smaller port areas.

Table 39 – Number of crew positions and crew days on active groundfish vessels by state of landing (dealer state) and fishing year.

		2019	2020	2021	2022	2023
MA	positions	411	446	366	347	349
	days	34,168	39,064	33,431	29,883	32,232
ME	positions	88	81	67	79	82
	days	2,806	2,029	1,392	2,481	2,348
NH	positions	40	29	22	9	12
	days	1,010	1,007	712	385	433
RI	positions	64	70	41	41	36
	days	968	1,149	765	827	792
Other	positions	78	71	51	48	45
	days	910	1,142	353	423	359
Total	**Total crew positions**	682	697	547	523	525
	Total crew days	39,863	44,391	36,653	33,999	36,164

Source: CAMS data. Accessed October 2024

[26] Similar to a "man-hour," a "crew day" is calculated by multiplying a vessel's crew size by the days absent from port. Since the number of trips affects the crew-days indicator, the indicator is also a measure of work opportunity.

5.7.7.2.1 **Commercial Crew Characteristics**

The Socio-Economic Survey of Hired Captains and Crew in New England and Mid-Atlantic Commercial Fisheries (hereafter referred to as the Crew Survey) is an ongoing effort conducted by the Social Sciences Branch (SSB) of the National Oceanic and Atmospheric Administration (NOAA) Fisheries Northeast Fisheries Science Center (NEFSC). The Crew Survey gathers general information about the characteristics and experiences of commercial fishing crew (including hired captains) because little is known about this critical segment of the commercial fishing industry. Information collected by the survey include demographics, remuneration, well-being, fishing practices, job satisfaction, job opportunities, and attitudes towards fisheries management, among other subjects (Henry and Olson 2014; Silva et al. 2021; Cutler et al. 2022). There have been three waves of Crew Survey data collection thus far – Wave 1 in 2012 – 2013, Wave 2 in 2018 – 2019, and Wave 3 in 2023 – 2024.

In the following sections, Crew Survey data are presented based on the full samples from all three survey waves. The full samples include crew and hired captains across all commercial fisheries in the Northeast. While these samples are not designed to be representative of any specific fishery, these data constitute the best scientific information available regarding the socioeconomic characteristics and well-being of crews and hired captains in the region overall. Socioeconomic and demographic trends among commercial crews in general can, and often do, reflect the conditions of crews involved in the commercial groundfish fishery, specifically. More information about the Crew Survey, including the background and methodology for its implementation, can be found at https://www.fisheries.noaa.gov/new-england-mid-atlantic/socioeconomics/2023-commercial-fishing-crew-survey.

5.7.7.2.1.1 **Crew Demographics**

In this section, descriptive statistics for demographic variables from the Crew Survey are reported. Demographic variables reported in this section include respondents' primary fishery, age, race and ethnicity, annual income from fishing, and educational attainment. Descriptive statistics for these data are also provided in Table 40 – Table 42.

According to Crew Survey data, the total number of crew respondents primarily targeting groundfish dropped 13% between 2012-13 and 2018 – 2019 but increased a few percentage points from 2018 – 2019 to 2023 – 2024. In 2012 – 2013, about 20% of respondents reported that they primarily targeted groundfish, whereas only 7% of respondents primarily targeted groundfish in 2018 – 2019. In 2023 – 2024, about 11% of commercial crew respondents to the survey reported that they primarily targeted groundfish species. This fluctuation in groundfish targeting is likely the result of a multitude of confounding factors, including changes in management, market, and ecosystem conditions. While these data do not track whether specific crew members who previously targeted groundfish shifted to targeting another fishery or left the commercial fishing industry altogether, the other two most common primary fisheries targeted among crew have been scallop (28% in 2012 – 2013, 32% in 2018 – 2019, and 22% in 2023 – 2024) and lobster (20% in 2012 – 2013, 18% in 2018 – 2019, and 21% in 2023 – 2024). Interestingly, the percentage who reported targeting multiple fisheries for their primary source of income increased substantially over the three survey waves. No respondents reported targeting multiple primary fisheries in 2012 – 2013, but about 5% of respondents reported multiple primaries in 2018 – 2019 and this percentage increased sharply to 20% in the most recent 2023 – 2024 wave.

The mean age for all respondents increased from 38 in 2012 – 2013 to 40 in 2018 – 2019 and remained static at 40 in 2023 – 2024. This shift has been due in part to the increase among those aged 55 or older in addition to a relative decrease among those under 35 (Table 40). These data suggest that crew are undergoing a "graying of the fleet" phenomenon, as noted in prior studies of commercial fisheries in this region and elsewhere (Donkersloot and Carothers 2016; Cramer et al. 2018; Johnson and Mazur 2018).

The large majority of crew across all fisheries in all three waves identified as non-Hispanic, white. Educational attainment among crew remained virtually unchanged between 2012 – 2013 and 2018 – 2019, with the large majority in both samples having attained a high school education or less (76% in 2012 – 2013 and 77% in 2018 – 2019). However, there was a fairly dramatic shift in 2023 – 2024, with the percentage having attained high school or less education dropping from about three-quarters to roughly two-thirds between 2018 – 2019 and 2023 – 2024, and an increase from only one-in-ten respondents in 2018 – 2019 to more than one-in-five in 2023 – 2024 with an associate's or equivalent degree.

Self-reported annual fishing incomes increased from 2012 – 2013 to 2018 – 2019 but remained relatively stable from 2018 – 2019 to 2023 – 2024.

Table 40 – Crew Survey Demographics

Survey Wave	2012-13	2018-19	2023-2024
	N (%)	N (%)	N (%)
Total	359 (100%)	478 (100%)	162 (100%)
18 – 24	63 (18%)	53 (11%)	22 (14%)
25 – 34	93 (26%)	151 (32%)	36 (23%)
35 – 44	94 (26%)	99 (21%)	44 (28%)
45 – 54	70 (20%)	104 (22%)	28 (18%)
55 or above	39 (11%)	71 (15%)	28 (18%)
Hispanic	34 (9%)	32 (7%)	18 (11%)
Non-Hispanic	325 (91%)	446 (93%)	144 (89%)
White	306 (85%)	423 (88%)	147 (91%)
Black/African-American	10 (3%)	6 (1%)	0 (0%)
American Indian or Alaskan Native	8 (2%)	1 (<1%)	0 (0%)
Asian	0 (0%)	5 (1%)	0 (0%)
Native Hawaiian or Pacific Islander	0 (0%)	1 (<1%)	0 (0%)
Some Other Race	18 (5%)	21 (4%)	9 (6%)
Person of Two or More Races	11 (3%)	9 (2%)	6 (4%)
Don't Know/No Answer	6 (2%)	12 (3%)	0 (0%)
Less than $30,000	81 (23%)	43 (9%)	18 (11%)
$30,000 - $59,999	122 (34%)	93 (19%)	25 (15%)
$60,000 - $89,999	61 (17%)	93 (19%)	43 (27%)
$90,000 - $119,999	31 (9%)	73 (15%)	28 (17%)
$120,000 or more	25 (7%)	130 (27%)	38 (23%)
No Answer	39 (11%)	46 (10%)	10 (6%)
Some High School	60 (17%)	65 (14%)	15 (9%)
High School or GED	211 (59%)	300 (63%)	91 (56%)
Associate's/Two-year Degree	48 (13%)	54 (11%)	36 (22%)
Bachelor's/Four-year Degree	30 (8%)	51 (11%)	16 (10%)
Graduate Degree	3 (1%)	3 (1%)	0 (0%)
Don't Know/No Answer	7 (2%)	--	4 (2%)

5.7.7.2.1.2 Crew Participation in the Commercial Fishing Industry

In this section, descriptive statistics are provided from all three waves of the Crew Survey regarding crew respondents' histories of involvement in commercial fishing, including their familial and intergenerational histories in the industry. Survey questions reported in this section include respondents' family involvement and number of family generations in commercial fishing, number of years in the industry and on their current vessels, and their paths to employment in the industry.

Most crew reported having family in the commercial fishing industry in some capacity, either on vessels or employed in shoreside industries. In 2023 – 2024, 70% of crew interviewed reported having a family member involved in the industry in some capacity. Similarly, the majority of crew respondents reported having multiple family generations involved in commercial fishing. Nearly two-thirds of crew interviewed in 2023 – 2024 were from a multigenerational fishing family. The average number of years of experience in commercial fishing among crew increased over time, with fewer new entrants (<5 years in the industry). Only slightly more than one third of crew interviewed in 2023 – 2024 had less than five years of experience on their current vessels, with the large majority having five or more years and more half of crew having more than 15 years on their current vessels.

Table 41- Crew Participation in the Commercial Fishing Industry

Survey Wave		2012-13	2018-19	2023-2024
		N (%)	N (%)	N (%)
Total		359 (100%)	478 (100%)	162 (100%)
Family involved in commercial fishing	Yes	194 (54%)	286 (60%)	113 (70%)
	No	165 (46%)	192 (40%)	48 (30%)
Number of generations in commercial fishing	First generation	162 (45%)	194 (41%)	58 (36%)
	Second generation	69 (19%)	87 (18%)	39 (24%)
	Third generation	62 (17%)	98 (21%)	34 (21%)
	Fourth gen. or greater	63 (18%)3	99 (21%)	30 (19%)
	Don't know/No answer	(1%)	0 (0%)	1 (1%)
Number of years in commercial fishing	Less than 5 years	66 (18%)	77 (16%)	21 (13%)
	5 to 15 years	100 (28%)	168 (35%)	56 (35%)
	16 to 29 years	109 (30%)	110 (23%)	47 (29%)
	30 years or more	81 (23%)	123 (26%)	38 (23%)
	Don't know/No answer	3 (1%)	0 (0%)	0 (0%)
Number of years on current vessel	Less than 5 years	209 (58%)	289 (60%)	60 (37%)
	5 to 15 years	114 (32%)	148 (31%)	66 (41%)
	16 to 29 years	26 (7%)	36 (8%)	26 (16%)
	30 years or more	10 (3%)	5 (1%)	10 (6%)
Path to employment on current vessel	Word of mouth	74 (21%)	204 (43%)	34 (21%)
	Referred by friend	78 (22%)	123 (26%)	54 (33%)
	Related to owner	36 (10%)	56 (12%)	35 (22%)
	Related to crew	9 (3%)	21 (4%)	14 (9%)
	Previous work	139 (39%)	23 (5%)	18 (11%)
	Advertisement	1 (<1%)	2 (<1%)	2 (1%)
	Other	22 (6%)	49 (10%)	5 (3%)

5.7.7.2.1.3 Crew Participation in and Attitudes about Fisheries Management

In this section, descriptive statistics are provided from all three waves of the Crew Survey regarding crew respondents' participation in and attitudes about fisheries management. Survey questions reported in this section include respondents' past participation in any aspect of fisheries management (e.g. attending council meetings, writing letters, delivering public comment), as well as their attitudes about multiple dimensions of fisheries management, such as the pace of rules changing, fairness of fines associated with breaking rules, and the restrictiveness of rules governing their primary fisheries.

The majority of crew have not participated in any aspect of fisheries management, including attending meetings, writing letters/email, or providing public comment. However, crew respondents consistently expressed an overall negative view across all three survey waves about the impact of fisheries rules and regulations on their primary fisheries. Most crew (greater than 60% in each survey wave) either agreed or strongly agreed that rules and regulations change so quickly that it is hard to keep up. More than half in each survey wave reported that they either agreed or strongly agreed that the regulations in their primary fisheries are too restrictive, while less than half agreed or strongly agreed that the fines associated with breaking the rules were fair.

Table 42 – Crew Participation in and Attitudes about Fisheries Management

Survey Wave		2012-13	2018-19	2023-2024
		N (%)	N (%)	N (%)
Total		200 (100%)	478 (100%)	162 (100%)
Participated in Fisheries Management	Yes No	65 (33%) 135 (68%)	190 (40%) 288 (60%)	56 (35%) 103 (64%)
Total		159 (100%)	478 (100%)	162(100%)
"The rules and regulations change so quickly it is hard to keep up."	Strongly Agree Agree Neutral Disagree Strongly Disagree Don't Know/No Answer	41 (26%) 62 (39%) 12 (8%) 36 (23%) 2 (1%) 6 (4%)	98 (21%) 199 (42%) 96 (20%) 79 (17%) 5 (1%) 1 (<1%)	83 (51%) 44 (27%) 22 (14%) 7 (4%) 3 (2%) 3 (2%)
"The fines that are associated with breaking the rules and regulations of my primary fishery are fair."	Strongly Agree Agree Neutral Disagree Strongly Disagree Don't Know/No Answer	2 (1%) 35 (22%) 17 (11%) 34 (21%) 37 (23%) 34 (21%)	23 (5%) 199 (42%) 144 (30%) 62 (13%) 49 (10%) 1 (<1%)	9 (6%) 35 (22%) 61 (38%) 25 (15%) 28 (17%) 4 (2%)
"I feel that the regulations in my primary fishery are too restrictive."	Strongly Agree Agree Neutral Disagree Strongly Disagree Don't Know/No Answer	48 (30%) 56 (35%) 16 (10%) 33 (21%) 2 (1%) 4 (3%)	107 (22%) 140 (29%) 116 (24%) 104 (22%) 10 (2%) 1 (<1%)	75 (46%) 39 (24%) 22 (14%) 20 (12%) 3 (2%) 3 (2%)

5.7.8 **Consolidation and Redirection**

The multiple regulatory constraints placed on common pool groundfish fishermen are intended to control their effort and catch per unit effort (CPUE) as a means to limit mortality. Exemptions from many of these controls, which have been granted to sectors, may increase the CPUE of sector participants. As a result, sector fishermen may have additional time that they could direct towards non-groundfish stocks, resulting in redirection of effort into other fisheries. Additionally, to maximize efficiency, fishermen within a single sector may be more likely to allocate fishing efforts such that some vessels do not fish at all. This is referred to as fleet consolidation.

Both redirection and consolidation have been observed when fishery management regimes outside the Northeast US shifted toward a catch share management regime such as sectors. For example, research following the rationalization of the halibut and sablefish fisheries by the North Pacific Fishery Management Council found individuals who received enough quota shares were able to continue fishing with less competition, greater economic certainty, and over a longer fishing season (Matulich & Clark 2001). However, individuals who did not receive enough of a catch share either bought or leased catch shares from other fishermen or sold their quota. Similarly, one year after implementation of the Bering Sea-Aleutian Island crab fishery Individual Transferable Quota (ITQ), a study found that about half of the vessels that fished the 2004/2005 Bering Sea Snow Crab fishery did not fish the following year. However, research on the ITQ plan for the British Columbia halibut fishery found efficiency gains were greatest during the first round of consolidation, and little incentive to increase efficiency (or continue consolidation) existed afterward (Pinkerton & Edwards 2009).

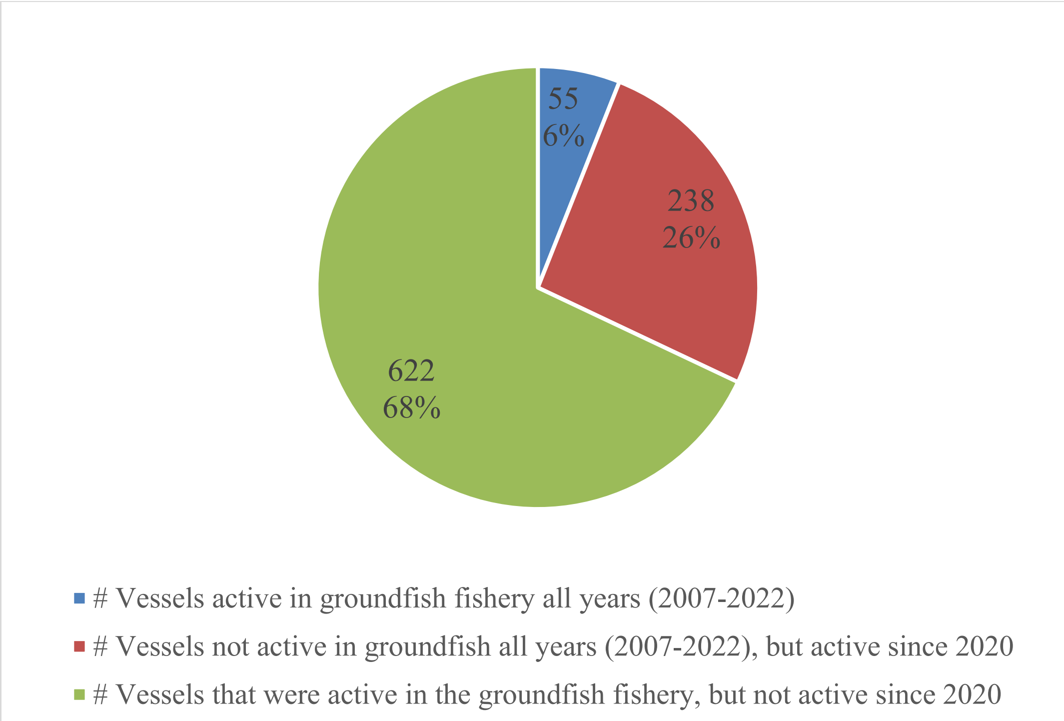
Table 43 shows the change in participation in the groundfish fishery over time. All years in the time series show a decline in the number of active vessels, relative to the previous year. Entry is defined as a vessel being active in a given year, after being inactive in the previous year. Similarly, exit is defined as a vessel being inactive in a given year, after being active in the previous year. Figure 12 provides a breakdown of vessel-level activity over the course of the full time series. A total of 55 vessels were active in the groundfish fishery every year, while 238 vessels have been intermittently active, but have been active in at least one recent fishing year (2020 – 2022). A total of 622 vessels were active at some point in the time series but have not been active in recent fishing years (2020 – 2022). Among those 622 vessels that have not been active in the groundfish fishery in recent years, 358 vessels continued to fish commercially for other (non-groundfish) species in subsequent years. Table 44 shows the highest revenue-generating fisheries for these 358 vessels after they stopped participating in the groundfish fishery. The participation in other fisheries outside of groundfish varies greatly among these vessels.

Table 43 – Change in participation in the groundfish fishery, fishing years 2007 – 2022. Participation is defined as taking at least one declared groundfish trip in which >0 lbs. of groundfish were landed.

	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
# Active	610	566	521	392	374	361	310	278	270	261	243	223	201	199	177	161
Entry		60	60	38	60	55	32	34	47	46	37	38	28	33	29	26
Exit		104	105	167	78	68	83	66	55	55	55	58	50	35	51	42
Change		-44	-45	-129	-18	-13	-51	-32	-8	-9	-18	-20	-22	-2	-22	-16

Source: GARFO DMIS tables. Accessed October 2023.

Figure 12 – Activity of vessels that have been active in the groundfish fishery, for at least one fishing year, 2007 – 2022.



Source: GARFO DMIS tables. Accessed October 2023.

Table 44 – Distribution of fishery revenue for vessels that had been active in the groundfish fishery, but have not been active since at least 2020 (622 vessels total; 358 with commercial fishing revenue). Revenue includes all years following the most recent year in which the vessel was active in the groundfish fishery.

Fishery	% Revenue
Sea Scallop	34.1%
Squid/Mackerel/Butterfish	23.6%
Summer Flounder/Scup/Black Sea Bass	15.4%
American Lobster	10.7%
Whiting	3.5%
Shrimp	3.5%
Monkfish	1.6%
Other	7.6%

Source: GARFO DMIS tables. Accessed October 2023

5.7.9 Regulated Groundfish Stock Catch

The Northeast Multispecies FMP specifies Annual Catch Limits (ACLs) for 20 stocks[27]. Exceeding an ACL for a stock results in the implementation of Accountability Measures (AMs) to prevent overfishing. The ACL is sub-divided into different components. Those components that are subject to AMs are referred to as sub-ACLs. There are also components of the fishery that are not subject to AMs. These include state waters catches that are outside of federal jurisdiction, and a category referred to as "other sub-components" that combines small catches from various fisheries. Table 45 – Table 47 in this section summarize the most recent completed fishing year (2023) catches.

[27] Currently 20 stocks. Amendment 25 proposes to incorporate four revised Atlantic cod stocks, which would bring the total stocks in the FMP to 22.

Table 45 – FY2023 Northeast Multispecies Percent of Annual Catch Limit Caught (%)

Stock	Components with ACLs and sub-ACLs: With Accountability Measures (AMs)								Sub-components: No AMs	
	Total	Groundfish Fishery	Sector	Common Pool	Recreational	Midwater Trawl Herring Fishery	Scallop Fishery	Small Mesh Fisheries	State Water	Other
	A to H	A+B+C	A	B	C	D	E	F	G	H
GB Cod	120.8	80.2	80.9	54.8					201.0	264.0
GOM Cod	84.1	88.9	88.4	103.2	88.7				40.7	33.4
GB Haddock	24.6	24.9	25.3	4.9		10.0			NA	NA
GOM Haddock	73.5	76.2	86.1	8.3	59.8	1.5			2.9	2.4
GB Yellowtail Flounder	19.4	0.4	0.4	0.0			118.4	-	NA	NA
SNE Yellowtail Flounder	5.8	0.2	0.2	0.2			78.6		21.2	0.2
CC/GOM Yellowtail Flounder	33.5	30.9	32.2	9.5					25.3	96.4
Plaice	26.2	25.9	26.5	5.0					16.2	93.2
Witch Flounder	98.2	97.3	99.1	48.8					12.5	181.0
GB Winter Flounder	16.9	13.7	14.0	2.9					NA	330.2
GOM Winter Flounder	28.4	17.4	20.3	0.7					72.8	22.7
SNE/MA Winter Flounder	17.1	3.8	3.5	5.4					134.3	42.6
Redfish	41.6	41.5	41.9	4.1					NA	NA
White Hake	95.8	96.4	96.6	77.9					NA	29.2
Pollock	32.5	26.8	26.9	18.6					79.9	112.4
Northern Windowpane	63.0	9.0	NA	NA			261.8		138.8	16.5
Southern Windowpane	73.4	27.7	NA	NA			4.4		102.8	130.5
Ocean Pout	50.2	68.9	NA	NA					220.6	21.1
Halibut	64.8	57.1	NA	NA					81.4	229.4
Wolffish	1.8	1.8	NA	NA					NA	NA

Source: NMFS Greater Atlantic Regional Fisheries Office, September 24, 2024, run dates of July 3, 2024 and August 31, 2024

Table 46 – FY2023 Northeast Multispecies Total Catch (mt)

Stock	**Total Catch**	Groundfish Fishery	Sector	Common Pool	Recreational	Midwater Trawl Herring Fishery	Scallop Fishery[1]	Small Mesh Fisheries	State Water	Other
	A to H	A+B+C	A	B	C	D	E	F	G	H
GB Cod	603.4	300.6	294.8	5.9					83.4	219.4
GOM Cod	438.7	417.9	236.6	10.9	170.4				19.6	1.1
GB Haddock	2,783.3	2,756.7	2,744.4	12.3		22.2			0.0	4.4
GOM Haddock	1,801.9	1,799.7	1,322.7	2.7	474.3	0.4			1.7	0.2
GB Yellowtail Flounder	19.9	0.3	0.3	0.0			19.5	-	-	0.0
SNE/MA Yellowtail Flounder	2.2	0.1	0.0	0.0			2.1		0.0	0.0
CC/GOM Yellowtail Flounder	356.1	304.6	299.4	5.2					8.5	43.0
Plaice	1,421.8	1,390.6	1,383.1	7.5					4.6	26.6
Witch Flounder	1,173.9	1,114.7	1,094.6	20.1					2.3	56.8
GB Winter Flounder	279.2	223.1	221.7	1.4					-	56.1
GOM Winter Flounder	219.6	105.7	105.1	0.6					111.2	2.7
SNE/MA Winter Flounder	103.2	16.6	13.7	2.9					25.2	61.4
Redfish	3,942.0	3,925.3	3,921.2	4.1					7.9	8.8
White Hake	1,765.9	1,760.3	1,746.5	13.8					0.3	5.4
Pollock	4,650.0	3,519.4	3,496.6	22.8					540.0	590.6
Northern Windowpane	94.3	9.4	9.3	0.1			81.7		1.1	2.1
Southern Windowpane	272.2	12.4	11.0	1.3			5.6		13.8	240.5
Ocean Pout	41.9	33.7	33.5	0.3					1.0	7.2
Halibut	53.6	36.6	32.1	4.5					14.0	3.0
Wolffish	1.6	1.5	1.5	0.0					-	0.0

[1] Based on scallop fishing year April 2023 through March 2024
Values in metric tons of live weight
Sector and common pool include estimate of missing dealer reports
Source: NMFS Greater Atlantic Regional Fisheries Office, September 24, 2024, run dates of July 3, 2024 and August 31, 2024
Any value for a non-allocated species may include landings of that stock or misreporting of species and/or stock area. These are northern windowpane, southern windowpane, ocean pout, halibut, and wolffish.

Table 47 – FY2023 Northeast Multispecies Other Sub-Component Catch Detail (mt)

Stock	Total	SCALLOP[1]	FLUKE	HAGFISH	HERRING	LOBSTER/ CRAB[2]	MACKEREL	MENHADEN	MONKFISH	REDCRAB	RESEARCH[3]
GB Cod	219.4	6.1	0.1	-	0.2	0.3	-	0.0	0.0	-	0.1
GOM Cod	1.1	0.2	-	-	0.0	-	-	-	0.1	-	0.2
GB Haddock	4.4	3.2	-	-	0.1*	-	-	0.0	-	-	0.2
GOM Haddock	0.2	0.0	-	-	0.0*	-	-	0.0	-	-	0.2
GB Yellowtail Flounder	0.0	-*	-	-	-	-	-	-	-	-	-
SNE Yellowtail Flounder	0.0	-*	-	-	0.0	-	-	0.0	-	-	-
CC/GOM Yellowtail Flounder	43.0	27.8	0.0	-	4.4	-	-	0.0	-	-	-
American Plaice	26.6	24.7	0.1	-	0.2	-	-	0.0	0.0	-	-
Witch Flounder	56.8	28.6	5.5	-	1.2	-	-	0.0	0.0	0.0	-
GB Winter Flounder	56.1	55.9	0.0	-	0.0	-	-	-	-	-	-
GOM Winter Flounder	2.7	2.4	-	-	0.0	0.0	-	0.0	-	-	-
SNE Winter Flounder	61.4	17.4	8.1	-	1.5	0.0	-	0.0	0.1	-	0.0
Redfish	8.8	0.3	-	-	0.2	-	-	0.0	-	-	0.0
White Hake	5.4	0.9	0.1	-	0.1	0.0	-	0.0	2.0	0.0	1.4
Pollock	590.6	0.1	0.0	-	0.0	-	-	0.0	0.2	-	0.1
Northern Windowpane	2.1	-*	0.0	-	0.3	-	-	0.0	-	-	-
Southern Windowpane	240.5	-*	61.6	-	2.7	-	-	0.0	0.1	-	-
Ocean Pout	7.2	3.3	0.5	-	0.1	-	-	0.0	0.0	-	-
Halibut	3.0	0.6	-	-	0.0	0.5	-	0.0	1.5	-	0.0
Wolffish	0.0	0.0	-	-	-	-	-	-	-	-	-

[1] Based on scallop fishing year April 2023 through March 2024

[2] Landings only. Discard estimates not applicable. Lobster/crab discards were not attributed to the ACL, consistent with the most recent assessments for these stocks used to set the respective quotas.

[3] Accounting of research catch varies according to research program, consistent with MSA requirements and research permit policy.

*Some or all catch attributed to separate sub-ACL, and so is not included above.

Values in metric tons of live weight

Source: NMFS Greater Atlantic Regional Fisheries Office, September 24, 2024, run date of August 31, 2024

Table 47 Continued.

Stock	Total	SCUP	SHRIMP	SQUID	SQUID/ WHITING	SURF CLAM	WHELK/ CONCH	WHITING	UNCATEGORIZED	RECREATIONAL
GB Cod	219.4	0.0	0.0	0.6	0.4	0.1	-	0.0	4.5	206.9
GOM Cod	1.1	-	-	-	-	-	-	-	0.6	-*
GB Haddock	4.4	-	0.0	0.6	0.2	-	-	0.0	0.2	
GOM Haddock	0.2	0.0	-	0.0	0.0	-	-	0.0	0.0	-*
GB Yellowtail Flounder	0.0	-	-	-*	-*	-	-	-	0.0	
SNE Yellowtail Flounder	0.0	-	0.0	0.0	-	-	-	-	0.0	
CC/GOM Yellowtail Flounder	43.0	0.0	-	0.4	6.7	-	-	0.1	3.7	
American Plaice	26.6	0.0	0.1	0.3	0.2	-	-	0.0	1.0	
Witch Flounder	56.8	2.9	0.0	11.9	2.5	-	-	0.0	4.0	
GB Winter Flounder	56.1	-	-	0.1	0.0	-	-	-	0.1	
GOM Winter Flounder	2.7	0.0	-	0.0	0.0	-	-	0.0	0.3	-
SNE Winter Flounder	61.4	4.6	0.1	19.4	3.1	0.6	-	0.0	5.6	0.9
Redfish	8.8	-	0.0	3.4	0.3	-	-	0.0	4.6	
White Hake	5.4	0.0	0.0	0.2	0.1	-	-	0.0	0.5	
Pollock	590.6	0.0	0.0	2.5	0.0	-	-	0.0	3.6	583.9
Northern Windowpane	2.1	0.0	-	0.3	0.6	-	-	0.0	1.0	
Southern Windowpane	240.5	34.9	0.5	88.8	8.2	0.6	-	0.0	43.0	
Ocean Pout	7.2	0.3	0.0	1.5	0.3	0.3	-	0.0	0.8	
Halibut	3.0	-	-	0.1	0.1	-	-	0.0	0.2	
Wolffish	0.0	-	-	-	-	-	-	-	0.0	

Values in metric tons of live weight
*Some or all catch attributed to separate sub-ACL, and so is not included above.
Source: NMFS Greater Atlantic Regional Fisheries Office, September 24, 2024, run date of August 31, 2024

5.7.10 Fishery Sub-Components

5.7.10.1 Commercial Harvesting Component

Commercial Groundfish Fishery In-season Utilization

Figure 13 – Figure 36 display in-season utilization for the commercial groundfish fishery (sectors and common pool) by stock/management unit for FY2019 – FY2023 and in-season FY2024. For the four new Atlantic cod stock units, in-season catch is displayed.

Figure 13 – Commercial groundfish fishery in-season catch (mt) of Eastern Gulf of Maine cod.

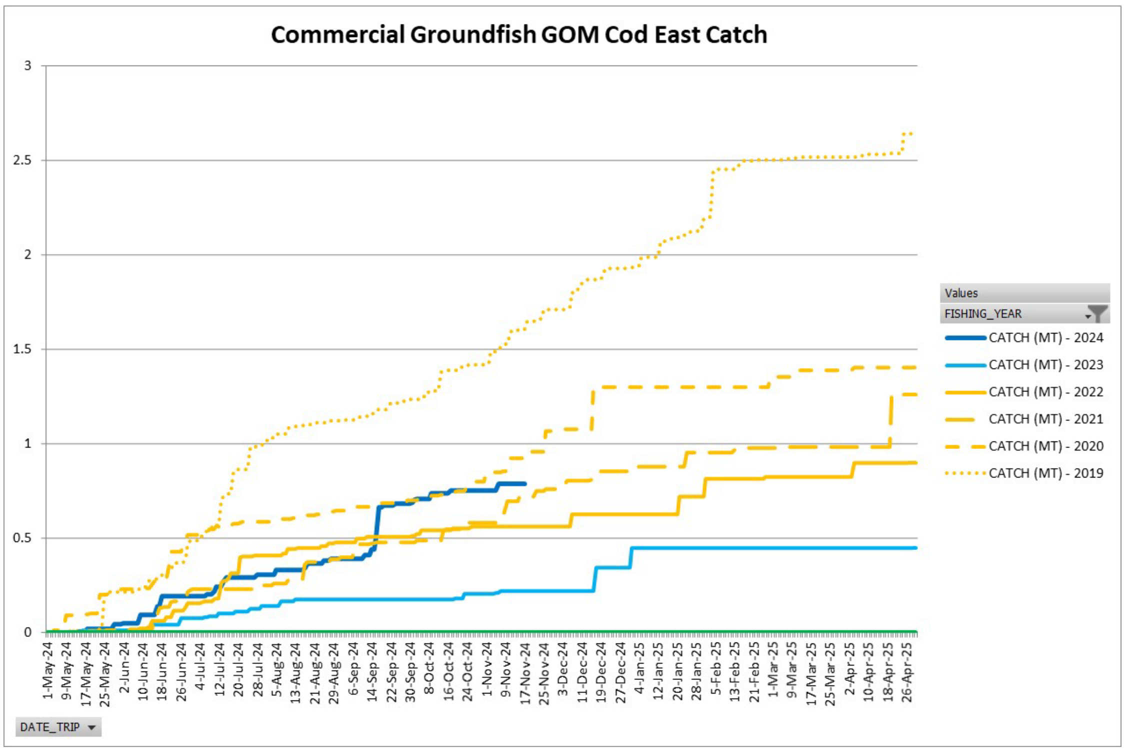


Figure 14 – Commercial groundfish fishery in-season catch (mt) of Western Gulf of Maine cod.

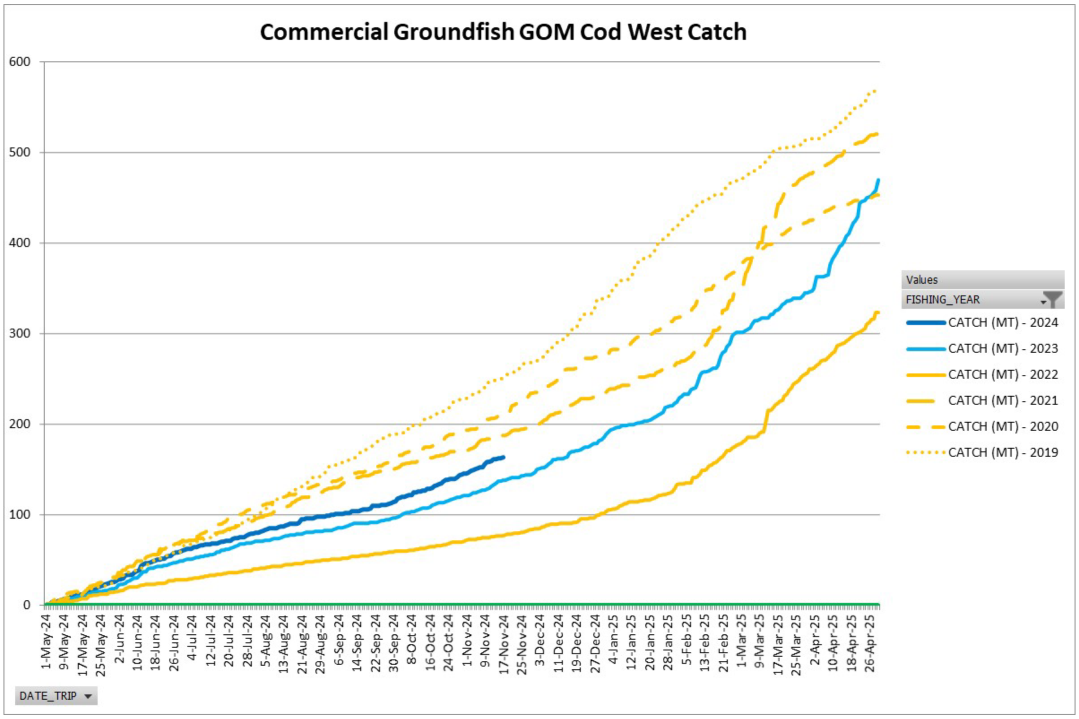


Figure 15 – Commercial groundfish fishery in-season utilization (mt) of Eastern GB cod.

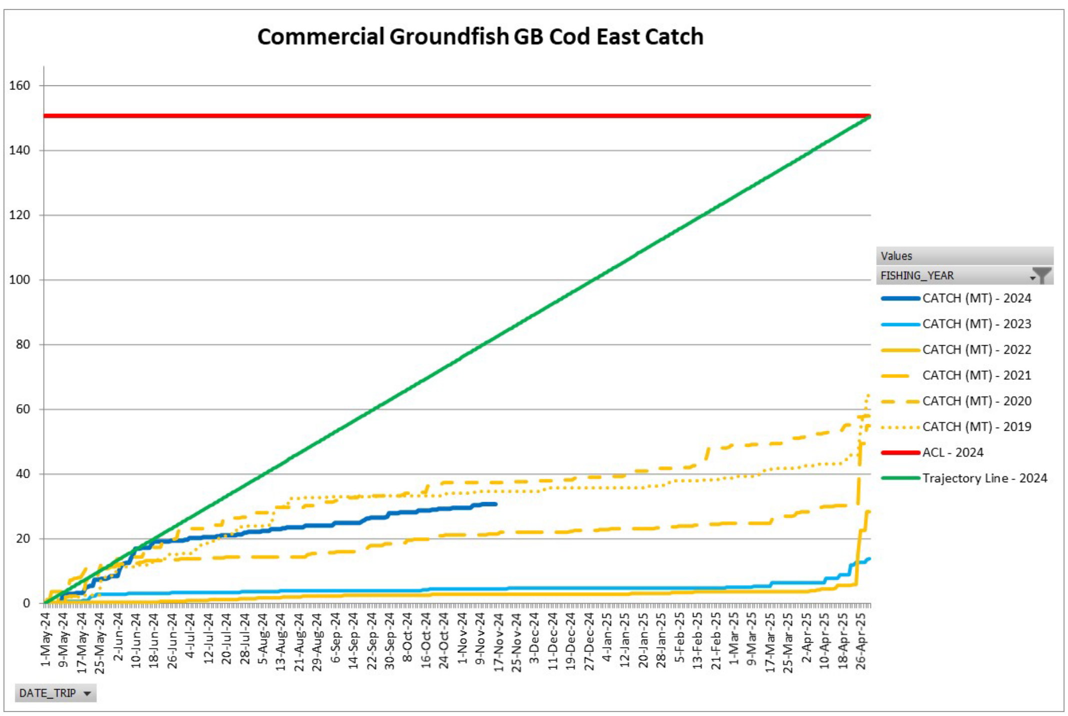


Figure 16 – Commercial groundfish fishery in-season catch (mt) of Georges Bank cod.

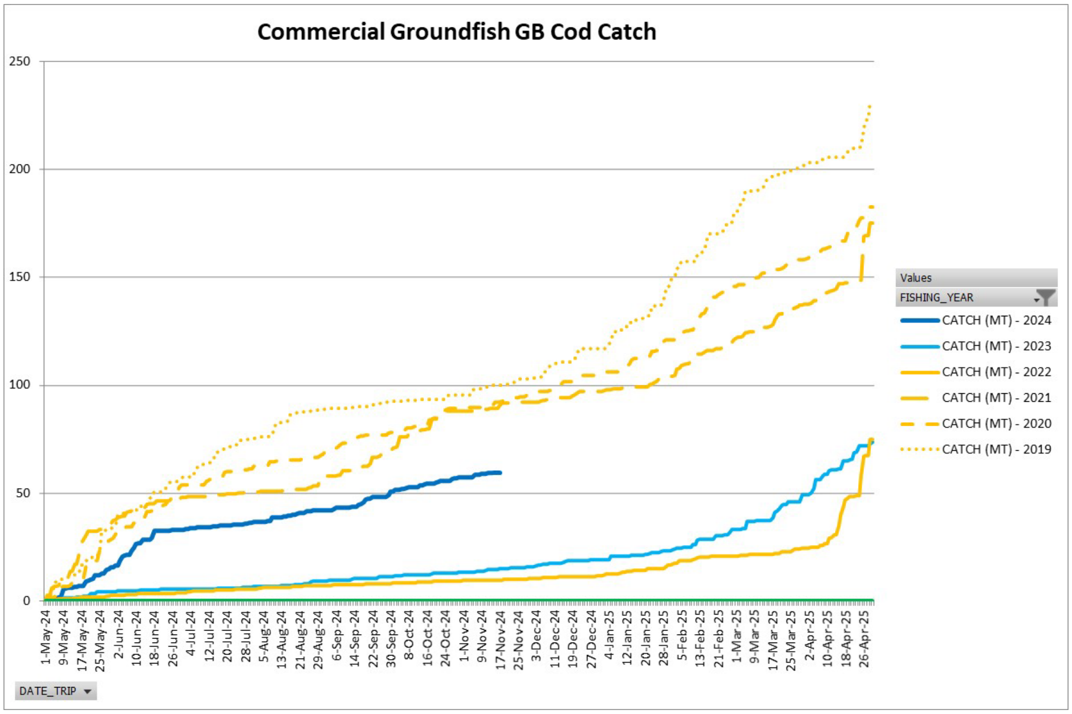


Figure 17 – Commercial groundfish fishery in-season catch (mt) of Southern New England cod.

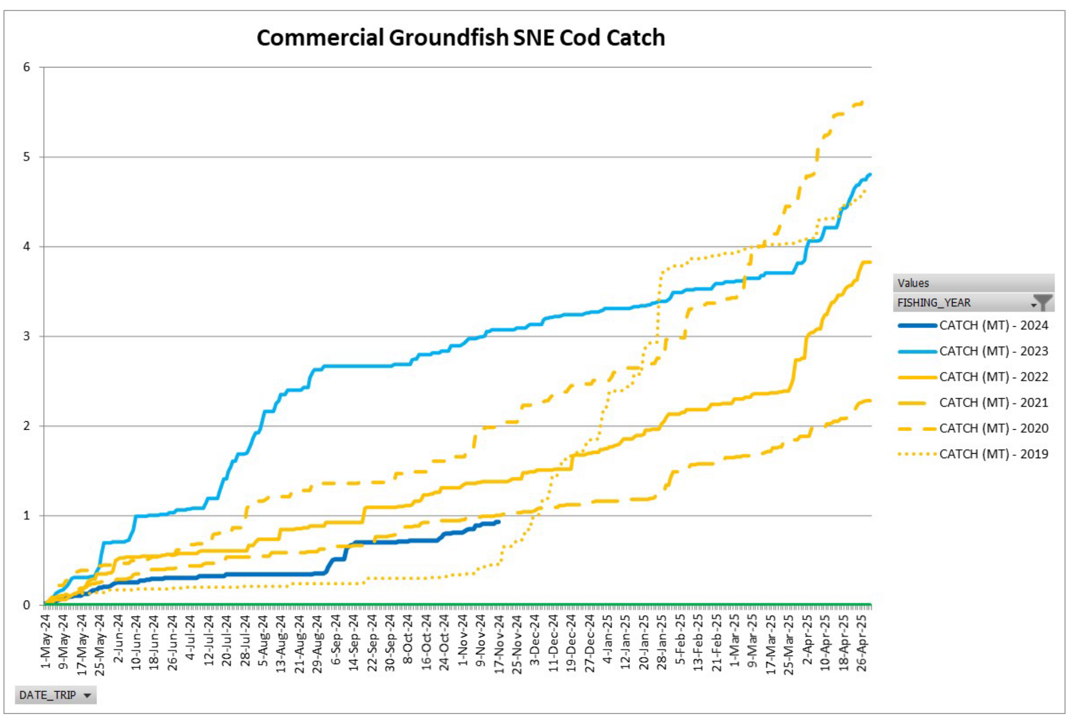


Figure 18 – Commercial groundfish fishery in-season catch (mt) of Eastern GB haddock.

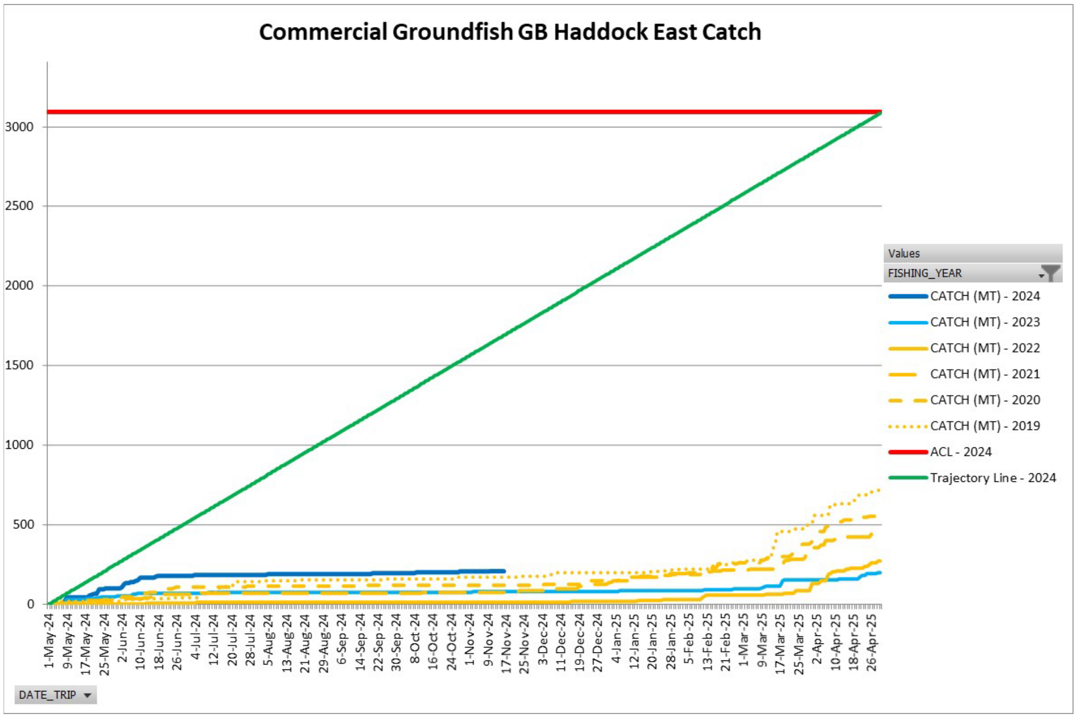


Figure 19 – Commercial groundfish fishery in-season catch (mt) of GB haddock.

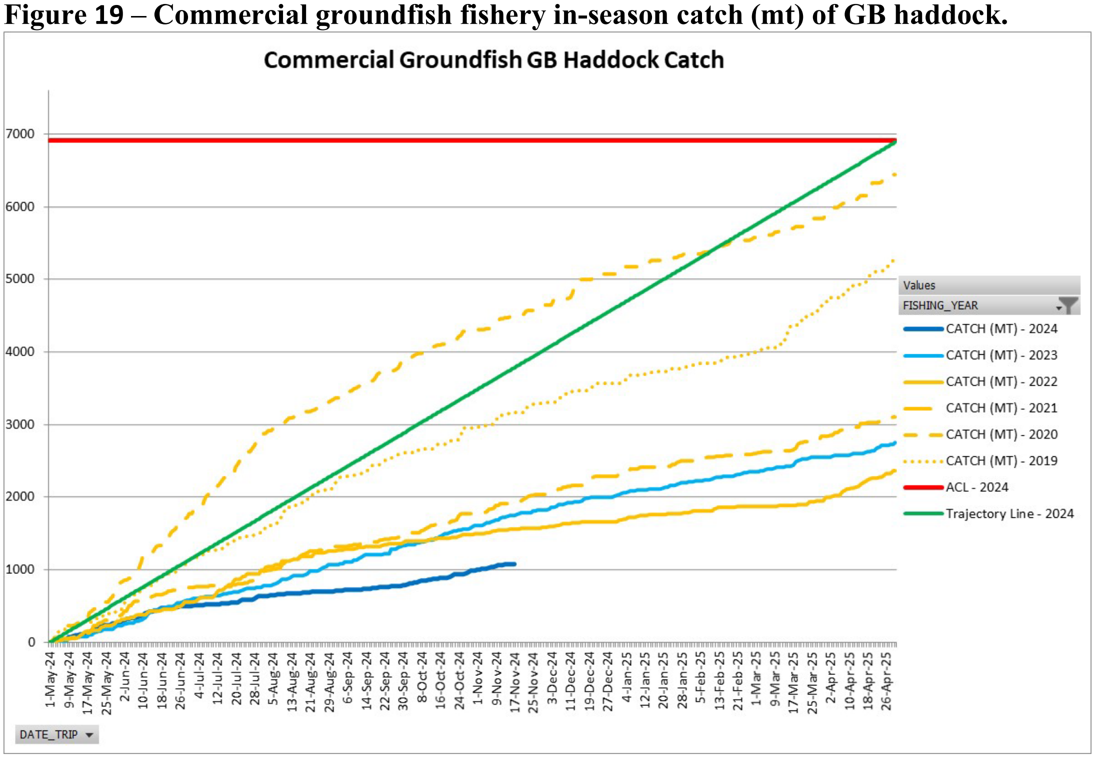


Figure 20 – Commercial groundfish fishery in-season catch (mt) of GOM haddock.

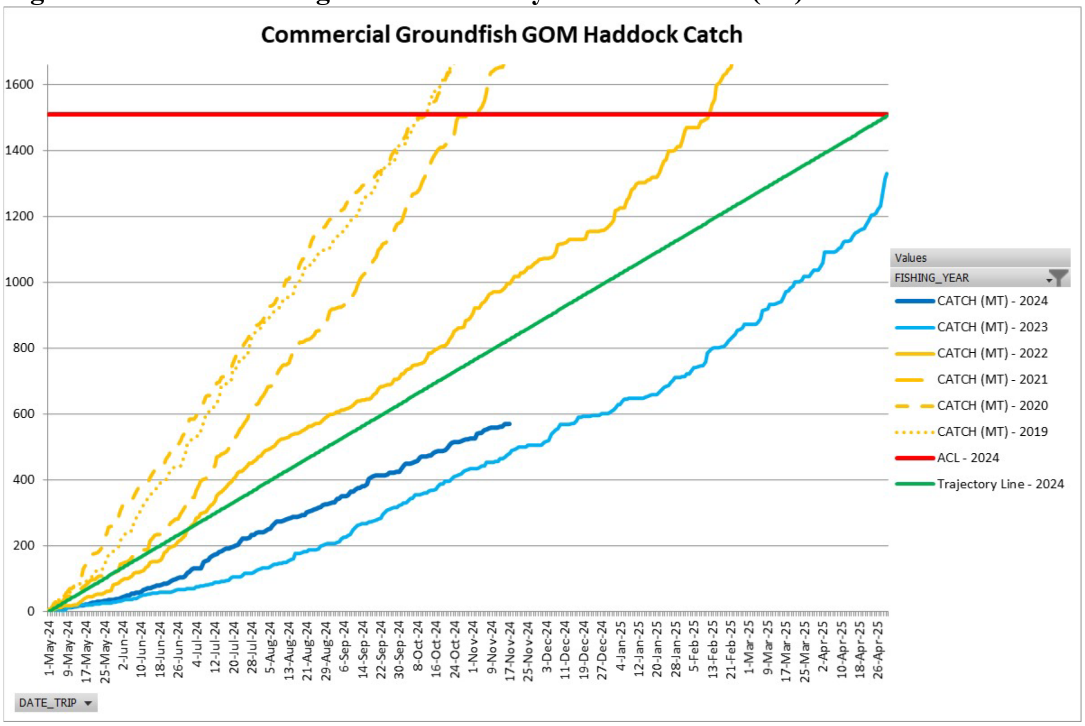


Figure 21 – Commercial groundfish fishery in-season catch (mt) of GB yellowtail flounder.

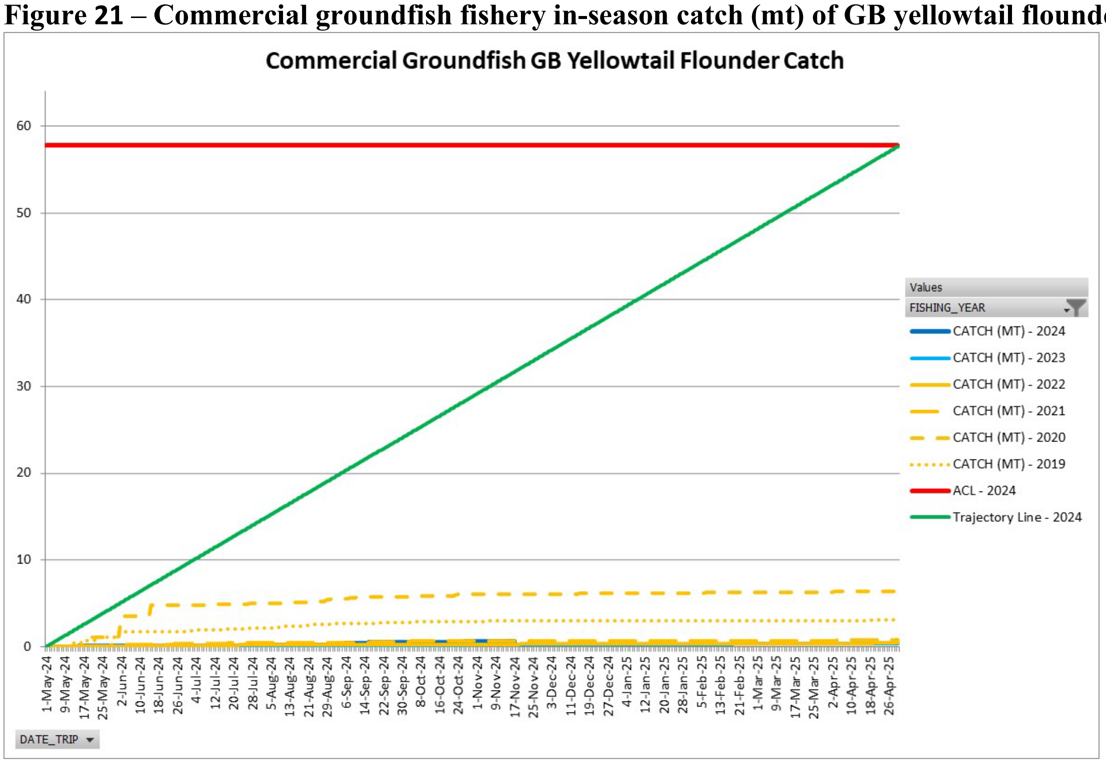


Figure 22 – Commercial groundfish fishery in-season catch (mt) of SNE/MA yellowtail flounder.

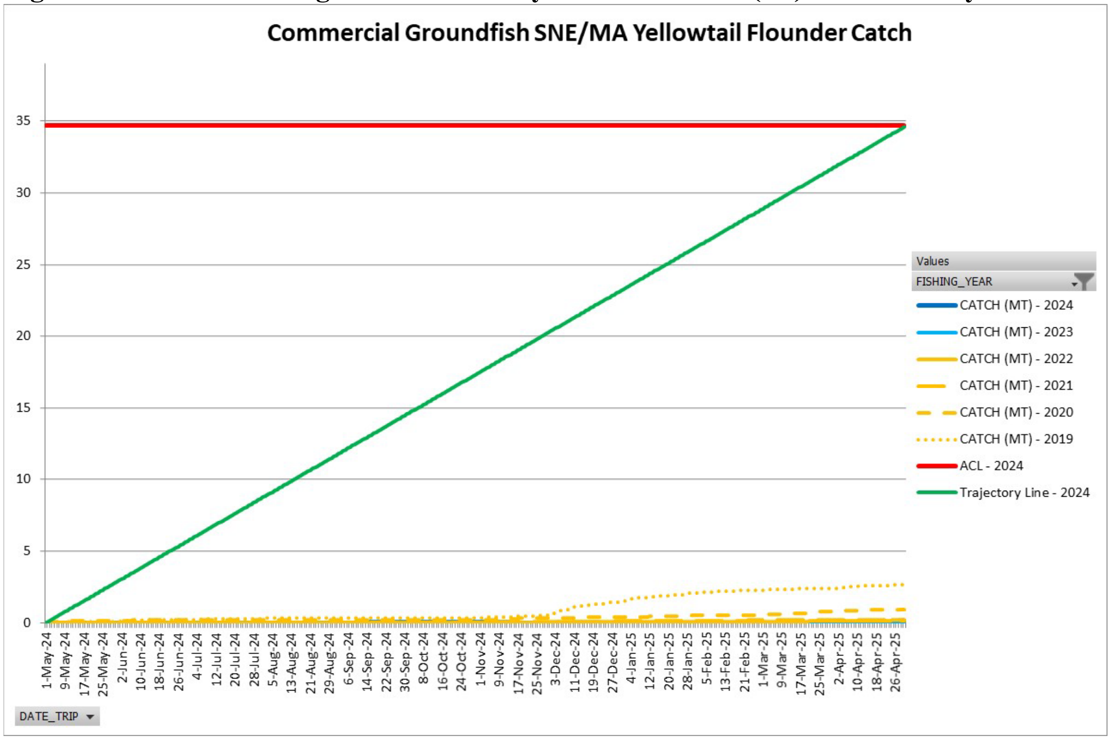


Figure 23 – Commercial groundfish fishery in-season catch (mt) of CC/GOM yellowtail flounder.

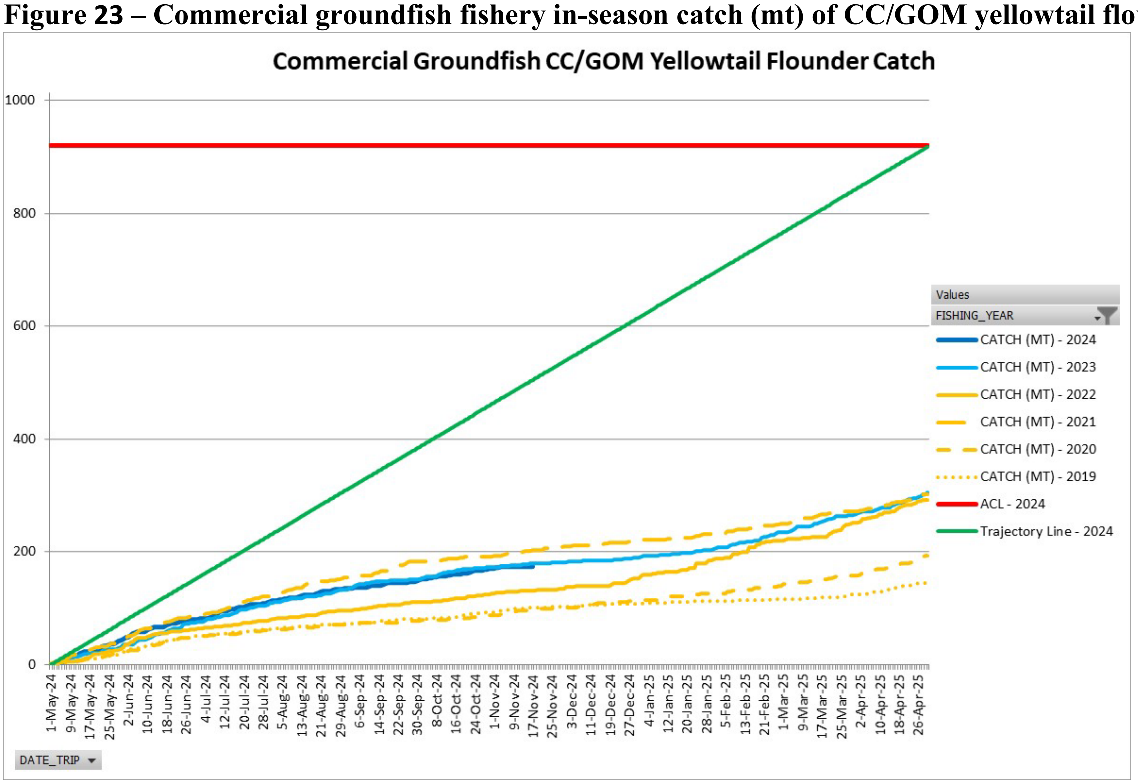


Figure 24 – **Commercial groundfish fishery in-season catch (mt) American plaice.**

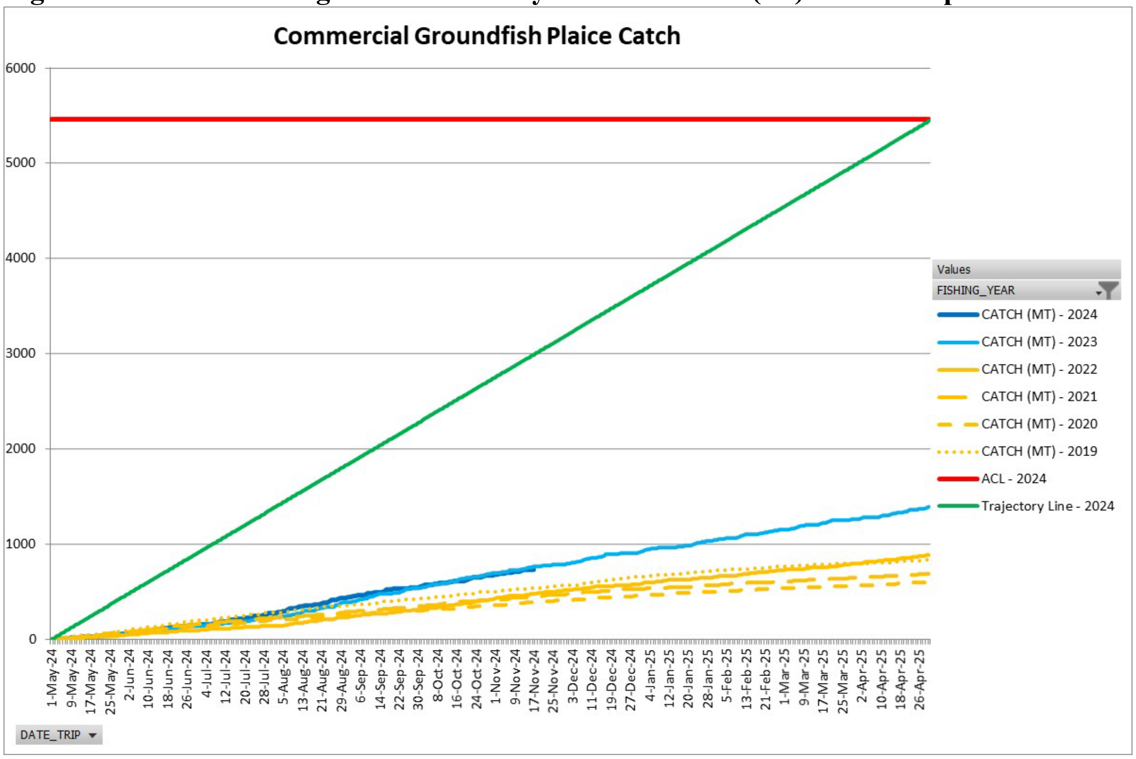


Figure 25 – **Commercial groundfish fishery in-season catch (mt) of witch flounder.**

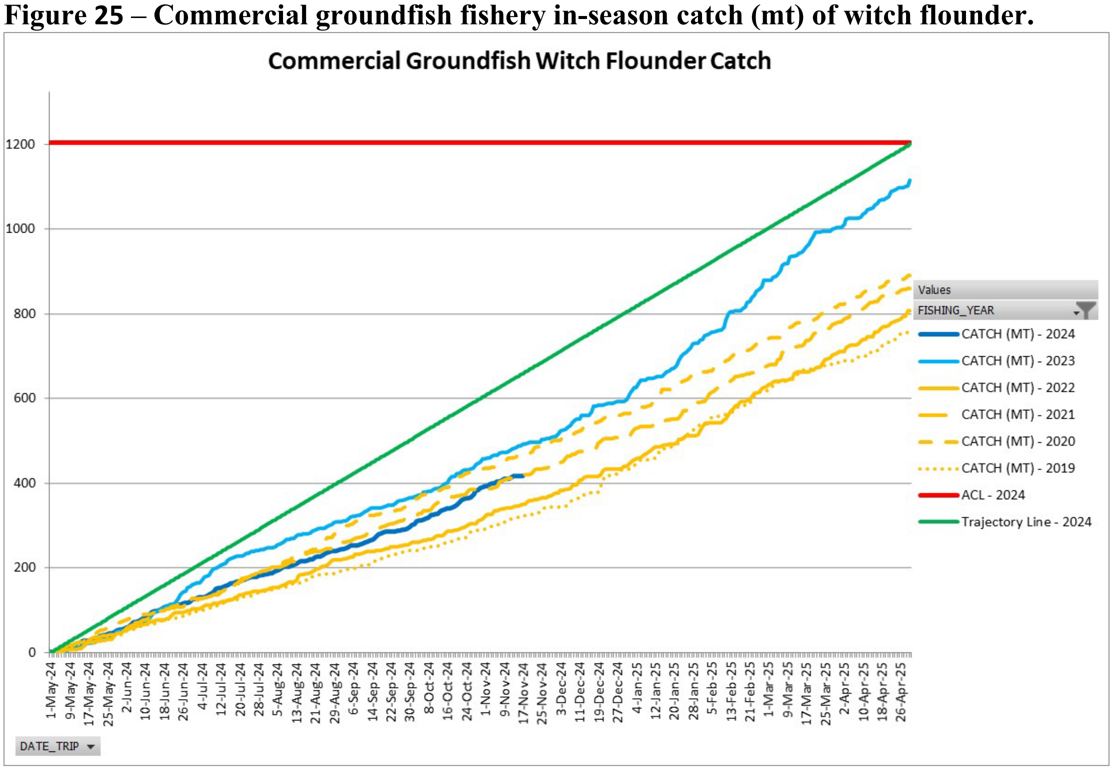


Figure 26 – **Commercial groundfish fishery in-season catch (mt) of GB winter flounder.**

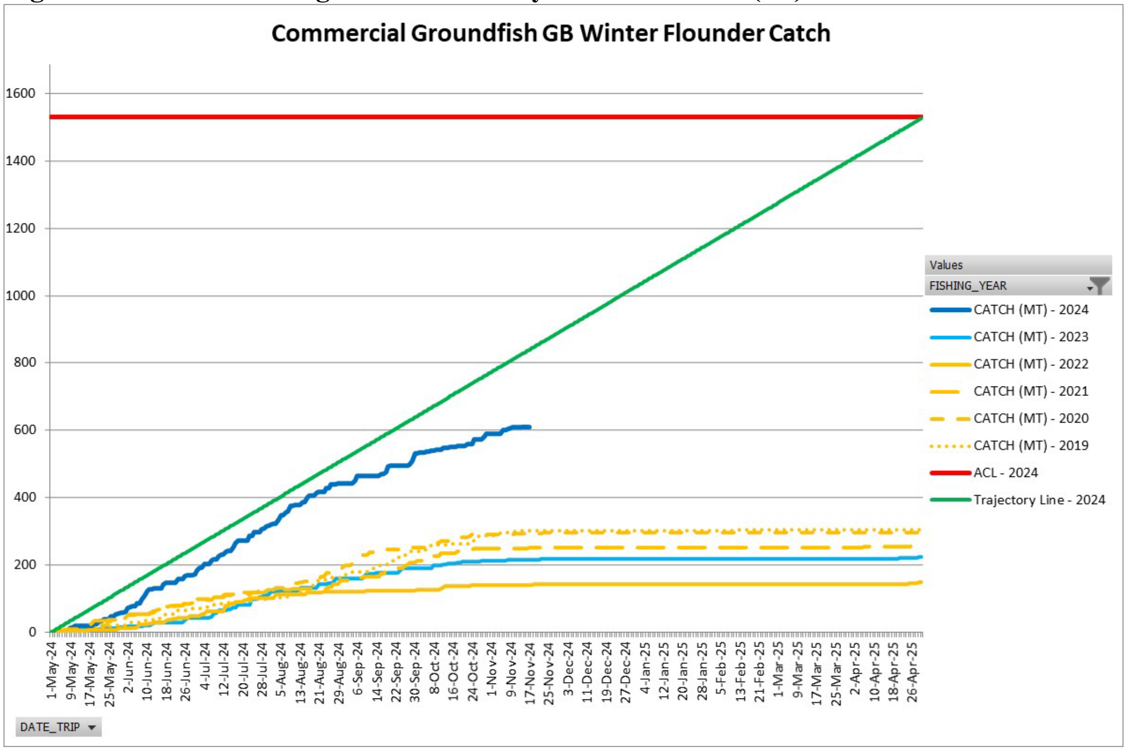


Figure 27 – **Commercial groundfish fishery in-season catch (mt) of GOM winter flounder.**

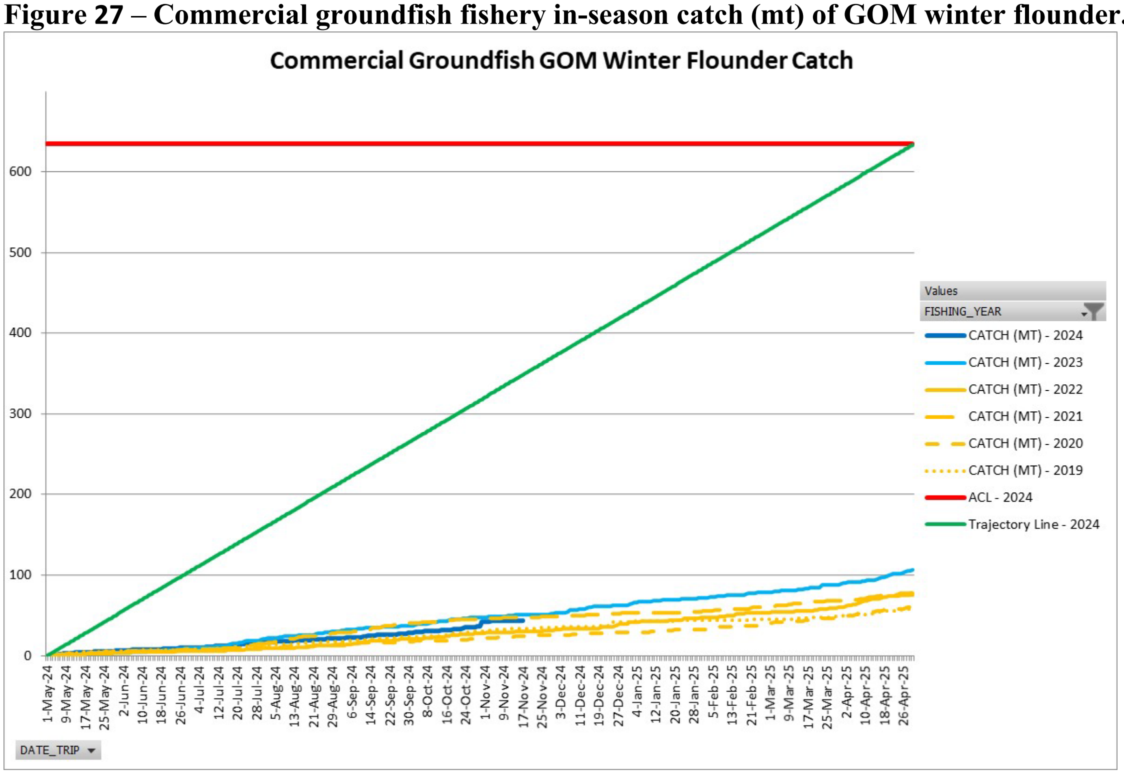


Figure 28 – Commercial groundfish fishery in-season catch (mt) of SNE/MA winter flounder.

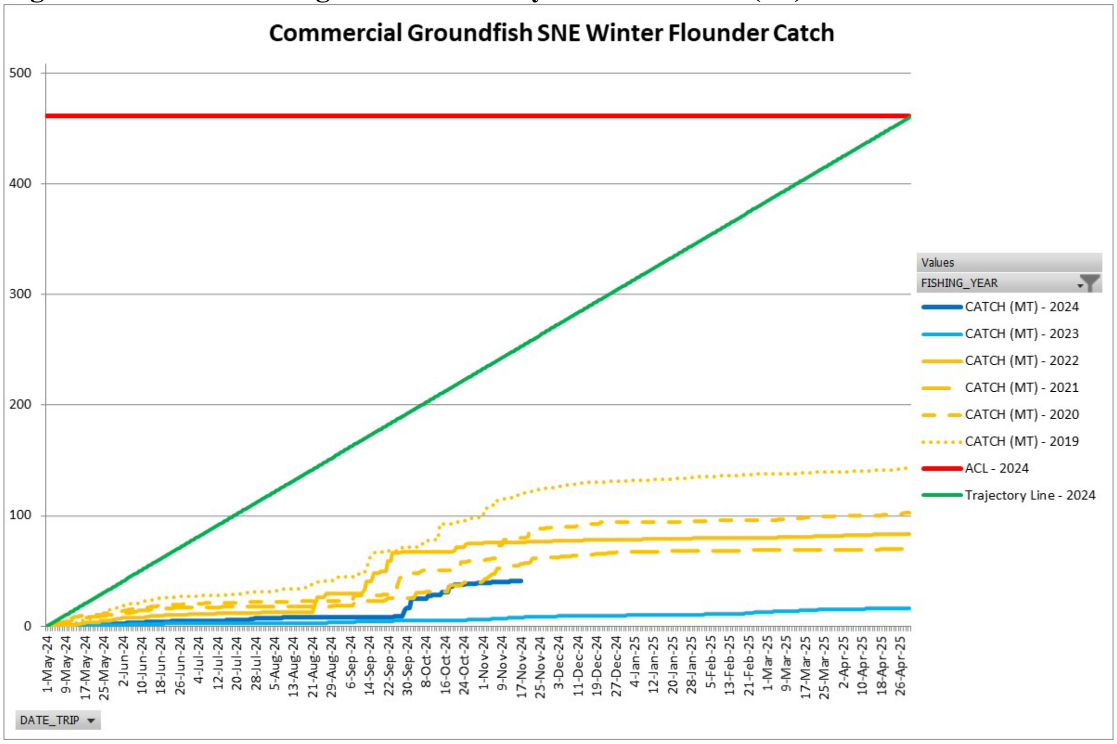


Figure 29 – Commercial groundfish fishery in-season catch (mt) of redfish.

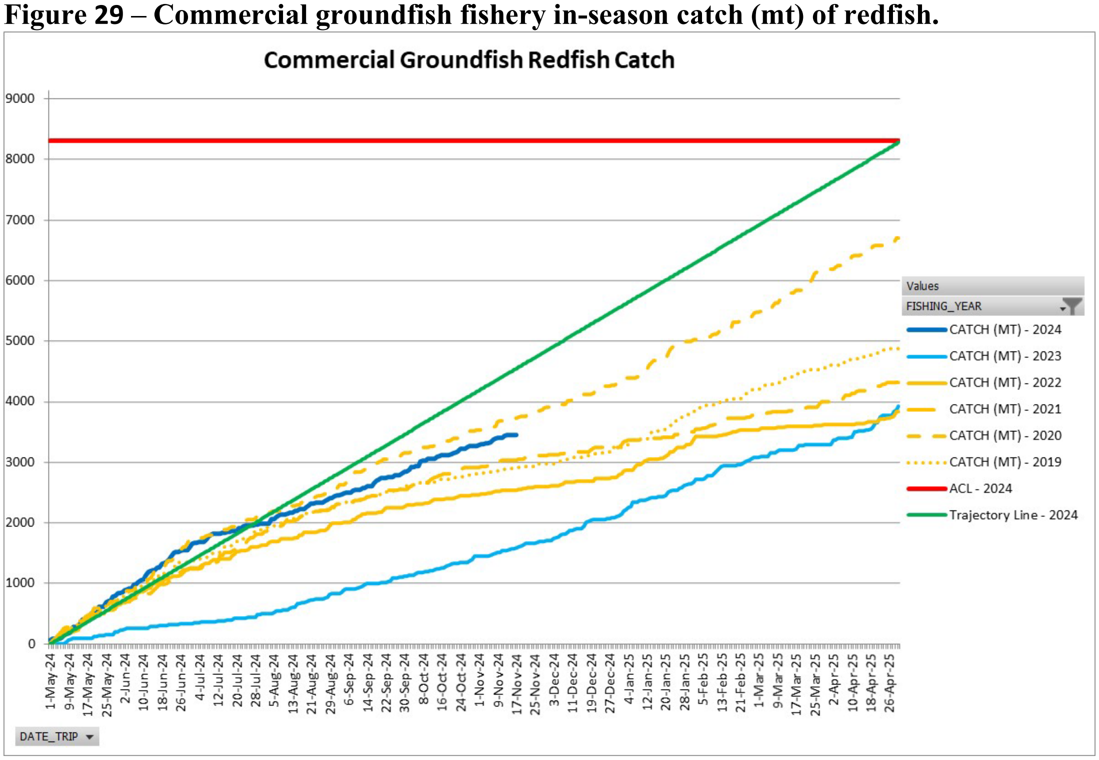


Figure 30 – Commercial groundfish fishery in-season catch (mt) of white hake.

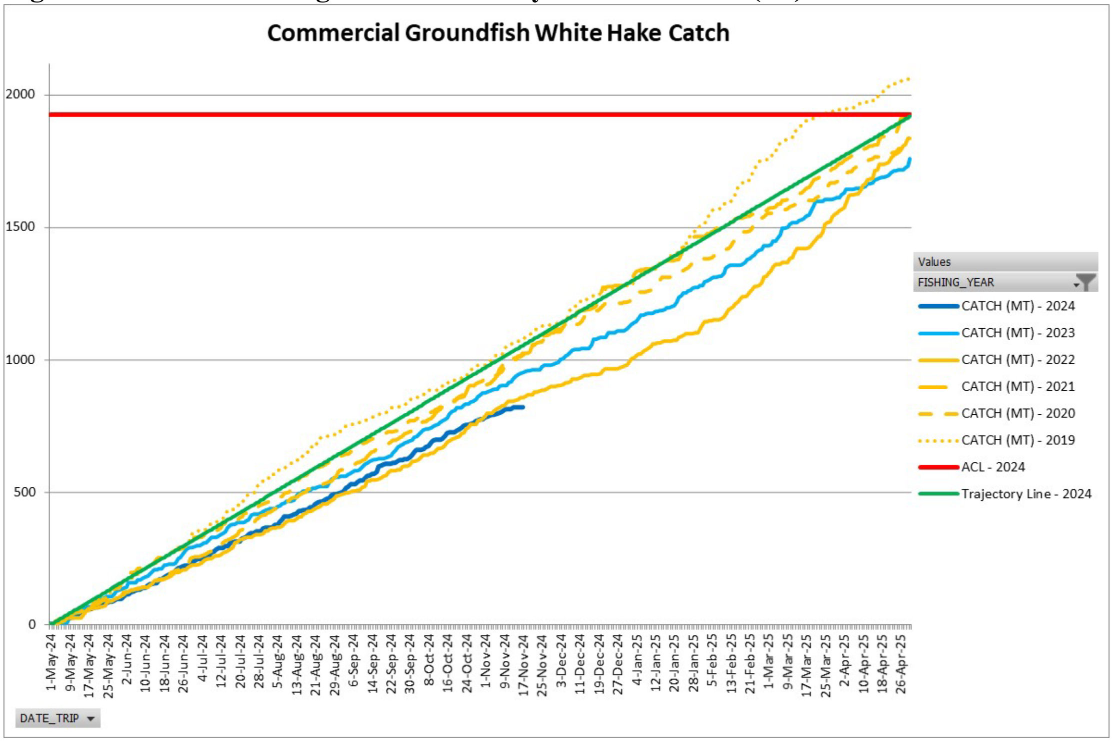


Figure 31 – Commercial groundfish fishery in-season catch (mt) of pollock.

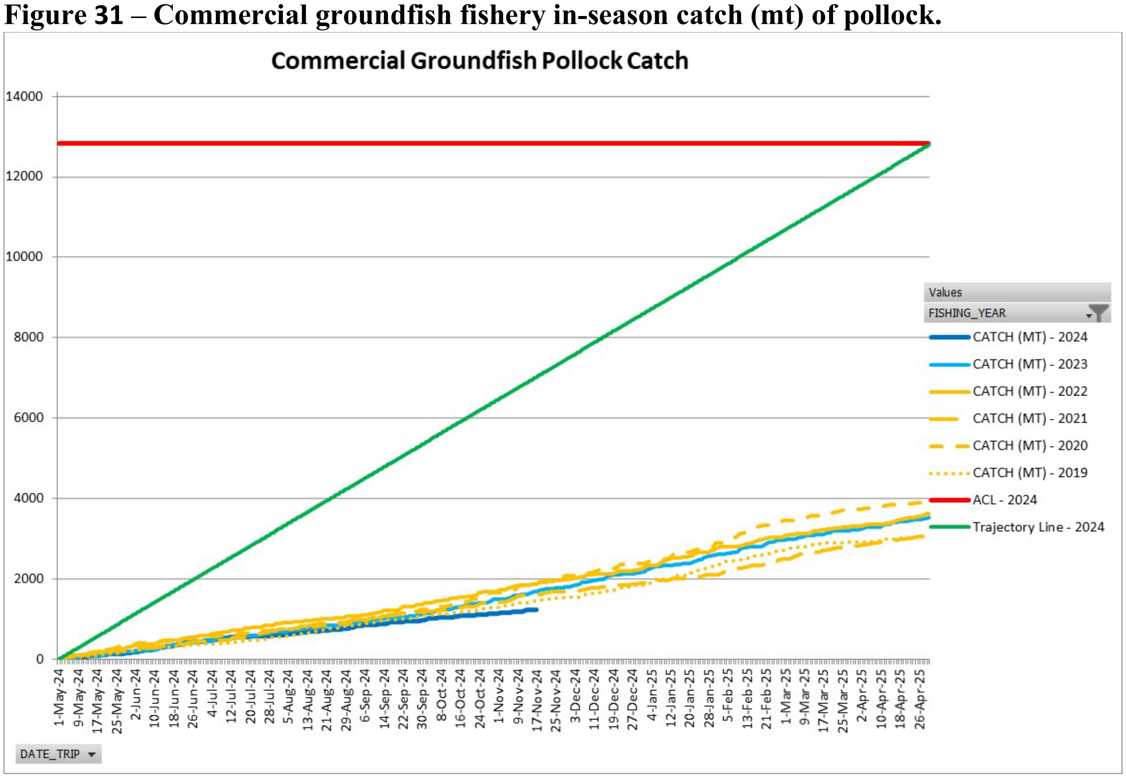


Figure 32 – Commercial groundfish fishery in-season catch (mt) of Atlantic halibut.

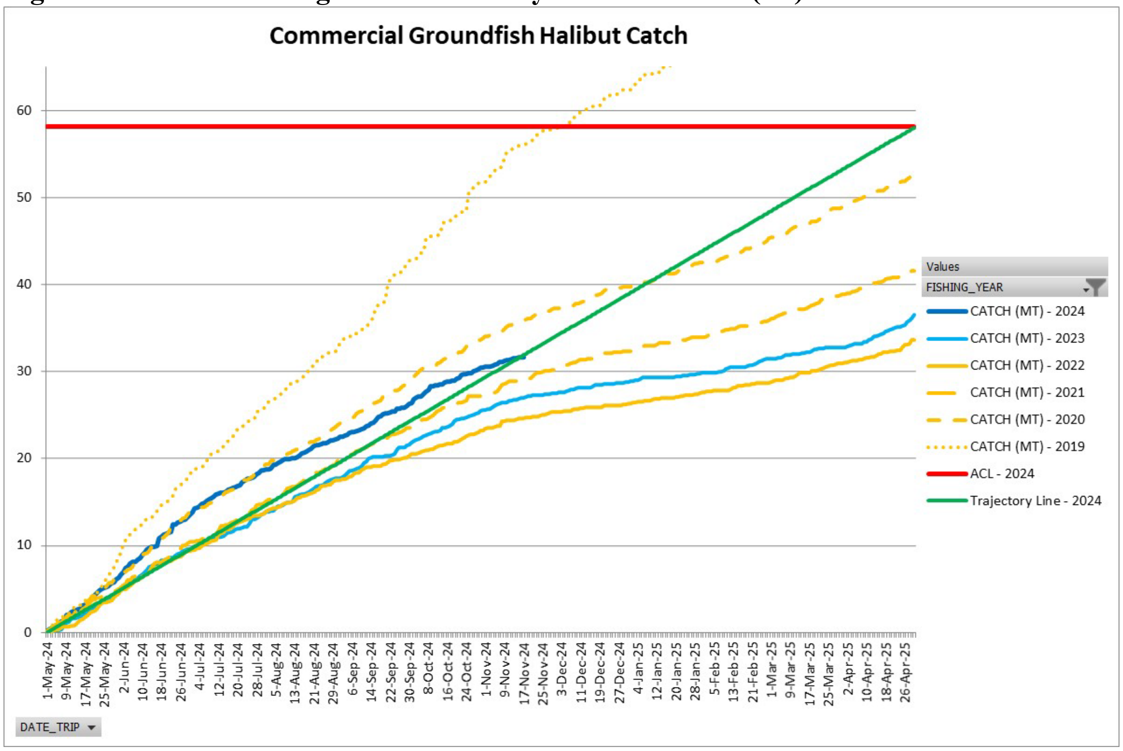


Figure 33 – Commercial groundfish fishery in-season catch (mt) of northern windowpane flounder.

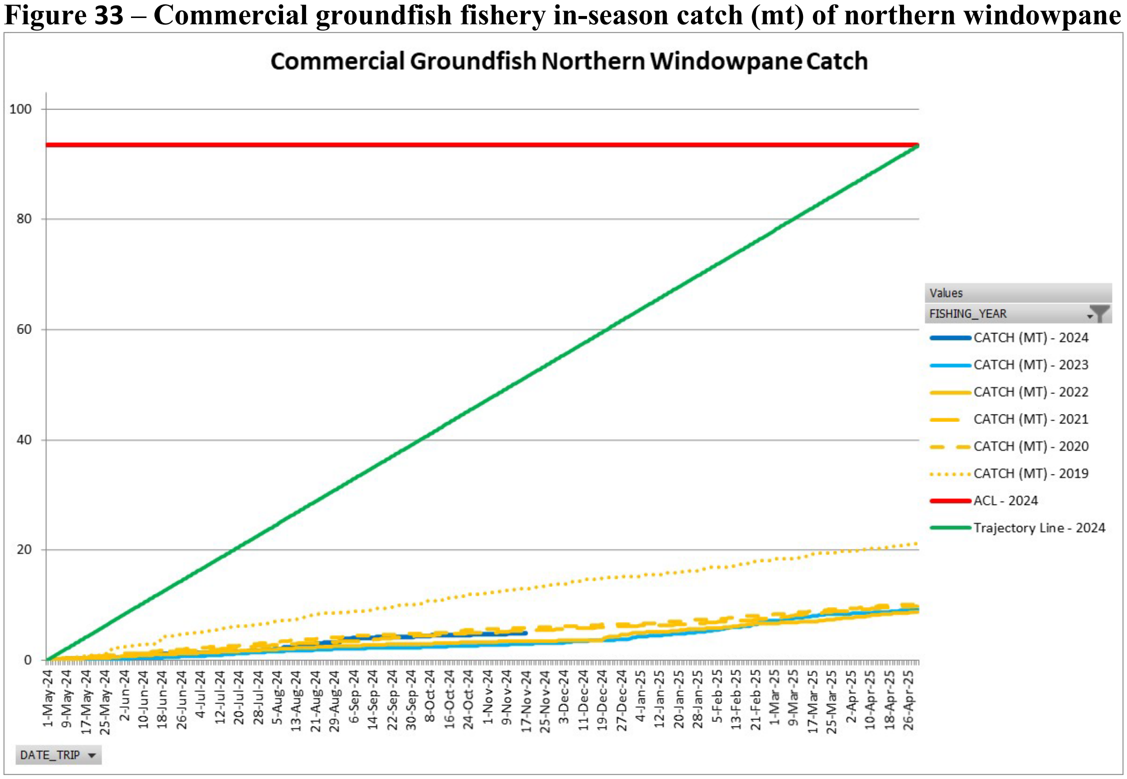


Figure 34 – Commercial groundfish fishery in-season catch (mt) of southern windowpane flounder.

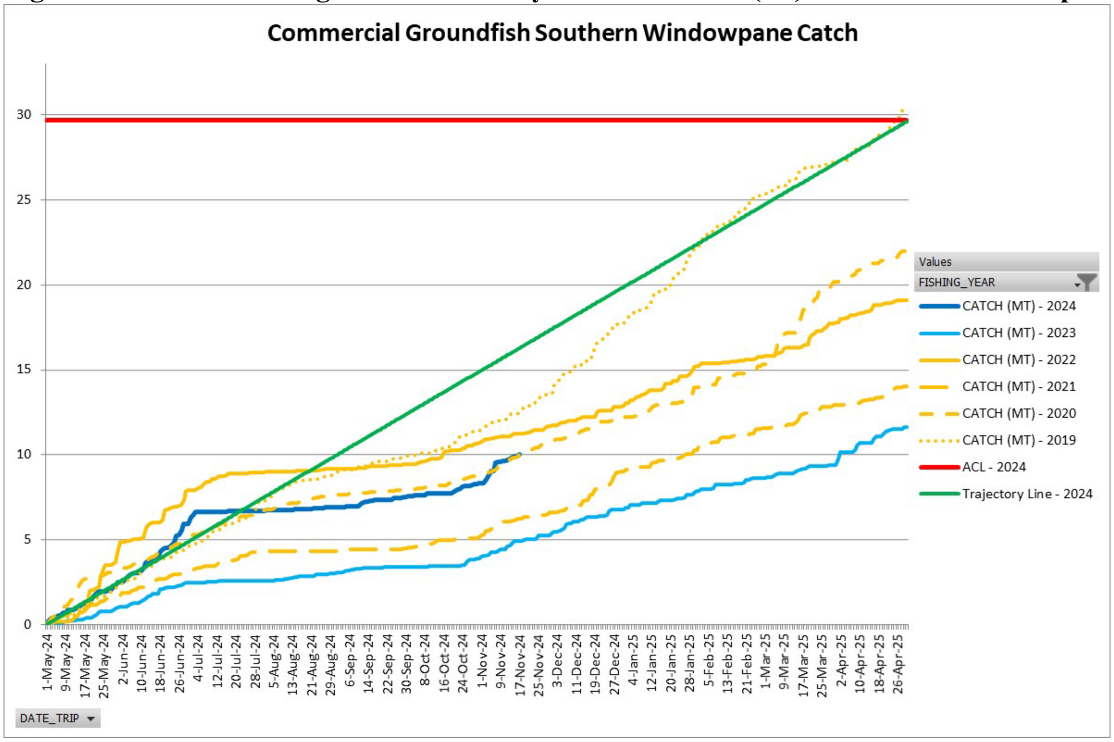


Figure 35 – Commercial groundfish fishery catch (mt) utilization of ocean pout.

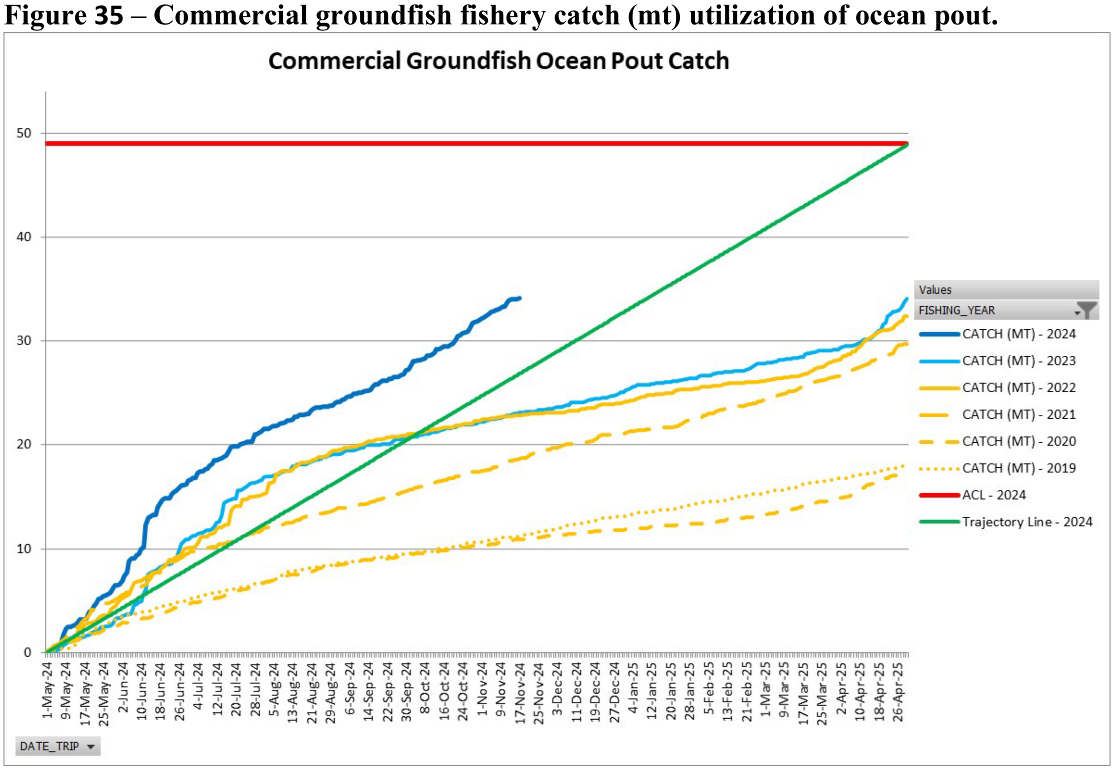
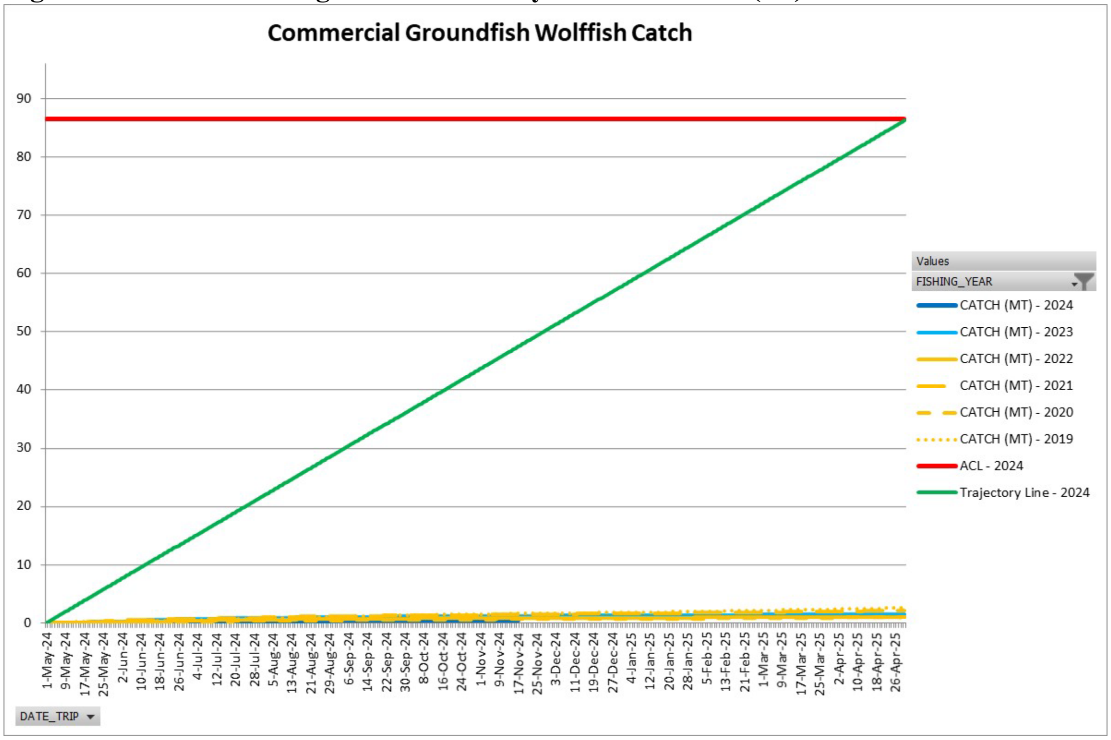


Figure 36 – Commercial groundfish fishery in-season catch (mt) of wolffish.



5.7.10.1.1 Sector Harvesting Component

In all years, the sector vessels landed the overwhelming majority of groundfish landed (Table 22). Each sector receives a total amount of fish it can harvest for each stock, its Annual Catch Entitlement (ACE). Since the ACE is dependent on the amount of the ACL in a given fishing year, the ACE may be higher or lower from year to year even if the sector's membership remains the same. There have been large shifts in commercial groundfish sub-ACLs for various stocks between FY2019 and FY2023. There has been a general decrease in trips, and catch for sector vessels, and there has been a shift in effort out of the groundfish fishery into other fisheries. However, these changes may correlate to a certain extent with the decrease in ACL.

Of the 16 ACEs allocated to sectors in 2023, five stocks/management units, GB cod west, GOM cod, GOM haddock, witch flounder and white hake, approached the catch limit (>80% conversion) set by the total allocated ACE (Table 48). This is an increase in the number of stocks with high utilization compared to previous years (FY2019-FY2022) with some notable increase in utilization for several stocks. Utilization of white hake has generally increased over the time period with utilization at 96.6% in FY2023. Utilization of witch flounder increased sharply in FY2023 at 99.1% (from 62% in FY2022), as did utilization of GOM haddock (from 40.9% in FY2022 to 86.1% in FY2023). In FY2023, GB haddock also saw an increase in utilization from previous years. Utilization of GB yellowtail flounder and SNE/MA yellowtail flounder in FY2023 was very low at less than 1% each.

Table 48 – Annual sector catch entitlement (ACE), catch, and utilization (metric tons)

	2019			2020			2021		
	Allocated ACE*	Sector Catch	% Caught	Allocated ACE*	Sector Catch	% Caught	Allocated ACE*	Sector Catch	% Caught
GB Cod East	182.5	65.8	36%	183	57.0	31.2%	182.1	56.4	31%
GB Cod West	1,514.4	530.5	35%	1,041.3	421.9	40.5%	1045.2	468.0	44.8%
GOM Cod	349.6	280.9	80.3%	266.6	221.8	83.2%	262.2	230.9	88.1%
GB Haddock East	14,762.3	715.6	4.8%	15,861.4	562.8	3.5%	6267.3	442.7	7.1%
GB Haddock West	52,431.7	5,293.50	10.1%	119,409.5	6,488.7	5.4%	74096.3	3,116.2	4.2%
GOM Haddock	8,215.7	3,544.40	43.1%	11,754.2	4,023.9	34.2%	10022.8	3,446.5	34.4%
GB Yellowtail Flounder	96.9	3.1	3.2%	92	6.4	6.9%	58.5	0.8	1.3%
SNE/MA Yellowtail	36.2	2.5	7%	12.5	0.9	6.9%	12	0.2	1.9%
CC/GOM Yellowtail	376.7	141.1	37.4%	656.4	182.2	27.8%	650.5	283.7	43.6%
American Plaice	1,436	836.1	58.2%	2,859.4	592.3	20.7%	2591.9	688.1	26.5%
Witch Flounder	830.6	761	91.6%	1,274.8	892.7	70%	1273.1	843.2	66.2%
GB Winter Flounder	742.1	306.2	41.3%	501.6	289.9	57.8%	516.5	261.9	50.7%
GOM Winter Flounder	336.5	56.9	16.9%	272.1	55.3	20.3%	267	68.7	25.7%
SNE Winter Flounder	444.1	135.1	30.4%	475.3	97.4	20.5%	247.4	64.9	26.2%
Redfish	10,914.6	4,956.90	45.4%	11,084.7	6,711.60	60.5%	9537.3	4,352.9	45.6%
White Hake	2,714.2	2,057.40	75.8%	1,994.8	1,820.30	91.3%	1994.2	1,929.7	96.8%
Pollock	37,152	3,070.10	8.3%	23,752.3	3,936.10	16.6%	18355.5	3,069.4	16.7%

*Does not include Sector Carryover or Overages.
Source: NMFS Greater Atlantic Regional Fisheries Office, Summary Tables for Northeast Multispecies Fishery, Accessed October 2023

Table 48 cont.

	2022			2023		
	Allocated ACE*	Sector Catch	% Caught	Allocated ACE*	Sector Catch	% Caught
GB Cod East	155.9	27.9	17.9%	131.2	13.4	10.3%
GB Cod West	237.6	148.0	62.3%	364.2	294.8	80.9%
GOM Cod	261.1	246.9	94.6%	267.5	236.6	88.4%
GB Haddock East	6,538.5	255.7	3.9%	1475.1	190.2	12.9%
GB Haddock West	74,375.1	2,355.1	3.2%	10829.4	2,744.40	25.3%
GOM Haddock	6,915	2,830.7	40.9%	1537.1	1,322.70	86.1%
GB Yellowtail Flounder	94	0.5	.5%	79.8	0.3	0.4%
SNE/MA Yellowtail	12.2	0.2	1.3%	25.3	0	0.2%
CC/GOM Yellowtail	660.7	286.8	43.4%	930.7	299.4	32.2%
American Plaice	2,566.1	886.9	34.6%	5209.9	1,383.10	26.5%
Witch Flounder	1,277.5	791.6	62%	1104.4	1,094.60	99.1%
GB Winter Flounder	551.1	147.7	26.8%	1584.6	221.7	14%
GOM Winter Flounder	259.3	75.2	29%	518.9	105.1	20.3%
SNE Winter Flounder	250	77.8	31.1%	387.4	13.7	3.5%
Redfish	9,459.3	3,856.3	40.8%	9369.4	3,921.20	41.9%
White Hake	1970	1,823.8	92.6%	1808	1,746.50	96.6%
Pollock	14,020	3,612.7	25.8%	13001.3	3,496.60	26.9%

*Does not include Sector Carryover or Overages.
Source: NMFS Greater Atlantic Regional Fisheries Office, Summary Tables for Northeast Multispecies Fishery, Accessed November 2024

5.7.10.1.2 Common Pool Harvesting Component

With the adoption of Amendment 16, most commercial groundfish fishing activity occurs under sector management regulations. Some vessels have elected to not join sectors and continue to fish under the effort control system. Collectively, this part of the fishery is referred to as the "common pool." These vessels fish under both limited access and open access groundfish fishing permits. Common pool vessels accounted for only a small amount of groundfish catch in FY2023 (Table 22).

Groundfish landings and revenue from common pool vessels have fluctuated over time. Common pool vessels with limited access permits landed 0.1M lbs. of regulated groundfish in FY2019, worth $0.27M in ex-vessel revenues. Landings increased to 0.19M lbs. in FY2022, worth $0.42M, and in FY2023 landings remained the same at 0.19M lbs. but declined in ex-vessel revenues to $0.34M (Table 22).

In FY2023, one stock, GOM cod, exceeded the catch limit (>100% conversion) as set by the sub-ACL allocated to the common pool. GB cod west approached 60% conversion, and witch flounder approached 50% conversion. GB haddock east approached 35% conversion, an increase in utilization from previous years. All other stocks were below 20% conversion (Table 49).

Table 49 – Annual common pool sub-ACL, catch, and utilization (metric tons).

	2019			2020			2021		
	Sub-ACL	Catch	% Caught	Sub-ACL	Catch	% Caught	Sub-ACL	Catch	% Caught
GB Cod East	6.5	0	0%	5.5	0	0%	8.4	0	0%
GB Cod West	53.8	1.9	3.5%	31.4	3.3	10.6%	47.9	2.8	5.8%
GOM Cod	10.9	5.8	53.3%	8.7	3.2	36.4%	8.2	4.1	49.7%
GB Haddock East	237.7	0	0%	326.3	0	0%	213.8	0	0%
GB Haddock West	844.3	0.6	0.1%	2,454.40	0.6	0%	2,525.9	0.3	0%
GOM Haddock	96.1	13.1	13.7%	303.1	36.2	11.9%	258.0	4.3	1.7%
GB Yellowtail Flounder	2.9	0	0%	3.4	0	0%	5.1	0	0%
SNE/MA Yellowtail	9	0.3	3.2%	2.9	0.1	2.9%	3.6	0	0.6%
CC/GOM Yellowtail	21.4	5.1	23.9%	31.6	6.7	21.2%	41.4	19.7	47.7%
American Plaice	31.4	4.5	14.2%	77.9	8.1	10.4%	90.3	4.1	4.5%
Witch Flounder	23.1	2.9	12.7%	35.4	1.4	4%	44.2	20.7	46.7%
GB Winter Flounder	31.8	0	0%	20.8	0	0%	46.7	0	0%
GOM Winter Flounder	18.1	1.8	9.9%	14.5	4.3	30%	13.9	9.8	70.3%
SNE Winter Flounder	73.9	8.7	11.8%	63.4	5.8	9.1%	40.7	4.2	10.4%
Redfish	57.2	0.4	0.7%	146.8	0.5	0.3%	139.4	0.1	0.1%
White Hake	21.1	6.8	32.3%	24.5	0.3	1.1%	25.1	0.4	1.7%
Pollock	248.1	15.6	6.3%	236.4	1.1	0.5%	193.1	0.4	0.2%

Table 49 cont.

	2022			2023		
	Sub-ACL	Catch	% Caught	Sub-ACL	Catch	% Caught
GB Cod East	4.1	0.0	0%	3.8	0.2	6.1%
GB Cod West	6.3	4.0	63.8%	10.7	5.9	55%
GOM Cod	8.8	8.6	97.9%	10.6	10.9	103.3%
GB Haddock East	88.5	0.0	0%	34.4	10.7	31.1%
GB Haddock West	1,006.8	0.1	0%	250.5	12.3	4.9%
GOM Haddock	140.9	15.1	10.7%	32	2.7	8.3%
GB Yellowtail Flounder	3.0	0.0	0%	4.5	0	0%
SNE/MA Yellowtail	3.4	0.0	0.7%	8.1	0	0.2%
CC/GOM Yellowtail	31.2	6.8	21.8%	54.4	5.2	9.5%
American Plaice	64.0	4.9	7.6%	150	7.5	5%
Witch Flounder	39.8	20.5	51.5%	41.1	20.1	48.8%
GB Winter Flounder	12.1	0.0	0%	49.8	1.4	2.9%
GOM Winter Flounder	21.6	0.6	2.6%	88.3	0.6	0.7%
SNE Winter Flounder	38.1	5.4	14.1%	53.4	2.9	5.4%
Redfish	99.6	1.8	1.8%	99.3	4.1	4.1%
White Hake	20.1	19.6	97.3%	17.7	13.8	78%
Pollock	114.7	19.1	16.7%	122.7	22.8	18.6%

Source: NMFS Greater Atlantic Regional Fisheries Office, Summary Tables for Northeast Multispecies Fishery, Accessed October 2023.

5.7.10.2 Recreational Harvesting Component

The recreational fishery includes private anglers, party boat operators, and charter vessel operators. Several groundfish stocks are targeted by the recreational fishery, including GOM cod, GOM haddock, pollock, GOM winter flounder, and GB cod. GB haddock is targeted as well, but to a lesser extent. SNE/MA winter flounder and redfish are also target species. Wolffish was occasionally caught in the past. A16 (Section 6.2.5, NEFMC 2009) includes a detailed overview of recreational fishing activity.

This section provides data on trends in landings, permits, and effort over the last five years. Table 50 provides a summary of groundfish and non-groundfish landings (fish kept, not pounds) by state and year. NH has been the top state for party and charter groundfish landings in each of the last five fishing years. Table 51 provides information on active party/charter permits by state and year. Table 52 provides information on the number of party/charter trips by state and year.

Table 50 – Number of fish kept for groundfish and non-groundfish by state for groundfish party and charter permitted vessels, for fishing years (FY) 2019 to 2023.

Species Group/State	2019	2020	2021	2022	2023
Groundfish	263,206	276,426	362,786	322,407	357,952
CT	489	655	192	183	84
MA	62,397	80,835	91,243	78,587	68,850
ME	29,190	30,513	28,275	25,804	27,182
NH	155,372	153,913	234,415	208,852	250,481
NJ	7,984	4,569	3,688	3,701	978
NY	5,564	2,983	3,031	3,601	2,441
OTHER*	25	4	8	99	7,233
RI	2,185	2,954	1,934	1,580	703
Non-Groundfish	2,250,449	1,873,214	1,916,032	1,628,652	1,664,712
CT	288,414	181,551	157,294	156,700	147,864
MA	111,146	71,398	99,158	61,133	59,564
ME	12,363	6,937	10,326	8,516	8,198
NH	97,990	78,197	134,887	112,936	112,467
NJ	653,325	545,950	477,442	457,100	445,913
NY	840,834	771,675	805,251	595,432	644,524
OTHER*	169,724	145,909	161,839	175,247	210,298
RI	76,653	71,597	69,835	61,588	35,884
Grand Total	2,513,655	2,149,640	2,278,818	1,951,059	2,022,664

*Other includes DE, MD, NC, VA
Source: Vessel Trip Reports (VTRs), FY2019 through FY2023. For VTRs that did not include state of landing, homeport state from permit data was utilized.

Table 51 – Count of the number of active party and charter groundfish permits by homeport state, FY 2019 to 2023. "Active" is defined as taking any party or charter trip among those groundfish party or charter permit holders, independent of what was caught.

State	2019	2020	2021	2022	2023
CT	16	10	12	10	10
MA	64	66	65	65	58
ME	20	15	12	12	11
NH	13	16	16	15	16
NJ	84	78	96	116	112
NY	84	74	81	80	90
OTHER*	48	45	51	73	81
RI	35	41	39	43	38
Grand Total	364	345	372	414	416

*Other includes DE, FL, MD, NC, PA, SC, VA
Source: VTRs and permit database. A vessel is included if they: 1) have a groundfish party or charter permit (Category I) and 2) took at least one party or charter trip, as indicated on the VTR.

Table 52 – Number of trips that kept groundfish by state for groundfish party and charter permitted vessels, for FY 2019 to 2023.

State	2019	2020	2021	2022	2023
CT	37	65	40	26	21
MA	824	866	873	809	588
ME	506	398	392	343	380
NH	1009	1027	1357	1334	1341
NJ	504	556	597	501	253
NY	395	388	437	417	302
OTHER*	14	4	5	9	15
RI	212	301	253	179	122
Grand Total	3501	3605	3954	3618	3022

*Other includes DE, MD, NC, VA
Source: VTRs, FY 2019 to FY 2023. For VTRs that did not include state of landing, homeport state from permit data was utilized.

5.7.10.2.1 Gulf of Maine Cod and Gulf of Maine Haddock Recreational Effort and Catch

Table 53 provides a breakdown of the number of vessels active in the for-hire component of the recreational fishery for FY2019 to FY2023. An overview of the management history and recreational fishery performance is provided for GOM cod and GOM haddock (see Table 54 and Table 55).

Table 53 – For-hire recreational vessels catching cod or haddock from the Western Gulf of Maine.

Fishing Year	Party	Charter	Total*
2019	21	83	90
2020	19	80	89
2021	18	72	82
2022	23	64	77
2023	25	54	65

Notes: *Total may not sum due to vessels taking both categories of trips during the fishing year. Based on vessel reporting via vessel log book.
Vessels landing or discarding cod or haddock from Western Gulf of Maine statistical areas based on vessel log book.
Source: NMFS Greater Atlantic Regional Fisheries Office VTR database, November 2024.

Table 54 – Summary of Gulf of Maine cod recreational catch performance and federal management (fishing years 2010 – 2023).

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
2010	2,673	1506.9	56.4	24	10	5/1/10 to 10/31/10 and 4/16/11 to 4/30/11	11/1/10 to 4/15/11	First year of sub-ACL 33.7% of ABC with 7% management uncertainty buffer applied Groundfish Regulations: Only one line per angler, and Fillets landed by private recreational and charter/party vessels must have at least 2 sq. inches (5.08 sq. cm) of contiguous skin that allows for the ready identification of the fish species. Such fillets are required to be from legal-sized fish, but the fillets themselves would not need to meet the minimum size requirements in the regulations.
2011	2,824	1640.3	58.1	24	10	5/1/11 to 10/31/11 and 4/16/12 to 4/30/12	11/1/11 to 4/15/12	First Year: Gulf of Maine (Whaleback) Cod Spawning Protection Area: From April 1 through June 30 of each year, all recreational vessels, including private recreational and charter/party vessels, may only use pelagic hook-and-line gear, as defined below, when

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
								fishing in the Whaleback Cod Spawning Protection Area.[28]
2012	2,215	937.4	42.3	19	9	5/1/12 to 10/31/12 and 4/16/13 to 4/30/13	11/1/12 to 4/15/13	
2013	486	639.3	131.5	19	9	5/1/13 to 10/31/13 and 4/16/14 to 4/30/14	11/1/13 to 4/15/14	
2014	486			21	9	5/1/14 to 8/31/14 and 4/15/14 to 4/30/14	9/1/14 to 4/14/15	Replaced by interim action on 11/15/14
		623.3	128.3	n/a	0	closed	11/15/14 to 4/30/15	2014 interim action: Seasonal 30-minute block closures, no recreational gear capable of catching groundfish in closures

[28] **Pelagic hook-and-line gear** is defined as handline or rod and reel gear that is designed to fish for, or that is being used to fish for, pelagic species. No portion of this gear may be operated in contact with the bottom at any time.

Possession Restrictions: Any vessel fishing in the Gulf of Maine Whaleback Cod Spawning Protection Area, or the Winter Massachusetts Bay Spawning Protection Area, including pelagic hook-and-line gear by recreational vessels, is prohibited from possessing or retaining regulated species or ocean pout from April 1 through June 30 of each year.

Transiting: Recreational vessels are allowed to transit the Gulf of Maine Cod Spawning Protection Area, and Winter Massachusetts Bay Spawning Protection Area provided all gear is stowed in accordance with the regulations.

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
2015	121	84.5	69.8	n/a	0	Closed year-round		Interim action Seasonal closures removed on 5/1/16
2016	157	280.9	178.9	24	1	8/1/16 to 9/30/16	5/1/16 to 7/31/16 and 10/1/16 to 4/30/17	
2017	157			24	1	8/1/17 to 9/30/17	5/1/17 to 7/31/17 and 10/1/18 to 4/30/18	Replaced by final rule effective on 7/27/17
		245.4	156.3	n/a	0	Closed year-round		
2018	220	146.9	66.8	n/a	0	Closed year-round		First Year: Winter Massachusetts Bay Spawning Protection Area: From November 1 through January 31 of each year, all recreational vessels, including private recreational and charter/party vessels, may only use pelagic hook-and-line gear, as defined below, when fishing in the Winter Massachusetts Bay Spawning Protection Area.[1]
2019	220	79.8	36.3	21	1	9/15/19 to 9/30/19	5/1/19 to 9/14/19 and	Previous year's regulations were in effect until July 5, 2019, when these measures were implemented. Based

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
							10/1/19 to 4/30/20	on comments received on the proposed rule there will not be an open season in April 2020.
2020	193	184	95.3	21	1	9/15/20-9/30/20 and 4/1/21-4/14/21 (Private) 9/8/20-10/7/20 and 4/1/21-4/14/21 (Charter/Party)	5/1/20-9/14/20 and 10/1/20-3/31/21 (Private) 5/1/20-9/7/20 and 10/8/20-3/31/21 (Charter/Party)	Revised sub-ACL to 37.5% of ABC with 7% management uncertainty buffer applied
2021	193	146.2	75.8	21	1	9/15/21-9/30/21 and 4/1/22-4/14/22 (Private) 9/8/21-10/7/21 and 4/1/22-4/14/22 (Charter/Party)	5/1/21-9/14/21 and 10/1/21-3/31/22 (Private) 5/1/21-9/7/21 and 10/8/21-3/31/22 (Charter/Party)	
2022	192	165.7	86.2	22	1	9/1/22-10/7/22 and 4/1/23-4/14/23	5/1/22-8/31/22, 10/8/22-3/31/23 and 4/15/23-4/30/23	Final rule effective 8/30/22
2023	192	170.4	88.7	22	1	9/1/23-10/31/23	11/1/23-4/30/24	Final rule effective 8/14/23

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
2024	192			23	1	9/1/24-10/31/24	11/1/24-4/30/25	An increase in the minimum fish size from 22” to 23”. Final rule effective August 14, 2023.

Table 55 – Summary of Gulf of Maine haddock recreational catch performance and federal management (fishing years 2010 – 2023).

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
2010	324	297.4	91.8	18	no limit		n/a	First year of sub-ACL 27.5% of ABC with 7% management uncertainty buffer applied Groundfish Regulations: Only one line per angler, and Fillets landed by private recreational and charter/party vessels must have at least 2 sq. inches (5.08 sq. cm) of contiguous skin that allows for the ready identification of the fish species. Such fillets are required to be from legal-sized fish, but the fillets themselves would not need to meet the minimum size requirements in the regulations.
2011	308			18	no limit	5/1/11 to 1/5/12	n/a	First Year: Gulf of Maine (Whaleback) Cod Spawning Protection Area: From April 1 through June 30 of each year, all recreational vessels, including private recreational and charter/party vessels, may only use pelagic hook-and-line gear, as defined below, when fishing in the Whaleback Cod Spawning Protection Area.[1]
				19	9	1/6/12 to 4/19/12	n/a	Accountability Measure (AM) for 2010 overage

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
		238.5	77.4	18	no limit	4/20/12 to 4/30/12	n/a	AM lifted after re-evaluation of data showing no 2010 overage
2012	259	280.7	108.4	18	no limit		n/a	
2013	74	231.5	312.2	21	no limit		n/a	
2014	173	658.6	380.7	21	3	5/1/14 to 8/31/14 and 11/1/14 to 2/28/15	9/1/14 to 10/31/14 and 3/1/15 to 4/30/15	*See Cod interim action*
2015	372	381.9	102.7	17	3	5/1/15 to 8/31/15 and 11/1/15 to 2/29/16	9/1/15 to 10/31/15 and 3/1/16 to 4/30/16	
2016	928	887.0	95.6	17	15	5/1/16 to 2/28/17 and 4/15/17 to 4/30/17	3/1/17 to 4/14/17	
2017	1,160			17	15	5/1/17 to 2/28/18 and	3/1/18 to 4/14/18	Replaced by final rule effective 7/27/17

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
						4/15/18 to 4/30/18		
		795.0	68.5	17	12	5/1/17 to 9/16/17 and 11/1/17 to 2/28/18 and 4/15/18 to 4/30/18	9/17/17 to 10/31/17 and 3/1/18 to 4/14/18	
2018	3,358	595.0	17.7	17	12	5/1/18 to 9/16/18 and 11/1/18 to 2/28/19 and 4/15/19 to 4/30/19	9/17/18 to 10/31/18 and 3/1/19 to 4/14/19	First Year: Winter Massachusetts Bay Spawning Protection Area: From November 1 through January 31 of each year, all recreational vessels, including private recreational and charter/party vessels, may only use pelagic hook-and-line gear, as defined below, when fishing in the Winter Massachusetts Bay Spawning Protection Area.[1]
2019	3,194	423.2	13.3	17	15	5/1/19 to 2/29/20 and 4/15/20 to 4/30/20	3/1/20 to 4/14/20	Previous year's regulations were in effect until July 5, 2019, when these measures were implemented. The possession limit increased from 12-15 fish, and the fall closure has been

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
								removed to increase access to this healthy stock.
2020	6,210	1202.3	19.4	17	15	5/1/20-2/28/21 and 4/1/21-4/30/21	3/1/21-3/31/21	Revised sub-ACL to 33.9% of ABC with 7% management uncertainty buffer applied
2021	5,295	901.5	17.0	17	15	5/1/21-2/28/22 and 4/1/22-4/30/22	3/1/22-3/31/22	
2022	3,634	477.2	13.1	17	20	5/1/22-2/28/23 and 4/1/23-4/30/23	3/1/23-3/31/23	An increase in the bag limit from 15 fish to 20 fish became effective August 30, 2022.
2023	FW 65: 610 Emergency Action: 793	474.3	59.8	For hire: 18 Private: 17	For hire: 15 Private: 10	5/1/23-2/28/24 and 4/1/24-4/30/24	3/1/24-3/31/24	The Council proposed an 18-inch minimum size and 15 fish limit for both the for-hire and private angler sector. NMFS implemented split measures out of concerns that an 18-inch minimum would unnecessarily constrain catch and increase dead discards in the private angler sector. This rule became effective August 14, 2023.
2024	759			18	15	5/1/24-2/28/25	3/1/25-3/31/25	These changes make the measures the same for all recreational vessels, rather

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
						and 4/1/25-4/30/25		than having different bag limits and minimum fish sizes for private vessels and for-hire vessels. This rule became effective July 24, 2024.

5.7.10.2.2 Southern New England Cod Recreational Effort and Catch

Table 56 provides a breakdown of the number of vessels active in the for-hire component of the recreational fishery for FY2019 to FY2023.

Table 56 – For-hire recreational vessels catching cod from Southern New England.

Fishing Year	Party	Charter	Total*
2019	36	61	90
2020	42	70	106
2021	46	72	109
2022	48	67	111
2023	48	53	97

Notes: *Total may not sum due to vessels taking both categories of trips during the fishing year. Based on vessel reporting via vessel log book.
Vessels landing or discarding cod from Southern New England statistical areas based on vessel log book.
Source: NMFS Greater Atlantic Regional Fisheries Office VTR database, November 2024.

“Old Georges Bank Cod” Recreational Catch Target

Framework 57 established a regulatory process for the Regional Administrator to adjust recreational measures to prevent the recreational catch target from being exceeded for fishing years 2018 and 2019. Framework 63 modifies the process to apply to fishing years 2023 and 2024, to prevent future overages of the GB cod ACL. An overview of the management history is provided for GB cod in Table 57.

Table 57 – Summary of changes in federal recreational management measures for GB cod.

Fishing Year	Catch target	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed
2018	138	23	10	All year	NA
2019	138	21	10	All year	NA
2020	138	21	10	All year	NA
2021	138	21	10	All year	NA
2022	75	Slot limit: 22 - 28	5	8/1/2022-4/30/2023	5/1/2022-7/31/2022
2023	113	23	5	5/1/2023-5/31/2023 and 9/1/2023-4/30/2024	6/1/2023-8/31/2023
2024	113	23	5	5/1/2024-5/31/2024 and 9/1/2024-4/30/2025	6/1/2024-8/31/2024
2025	NA	NA	0	NA	All Year

Table 58 summarizes recent catches by the recreational fishery formerly considered as the Georges Bank stock, which is now the Southern New England stock under the revised cod stock structure. Table 59 summarizes recent catches by the commercial fishery of SNE cod.

Table 58 – Summary of recent recreational catch (mt) for "old Georges Bank cod", FY2019 – FY2023.

	Recreational Fishery – "Old Georges Bank Cod"		
Fishing Year	Federal Waters Recreational Catch	State Waters Recreational Catch	All Recreational Catch
2019	88.9	11.0	99.9
2020	152.6	141.8	294.4
2021	191.8	44.2	236.0
2022	128.3	28.8	157.1
2023	206.9	81.3	288.2
Average	153.7	61.4	215.1

Sources: FY2019 – FY2023 final year-end multispecies catch reports, GARFO.

Table 59- Summary of recent commercial catch (mt) of SNE cod, FY2019-FY2023.

Fishing Year	Commercial Groundfish Fishery Catch (mt)	Other Commercial Sub-components Catch (mt)	State Commercial Sub-components Catch (mt)	Total Commercial Catch (mt)
2019	4.6	2.5	3.2	10.3
2020	5.7	1.6	5.8	13.1
2021	2.3	2.2	4	8.4
2022	3.7	2.4	3.4	9.4
2023	4.8	1.5	1.9	8.1
Average	4.2	1.9	3.8	9.9

Source: CAMS data. Accessed October 2024

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

6.1 INTRODUCTION

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.

6.1.1 Evaluation Criteria

This action evaluates the potential impacts of alternatives using the criteria in Table 60.

Table 60 – General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).

<table>
<tr><th rowspan="2">VEC</th><th rowspan="2">Resource Condition</th><th colspan="3">Impact of Action</th></tr>
<tr><th>Positive (+)</th><th>Negative (-)</th><th>No Impact (0)</th></tr>
<tr><td>Target and Non-target Species</td><td>Overfished status defined by the MSA</td><td>Alternatives that would maintain or are projected to result in a stock status above an overfished condition*</td><td>Alternatives that would maintain or are projected to result in a stock status below an overfished condition*</td><td>Alternatives that do not impact stock / populations</td></tr>
<tr><td>ESA-listed Protected Species (endangered or threatened)</td><td>Populations at risk of extinction (endangered) or endangerment (threatened)</td><td>Alternatives that contain specific measures to ensure no interactions with protected species (e.g., no take)</td><td>Alternatives that result in interactions/take of listed resources, including actions that reduce interactions</td><td>Alternatives that do not impact ESA listed species</td></tr>
<tr><td>MMPA Protected Species (not also ESA listed)</td><td>Stock health may vary but populations remain impacted</td><td>Alternatives that will maintain takes below PBR and approaching the Zero Mortality Rate Goal</td><td>Alternatives that result in interactions with/take of marine mammal species that could result in takes above PBR</td><td>Alternatives that do not impact MMPA Protected Species</td></tr>
<tr><td>Physical Environment / Habitat / EFH</td><td>Many habitats degraded from historical effort (see condition of the resources table for details)</td><td>Alternatives that improve the quality or quantity of habitat</td><td>Alternatives that degrade the quality, quantity or increase disturbance of habitat</td><td>Alternatives that do not impact habitat quality</td></tr>
<tr><td>Human Communities (Social and Economic)</td><td>Highly variable but generally stable in recent years (see condition of the resources table for details)</td><td>Alternatives that increase revenue and social well-being of fishermen and/or communities</td><td>Alternatives that decrease revenue and social well-being of fishermen and/or communities</td><td>Alternatives that do not impact revenue and social well-being of fishermen and/or communities</td></tr>
<tr><th colspan="5">Impact Qualifiers</th></tr>
<tr><td rowspan="6">A range of impact qualifiers is used to indicate any existing uncertainty</td><td colspan="2">Negligible</td><td colspan="2">To such a small degree to be indistinguishable from no impact</td></tr>
<tr><td colspan="2">Slight (sl) as in slight positive or slight negative</td><td colspan="2">To a lesser degree / minor</td></tr>
<tr><td colspan="2">Moderately (M) positive or negative</td><td colspan="2">To an average degree (i.e., more than “slight”, but not “high”)</td></tr>
<tr><td colspan="2">High (H), as in high positive or high negative</td><td colspan="2">To a substantial degree (not significant unless stated)</td></tr>
<tr><td colspan="2">Significant (in the case of an EIS)</td><td colspan="2">Affecting the resource condition to a great degree.</td></tr>
<tr><td colspan="2">Likely</td><td colspan="2">Some degree of uncertainty associated with the impact</td></tr>
</table>

*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.

6.1.2 Approach to Impacts Analysis

The specific approach to impacts analysis is described under each of the VECs – regulated groundfish and other species (Section 6.2), essential fish habitat (Section 6.3) endangered and other protected species (Section 6.4), human communities – economic (Section 6.5), and human communities – social (Section 6.6). Cumulative effects analysis is also provided (Section 6.7). The Council's preferred alternatives and options are identified in the impacts sections.

6.2 IMPACTS ON REGULATED GROUNDFISH AND OTHER SPECIES – BIOLOGICAL

Biological impacts discussed below focus on expected changes in fishing mortality for regulated multispecies stocks. Changes in fishing mortality may result in changes in stock size. Impacts on essential fish habitat and endangered or threatened species are discussed in separate sections. Impacts are discussed in relation to impacts on regulated multispecies (groundfish) and other species. The impacts associated with the measures are anticipated to not be significant in comparison to the No Action alternatives. Throughout this section, impacts are often evaluated using an analytic technique that projects future stock size based on a recent age-based assessment. These projections are known to capture only part of the uncertainties that are associated with the assessment projections. There is evidence, in the case of multispecies stocks, that the projections tend to be overly optimistic when they extend beyond a short-term period (i.e., 1-3 years), although recent work suggests some improvements. This means, generally, that the projections tend to overestimate future stock sizes and underestimate future fishing mortality. These uncertainties in the projection methodology should be considered when reviewing impacts that use this tool. Long-term projections (greater than 3 years) should not be over-interpreted since they are imprecise and are often overly optimistic. The uncertainty estimates (90% confidence intervals on SSB) from the projections do not cover the true uncertainty in the population. For stocks in rebuilding plans, see the overview in the Affected Environment for additional information.

6.2.1 Action 1 – Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

6.2.1.1 Alternative 1 – No Action

Impacts on regulated groundfish

Alternative 1/No Action has no direct or indirect biological impacts on regulated groundfish. Impacts are determined from the implementing measures in Actions 2 – 5.

Impacts on other species

Alternative 1/No Action has no direct or indirect biological impacts on other species. Impacts are determined from the implementing measures in Actions 2 – 5.

6.2.1.2 Alternative 2 – Status Quo

Impacts on regulated groundfish

Alternative 2 has no direct or indirect biological impacts on regulated groundfish. Impacts are determined from the implementing measures in Actions 2 – 5.

Impacts on other species

Alternative 2 has no direct or indirect biological impacts on other species. Impacts are determined from the implementing measures in Actions 2 – 5.

6.2.1.3 Alternative 3 – Revise Atlantic Cod Stock Units in the FMP (*Preferred Alternative*)

Impacts on regulated groundfish

Alternative 3 has no direct or indirect biological impacts on regulated groundfish. Impacts are determined from the implementing measures in Actions 2 – 5.

Impacts on other species

Alternative 3 has no direct or indirect biological impacts on other species. Impacts are determined from the implementing measures in Actions 2 – 5.

6.2.2 **Action 2 – Atlantic Cod Status Determination Criteria**

Management track stock assessments were completed for the four new Atlantic cod stocks in June 2024. The assessments determined that two of the four cod stocks, Southern New England (SNE) and Western Gulf of Maine (WGOM), are overfished and experiencing overfishing, while the remaining two, Eastern Gulf of Maine (EGOM) and Georges Bank (GB), are overfished but are not experiencing overfishing (Table 6). The peer review accepted all four models of Atlantic cod with some minor revisions pertaining to data exclusions and projection configuration. The four new Atlantic cod stock units are being added to the FMP under this action.

6.2.2.1 Alternative 1 – No Action

Impacts on regulated groundfish

Under Alternative 1 (No Action), status determination criteria (SDCs) would not be adopted for the four new Atlantic cod stock units: GB Atlantic cod, EGOM Atlantic cod, WGOM Atlantic cod, and SNE Atlantic cod, which would be inconsistent with the guidelines for National Standard 1. Without SDCs for the new stocks, stock status cannot be determined. Stock status is used to derive overfishing limits (OFLs), acceptable biological catches (ABCs), and to ultimately set specifications for subsequent fishing years.

Alternative 1/No Action would not be expected to have direct or indirect impacts on groundfish species in the short-term. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. However, the four Atlantic cod stocks being added to the FMP through this action do not currently have SDCs specified. Without SDCs, there could not be a determination of stock status or estimated OFLs, ABCs, or ACLs. Over the long-term, impacts of Alternative 1/No Action would be negative, as biomass targets would not be based on the latest scientific information, increasing the risk of overfishing over the long-term. For these reasons, Alternative 1/No

Action would have neutral to negative impacts on regulated groundfish, including the four Atlantic cod stocks, and neutral to negative impacts when comparing Alternative 1/No Action to Alternative 2

Impacts on other species

Alternative 1/No Action would not be expected to have direct or indirect impacts on non-groundfish species such as monkfish, dogfish, skates, and Atlantic sea scallops. This measure establishes the criteria used to determine if overfishing is occurring, or the stock is overfished. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts on other species are neutral.

6.2.2.2 Alternative 2 – New Status Determination for Cod Stocks (*Preferred Alternative*)

Impacts on regulated groundfish

Alternative 2 would adopt new SDCs for the four Atlantic cod stock units: GB Atlantic cod, EGOM Atlantic cod, WGOM Atlantic cod, and SNE Atlantic cod (Table 3). Stock assessment results for the numerical values corresponding to the SDC definitions are provided in Table 4 and these numerical values would be updated in subsequent stock assessments. SDCs for the new cod stock units are necessary for determining stock status, which are then used to derive overfishing limits (OFLs), acceptable biological catches (ABCs), and to ultimately set specifications for subsequent fishing years.

Alternative 2 would not be expected to have direct or indirect impacts on groundfish species in the short term. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. However, the four Atlantic cod stocks being added to the FMP through this action do not currently have SDCs specified. Over the long term, impacts of Alternative 2 would be positive, since adopting SDCs for the four stocks according to the most recent assessments decreases the risk of overfishing over the long-term. For these reasons, Alternative 2 would have neutral to positive impacts on regulated groundfish, including the four Atlantic cod stocks, and when comparing Alternative 2 to Alternative 1/No Action, the likely impacts on regulated groundfish species are neutral to positive.

Impacts on other species

Alternative 2 would not be expected to have direct or indirect impacts on non-groundfish species such as monkfish, dogfish, skates, and Atlantic sea scallops. This measure is primarily administrative in that it establishes the criteria used to determine if overfishing is occurring or the stock is overfished. For these when comparing Alternative 2 to Alternative 1/No Action, the likely impacts on other species are neutral.

6.2.3 Action 3 – Revised Specifications for Atlantic Cod

6.2.3.1 Alternative 1 – No Action

Impacts on regulated groundfish

Under Alternative 1/No Action, the four Atlantic cod stocks (EGOM, WGOM, GB, and SNE) do not have FY2026 specifications. Given these are new stocks in the FMP, the four cod stocks do not have default specifications, and so there would be no specifications for the Atlantic cod stocks beginning May 1, 2026.

Under Alternative 1/No Action, because the four Atlantic cod stocks do not have FY2026 specifications, beginning May 1, 2026, commercial groundfish vessels would not be allowed to fish in all broad stock areas without these allocations of Atlantic cod. It is anticipated that Alternative 1/No Action would result in substantial changes in directed groundfish fishing effort for the 2026 fishing year. More specifically, beginning May 1, 2026, Alternative 1/No Action would be expected to halt commercial groundfish fishing effort in all broad stock areas. Without specification of an ACL for Atlantic cod, catch would not be allocated to the commercial groundfish fishery (sectors or common pool vessels), and targeted groundfish fishing activity would not occur for these stocks. Catches would not be eliminated because there would probably be incidental catches or bycatch from other fisheries. AMs in the multispecies fishery would be maintained but are expected to have a low probability of being triggered without allocations.

In addition to the lack of targeted groundfish fishing activity in all broad stock areas for Atlantic cod, certain provisions of the sector management system probably would constrain fishing even for stocks with an ACL within the fishing season. For example, current management measures require that a sector stop fishing in a stock area if it does not have ACE for a given stock. Fishing can continue on stocks for which the sector continues to have ACE, but only if the sector can demonstrate it will not catch the ACE-limited stock. In most cases, this provision results in little opportunity for sector vessels to fish on stocks that have an ACL under Alternative 1/No Action, and so most commercial groundfish fishing activity would not occur.

The lack of specifications for the four Atlantic cod stocks for the 2026 fishing year would mean fishing on groundfish trips would stop and biological impacts on regulated groundfish species would decline for stocks managed or located in each broad stock area. In general, Alternative 1/No Action would be expected to result in positive impacts on managed stocks. Given there are no FY2026 specifications for the four Atlantic cod stocks under Alternative 1/No Action, directed groundfish fishing would not occur. For these reasons, Alternative 1/No Action would have positive impacts on regulated groundfish compared to Alternative 2. However, OFLs and ABCs under Alternative 1/No Action would not reflect the most recent science.

Impacts on other species

Alternative 1/No Action is expected to have positive indirect effects on non-groundfish species such as monkfish, dogfish, skates, and Atlantic sea scallops that are captured incidentally during groundfish trips. Indirect effects are generally likely to be beneficial given the expected reduced groundfish fishing activity. Catches of other species that occur on groundfish trips would decline as a result. There are only limited opportunities for groundfish vessels to target other stocks in other fisheries, so the shifting of effort into other fisheries is not likely to occur on a large scale. These other fisheries will also have ACLs and AMs so while such effort shifts may have economic effects, the biological impacts should not be negative. Considering the differences between the ACLs of Alternative 1/No Action and Alternative 2, the fishing mortality on other stocks that are caught incidentally during groundfish trips would probably be lower under Alternative 1/No Action.

6.2.3.2 Alternative 2 – Revised Specifications (*Preferred Alternative*)

Impacts on regulated groundfish

Alternative 2 would reflect the results of the 2024 management track assessments. Alternative 2 would adopt new ABCs that are consistent with the most recent science. Details on the SSC's recommendations are located in Appendix I. For stocks in formal rebuilding plans, a summary is provided in the Affected Environment (see Section 5.2.21). This summary incorporates the assessment results from the most recent stock assessments in 2024, as appropriate.

The four Atlantic cod stocks of EGOM, WGOM, GB, and SNE are being added to the FMP for FY2026 through this action and so do not have comparative FY2025 ACLs.

Considering the differences between the ACLs of Alternative 1/No Action and Alternative 2, and that under Alternative 1/No Action commercial groundfish fishing would halt on May 1, 2026 without specifications for the four Atlantic cod stocks, the overall fishing mortality on regulated groundfish stocks would likely be higher under Alternative 2. Therefore, biological impacts on regulated groundfish would be negative, relative to Alternative 1/No Action.

However, there is some added benefit under Alternative 2 as it pertains to setting specifications for the four new Atlantic cod stocks. Managing to the OFLs and ABCs of the newly recognized four cod stocks will allow for more efficient rebuilding of the population since both the existing cod stocks (GOM and GB) were already in rebuilding plans and is expected to prevent any further overfishing. Additionally, recognizing the new stock structure over the long-term could help prevent loss of spawning populations and balance fishing mortality across biological populations. It could also allow stock-specific management measures that facilitate recovery of depleted stocks and strengthen their resilience (McBride and Smedbol 2022).

Revised specifications are determined according to updated stock assessments. These updated OFLs and ABCs are anticipated to prevent overfishing and increase the probability of rebuilding. A summary of the SSC recommendations by stock is located in Appendix I. Given that the updated OFLs and ABCs are based on the most recent science, the anticipated impact would be positive.

EGOM cod – The FY2026 ABC at 75% F_{MSY} is unlikely to result in overfishing for this stock.

Table 61 – Projection results for EGOM cod (FMSY proxy = 0.27 and SSBMSY = 2,184 mt).

Year	OFL	ABC	F	SSB	Probability of overfishing
2026	50	39	0.203	196	0.099
2027	39	30	0.203	153	0.146

WGOM cod – The FY2026 ABC at 75% F_{MSY} is unlikely to result in overfishing for this stock.

Table 62 – Projection results for WGOM cod (FMSY proxy = 0.19 and SSBMSY = 62,677 mt).

Year	OFL	ABC	F	SSB	Probability of overfishing
2026	603	460	0.14	2,641	0.346
2027	769	586	0.14	3,432	0.373

GB cod – The SSC recommended setting the FY2026-FY2027 ABC at 75% F_{MSY} which is unlikely to result in overfishing for this stock. However, GB cod includes a transboundary management unit which is jointly managed with Canada. The revised specifications for GB cod for FY2026 (Table 7) are intended to serve as a placeholder, until they can be replaced by future specifications. The U.S./Canada TACs were set for FY2025 only, to be revisited this year, which TMGC could consider updated Canadian stock assessment information for GB cod, as well as the SSC recommendations for FY2026 and FY2027 (see Appendix I). However, the TMGC meeting is scheduled to occur in October 2025, and therefore FY2026 TMGC recommendations and U.S./Canada TACs are not available. The placeholder specifications use the FY2026 total ABC, as recommended by the SSC in July 2024 (see Appendix I), as the U.S./Canada shared TAC and apply the 2026 country shares (68% Canada / 32% U.S). This results in a total ABC of 331 mt and a U.S. ABC of 106 mt.

Table 63 – Projection results for GB cod (FMSY proxy = 0.233 and SSBMSY = 8,290 mt).

Year	OFL	ABC	F	SSB	Probability of overfishing
2026	433	331	0.175	1,731	

SNE cod – The SSC recommended setting the ABCs at 75% F_{MSY}, with a slight modification to hold the 2026 ABC constant during 2027. The SSC included this additional precaution to address the uncertainties associated with recreational fishery data. Recreational catch estimates are considered to have greater uncertainty than commercial landings and the harvest for SNE cod is primarily recreational. The SSC acknowledged that these ABCs will lead to significant reductions from previous harvest levels in the SNE statistical reporting areas. The recommended ABC is unlikely to result in overfishing for this stock.

Table 64 – Projection results for SNE cod (FMSY proxy = 0.121 and SSBMSY = 11,258 mt).

Year	OFL	ABC	F	SSB	Probability of overfishing
2026	47	36	0.09	328	0.364
2027	65	36	0.09	483	0.225

6.2.3.3 Alternative 3 – Southern New England Cod Recreational Sub-ACL (*Preferred Alternative*)

6.2.3.3.1 Option 1 – No Action

<u>*Impacts on regulated groundfish*</u>

Option 1/No Action would not set a sub-ACL for the recreational fishery for SNE cod. Recreational catches of SNE cod would be attributed to state and other sub-components. As a result, the only sub-ACL for this stock would be for the commercial groundfish fishery, and only the commercial groundfish fishery would have an AM. However, the recreational fishery contributes to the majority of catches of SNE cod (see Table 58 and Table 59); under Option 1/No Action, this fishery component which accounts for most of the catch of this stock would not have an allocation or AMs. Option 1/No Action increases the risk that overfishing will occur for a longer period and that rebuilding progress could be hindered because the AM would not be applied to the recreational fishery component, and measures taken to control catches by the commercial groundfish fishery would only affect the lesser proportion of the total catch. Thus, the AMs under Option 1/No Action are unlikely to modify catches enough to end overfishing. When compared to Option 2, Option 1/No Action would have negative impacts on regulated groundfish, including SNE cod.

<u>*Impacts on other species*</u>

Option 1/No Action would not have direct biological impacts on other species.

6.2.3.3.2 Option 2 – Set Southern New England Cod Recreational Sub-ACL (*Preferred Option*)

<u>*Impacts on regulated groundfish*</u>

Option 2 would set a sub-ACL for the recreational fishery for SNE cod. The recreational fishery contributes to the majority of catch of SNE cod (see Table 58 and Table 59); setting an allocation and AMs for the fishery component that accounts for the majority of catches would be expected to result in more control over catch for this stock. This would be expected to contribute towards rebuilding progress and reducing the risk of overfishing. Option 2 would have positive impacts on regulated groundfish, including SNE cod, compared to Option 1/No Action.

Impacts on other species

Option 2 would not have direct biological impacts on other species.

6.2.4 **Action 4 – Commercial Fishery Management Measures – Atlantic Cod**

6.2.4.1 Alternative 1 – Common Pool Accountability Measures for Cod Stocks (*Preferred Alternative*)

6.2.4.1.1 **Option 1 – No Action**

Impacts on regulated groundfish

Option 1/No Action would have neutral to negative impacts on regulated groundfish, including the four Atlantic cod stocks. Without common pool accountability measures that reflect the four new cod stock units, there is an increased risk of common pool catches exceeding sub-ACLs. When compared to Options 2 and 3, Option 1/No Action could have negative impacts on regulated groundfish.

Impacts on other species

Option 1/No Action is expected to have neutral impacts on other species.

6.2.4.1.2 **Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closures Areas for Cod Stocks (*Preferred Option*)**

Impacts on regulated groundfish

Option 2 would have positive impacts on regulated groundfish, including the four Atlantic cod stocks. Trimester TAC measures are intended to keep common pool catches within the trimester TACs and sub-ACLs. Option 2 would have positive impacts compared to Option 1/No Action, and neutral impacts compared to Option 3, as the trimester TAC measures and trip limits work together to keep catches within trimester TACs and sub-ACLs for the common pool.

Impacts on other species

Option 2 would have neutral impacts on the other species.

6.2.4.1.3 **Option 3 – Common Pool Baseline Trip Limits for Cod Stocks (*Preferred Option*)**

Impacts on regulated groundfish

Option 3 would have positive impacts on regulated groundfish, including the four Atlantic cod stocks. Common pool trip limits are intended to keep common pool catches within the trimester TACs and sub-ACLs. Option 3 would have positive impacts compared to Option 1/No Action, and neutral impacts compared to Option 2, as the trimester TAC measures and trip limits work together to keep catches within trimester TACs and sub-ACLs for the common pool.

Impacts on other species

Option 3 would have neutral impacts on the other species.

6.2.5 **Action 5 - Recreational Fishery Management Measures – Atlantic Cod**

6.2.5.1 Alternative 1 – Recreational Fishing Measures for Southern New England Cod (*Preferred Alternative*)

6.2.5.1.1 **Option 1 – No Action**

Impacts on regulated groundfish

Option 1/No Action is expected to have negative impacts on regulated groundfish, including SNE cod. Under Option 1/No Action, there would be no possession limits for SNE cod, other than a minimum fish size restriction of 23 inches for cod outside the GOM stock area. Continuing to allow possession of SNE cod would have negative impacts on the stock and would hinder stock rebuilding. Recent average catches by the recreational fishery under the recreational measures in place (Table 57) exceed the FY2026 ABC by almost tenfold (Table 58). Compared to Option 2, Option 1/No Action would have negative impacts on SNE cod.

Impacts on other species

Option 1/No Action would have neutral impacts on other species. It is possible that impacts would be slight negative compared to Option 2, however neither option directly impacts management of other species.

6.2.5.1.2 **Option 2 – Recreational Fishing Measures for Southern New England Cod (*Preferred Option*)**

Impacts on regulated groundfish

Overall, Option 2 is expected to have positive impacts on regulated groundfish, including SNE cod. Recreational measures are intended to reduce recreational fishing mortality and promote stock rebuilding of SNE cod. Given the magnitude in difference between the FY2026 ABC and recent recreational catches (Table 58), zero possession for recreational fishermen (private angler and party/charter operators) is intended to reduce recreational mortality to levels that end overfishing and promote stock rebuilding.

Approximately 80% of SNE cod recreational mortality generally occurs in Federal waters (see Appendix IV). There is an unknown level of noncompliance that could occur in federal waters under no possession, particularly if measures in state waters do not adopt zero possession. Even marginal differences in state and federal regulations may increase noncompliance which could further reduce the conservation benefit of no possession.

It is possible that Option 2 may deter targeted fishing for cod in SNE in federal waters. If anglers are able to adjust their behavior and move to areas with lower concentrations of SNE cod, fishing mortality would be reduced. If that occurs, Option 2 would be expected to have positive impacts on SNE cod when compared with Option 1/No Action. Likewise, if anglers avoid SNE cod, Option 2 could have slight positive impacts on other regulated groundfish species co-caught with SNE cod when compared to Option 1/No Action. However, there are not as many other regulated groundfish species available to anglers fishing in SNE as in other areas.

Under Option 2, there is a potential loss of information on SNE cod for the stock assessment, given the majority of catches reported and used within the assessment are from the recreational fishery, and zero possession could increase uncertainty of catch estimates. There has been a lack of biological data collected in the recreational fishery, and recent efforts to collect biological data on recreational catches could be hampered by zero possession. Increases in the discards could result in higher uncertainty with the removals and potentially degrade the stock assessment and knowledge with regard to potential changes in future stock status. However, the impacts on the assessment from zero possession are uncertain, especially given the generally high uncertainty with the recreational catches in SNE.

Impacts on other species

Option 2 would have neutral impacts on other species. It is possible Option 2 could result in slight positive impacts for species co-caught with SNE cod when compared to Option 1/No Action. However, it is also possible that anglers could switch to targeting other species in SNE under zero possession for cod. Overall, Option 2 would not directly affect the management of other species in SNE.

6.2.5.2 Alternative 2 - Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks (*Preferred Alternative*)

6.2.5.2.1 Option 1 – No Action

Impacts on regulated groundfish

Option 1/No Action would likely have neutral to positive impacts on regulated groundfish. Option 1/No Action would maintain the regulatory process for the Regional Administrator to adjust recreational measures for stocks with recreational sub-ACLs (WGOM cod, GOM haddock, and SNE cod (proposed under Action 3 Alternative 3)), and this regulatory process would not extend to EGOM cod and GB cod. This measure is largely administrative, though the recreational measures that could extend from this regulatory process would continue to have positive impacts to regulated groundfish.

Impacts on other species

Option 1/No Action would not be expected to have any direct biological impact on other species.

6.2.5.2.2 Option 2 - Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod (*Preferred Option*)

Impacts on regulated groundfish

Option 2 would allow for recreational management measures for EGOM cod and GB cod to be adjusted in FY2026 by the Regional Administrator, in addition to stocks with recreational sub-ACLs (WGOM cod, GOM haddock, and SNE cod (proposed under Action 3/Alternative 3)). Option 2 would likely have neutral to positive impacts on regulated groundfish and would likely lead to positive impacts relative to Alternative 1/No Action for regulated groundfish species, mainly EGOM cod and GB cod. This measure is largely administrative, though the recreational measures that could extend from this regulatory process could have positive impacts for regulated groundfish, including EGOM cod and GB cod. The intent is to consider applying the same recreational measures for WGOM cod, which will be developed in consultation with the Council and NMFS, to the EGOM and GB stock areas, if appropriate.

Impacts on other species

Option 2 would not be expected to have any direct biological impact on other species.

6.3 Impacts on Physical Environment and Essential Fish Habitat

The Essential Fish Habitat (EFH) impacts discussion below focuses on changes in the amount or location of fishing that might result from the implementation of the various alternatives. This approach to evaluating adverse effects to EFH is based on two principles: (1) seabed habitat vulnerability to fishing effects varies spatially, due to variations in seabed substrates, energy regimes, living and non-living seabed structural features, etc., between areas and (2) the magnitude of habitat impacts is based on the amount of time that fishing gear spends in contact with the seabed. This seabed area swept (seabed contact time) is grossly related to the amount of time spent fishing, although it will of course vary depending on catch efficiency, gear type used, and other factors.

The area that is potentially affected by the proposed alternatives includes EFH for species managed under the following Fishery Management Plans: NE Multispecies; Atlantic Sea Scallop; Monkfish; Atlantic Herring; Summer Flounder, Scup and Black Sea Bass; Atlantic Mackerel, Squid, and Butterfish; Spiny Dogfish; Tilefish; Deep-Sea Red Crab; Atlantic Surfclam and Ocean Quahog; Atlantic Bluefish; Northeast Skates; and Atlantic Highly Migratory Species.

6.3.1 Action 1 - Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

Action 1 encompasses incorporating the revised Atlantic cod stock units into the FMP.

6.3.1.1 Alternative 1 – No Action

Alternative 1/No Action has no direct or indirect impacts on physical habitats and EFH. Impacts are determined from the implementing measures in Actions 2 – 5.

6.3.1.2 Alternative 2 – Status Quo

Alternative 2 has no direct or indirect impacts on physical habitats and EFH. Impacts are determined from the implementing measures in Actions 2 – 5.

6.3.1.3 Alternative 3 – Revised Atlantic Cod Stock Units in the FMP (*Preferred Alternative*)

Alternative 3 has no direct or indirect impacts on physical habitats and EFH. Impacts are determined from the implementing measures in Actions 2 – 5.

6.3.2 Action 2 – Atlantic Cod Status Determination Criteria

Action 2 encompasses status determination criteria (SDCs) for the four revised Atlantic cod stocks.

6.3.2.1 Alternative 1 – No Action

Under Alternative 1/No Action, no SDCs would be adopted for the new cod stock units. As Alternative 1/No Action is an administrative measure, it will have no direct impact on physical habitats and EFH because it does not, in and of itself, change fishing effort or behavior. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts to habitat are negligible.

6.3.2.2 Alternative 2 – New Status Determination for Cod Stocks (*Preferred Alternative*)

Under Alternative 2, new SDCs would be adopted for the revised Atlantic cod stock units, as specified in Table 2 and Table 3. Like Alternative 1, Alternative 2 is also an administrative measure, which does not, in and of itself, change fishing effort or behavior. Therefore, it will have no direct impacts to physical habitat and EFH. Comparing Alternative 2 to Alternative 1/No Action, the likely impacts to habitat are negligible

6.3.3 Action 3 – Revised Specifications for Atlantic Cod

Action 3 encompasses adjustments to ACLs for the four Atlantic cod stocks (Alternative 2) and establishment of a recreational sub-ACL for SNE cod (Alternative 3). Multiple fisheries are affected by these specifications. Those fisheries that have negative impacts to habitat include the sector and common pool commercial groundfish fishery, which uses a combination of bottom trawls and fixed gears. Large changes in commercial groundfishing are anticipated under Action 3. Other fisheries influenced by these specifications include the recreational groundfish fishery, prosecuted with hook and line, which has negligible impacts to habitat and EFH. Thus, the discussion below focuses on changes in effort among commercial groundfish vessels and the resultant impacts to EFH.

6.3.3.1 Alternative 1 – No Action

Under Alternative 1/No Action, there would be no updates to specifications for FY2026 relative to the default measures. The four Atlantic cod stocks (EGOM, WGOM, GB, and SNE) have no default specifications because they are being added to the FMP through this action.

Because the four Atlantic cod stocks do not have FY2026 specifications under this alternative, beginning on May 1, 2026, there would be an expected halt to commercial groundfish fishing effort in all broad stock areas. Thus, commercial groundfish fishing effort and behavior under Alternative 1/No Action is expected to be substantially lower than current operating conditions, which would result in positive impacts to habitat and EFH relative to current conditions and compared to Alternative 2.

6.3.3.2 Alternative 2 – Revised Specifications (*Preferred Alternative*)

Alternative 2 includes specifications for the four Atlantic cod stocks. The ACLs under Alternative 2 are higher for the four Atlantic cod stocks, given these stocks do not have ACLs specified under Alternative 1/No Action.

Annual catch limits can be considered a proxy for relative fishing effort (e.g., amount of gear set or towed, gear soak or tow duration, number of trips, number of vessels) and behavior (e.g., area fished). As information on fishing effort and behavior informs the magnitude of impacts to habitat, changes in ACLs can be used to estimate changes in impacts, with lower catch limits resulting in less effort and fewer impacts. As Alternative 2 will result in an increase in the ACL for the four Atlantic cod stocks, some increase in effort is possible under Alternative 2; however, any potential increase in effort is expected to be tempered by constraining stocks that are spread out across broad stock areas (see Economic Impacts, Section 6.5.3.2). In particular, collectively across the Atlantic cod stocks there is a decrease in ACLs relative to FY2024 (see Table 67 in Economic Impacts, Section 6.5.3.2). WGOM cod is predicted to be the most constraining stock (see Economic Impacts, Section 6.5.3.2), and the majority of landings and revenue occur on groundfish trips within the WGOM cod stock area (see Table 31).

With respect to cod management transition, behavioral changes in the fishery may occur due to the transition from two cod stocks to four for FY2026, which could result in changes in effort relative to current operating conditions. For example, as noted in the Economic Impacts (Section 6.5.3.2), few trips occurred in the EGOM cod broadstock area during FY2023. With separate WGOM and EGOM cod quotas in FY2026, and the WGOM quota predicted to be highly constraining, there may be a shift in effort to EGOM. This would be expected to potentially occur for vessels fishing in the northern portion of the WGOM near the EGOM stock boundary. Given economic considerations (e.g., fuel costs) and vessel operational limitations particularly for smaller size-class vessels, it is not anticipated that vessels would shift effort substantially from where their fishing activity currently takes place, for the WGOM stock area and across all cod stock areas. Given the predicted constraining nature of several groundfish stocks, including WGOM cod and GB cod, some vessels could choose not to fish if they do not have available ACE or if ACE lease prices become substantially higher. Vessels may also opt to reduce the amount of gear set or set gear for shorter durations in an effort to avoid the constraining cod stocks.

Based on this, and the fact that the proposed specifications under Alternative 2 are no greater than or are within the range of the specifications that have been authorized by the fishery over the last five or more years, resultant fishing behavior and effort in the groundfish fishery is expected to remain similar to what has been observed in the fishery over this timeframe or potentially decrease. Specifically, the amount of gear (hook and line, bottom trawls and gillnets), tow or soak durations, and areas fished are not expected to change significantly from current operating conditions and could in fact decrease, and is likely to result in slight positive impacts to habitats and EFH, relative to current conditions. Relative to Alternative 1/No Action, which will effectively shut down the commercial groundfish fishery, Alternative 2 is likely to result in slight negative impacts to habitats and EFH.

6.3.3.3 Alternative 3 – Southern New England Cod Recreational Sub-ACL (*Preferred Alternative*)

Alternative 3 sets a recreational sub-ACL for the newly established Southern New England cod stock. The recreational fishery is prosecuted with hook and line gear, which has negligible impacts to habitat and EFH. Therefore, no direct impacts on EFH are anticipated to result from either Option 1 (No Action, no sub-ACL established) or Option 2 (establishes a sub-ACL).

6.3.4 Action 4 – Commercial Fishery Management Measures – Atlantic Cod

Action 5 sets measures related to harvest of the common pool trimester TAC across the four revised Atlantic cod stocks.

6.3.4.1 Alternative 1 – Common Pool Accountability Measures for Cod Stocks (*Preferred Alternative*)

6.3.4.1.1 Option 1 – No Action

Under Option 1, no trimester TACs or DAS/trip-level possession limits are specified for the revised stocks. Common pool fishing would continue under Option 1, but common pool closures could be more likely if management is not structured to match the updated stock configuration. Because the common pool fishery represents a small fraction of groundfish effort (approximately 1% of landings), the overall impacts to habitat from not setting trimester TACs or possession limits for the new stocks are expected to be negligible.

6.3.4.1.2 Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closures Areas for Cod Stocks (*Preferred Option*)

Option 2 allocates quota to the common pool fishery by trimester via stock-specific trigger percentages. If the trigger percentages are estimated to be caught, specific statistical areas close to all common pool gear types for the remainder of that trimester. These TAC apportionments may have a substantial effect on common pool fishing operations, particularly in stock areas with high cod utilization (i.e., the WGOM unit). However, the common pool fishery represents a small fraction of groundfish effort (approximately

1% of landings), such that overall impacts to habitat associated with this TAC apportionment approach are negligible.

6.3.4.1.3 Option 3 – Common Pool Baseline Trip Limits for Cod Stocks (*Preferred Option*)

Option 3 sets trip limits at the DAS and trip level for each of the four cod stocks / statistical fishing areas. These trip limits are intended to reduce the chance of common pool closures in each stock area before the trimester concludes. In locations with higher common pool participation (WGOM and EGOM), limits are similar to prior years. The GB stock, which has very little common pool effort, has lower limits than in past years, and possession limits for SNE are set to zero. There are likely to be some effects on common pool fishing activity as a result of these trip limits, but since the fishery represents only a small percentage of groundfish effort, the resultant impacts to EFH are expected to be negligible.

6.3.5 Action 5 - Recreational Fishery Management Measures – Atlantic Cod

Action 6 would adjust recreational harvest measures for Atlantic cod, given the revised cod stock structure.

6.3.5.1 Alternative 1 – Recreational Fishing Measures for Southern New England Cod (*Preferred Alternative*)

Alternative 1 considers cod possession limits for recreational fishing. Option 1 does not set a limit, and the minimum size would remain at 23 inches when fishing outside the GOM regulated mesh area, including in Southern New England. Option 2, which is preferred, sets the SNE recreational cod possession limit to zero. Option 2 is likely to decrease recreational fishing activity in SNE relative to Option 1, however, the recreational fishery which is prosecuted using hook and line gear has negligible impacts on EFH. Thus, the impacts of Options 1 and 2 on habitat are negligible, and very similar to one another.

6.3.5.2 Alternative 2 - Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks (*Preferred Alternative*)

Alternative 2 considers whether to establish a regulatory process for the Regional Administrator to set recreational measures for stocks without sub-ACLs (EGOM and GB). Under Option 1, the Regional Administrator's authority would only cover recreational measures for the WGOM and SNE stocks. Under Option 2, which is preferred, the Regional Administrator could set measures for the EGOM and GB stocks as well. Establishing the regulatory process for the Regional Administrator to adjust recreational fishing measures is an administrative measure and will have no direct impact on EFH. Further, the recreational fishery which is prosecuted using hook and line gear has negligible impacts on EFH. Thus, the impacts of Options 1 and 2 on habitat are negligible, and very similar to one another.

6.4 IMPACTS ON ENDANGERED AND PROTECTED SPECIES

The Amendment 25 alternatives are evaluated for their impacts on species protected under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972. The current conditions of the protected species VEC is summarized in Table 14 and described in more detail in Section 5.6. Impacts to protected species are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high) based on the guidelines shown in Table 70; this is informed by information provided in Section 5.6.

By definition, all ESA-listed species are in poor condition and any take can negatively impact that species' recovery. As a result, for ESA-listed species, any action that results in interactions or take is expected to have some level of negative impacts; even actions that reduce interactions will have a level of negative impacts unless those actions reduce interactions to zero. Actions expected to result in positive impacts on ESA-listed species include only those that contain specific measures to ensure no interactions (i.e., no take).

For marine mammals protected under the MMPA, but not listed under the ESA, the stock condition varies by species; however, all are in need of protection. Specifically, there are MMPA protected species in good condition (i.e., marine mammal stocks whose potential biological removal (PBR) level have not been exceeded) and in poor condition (i.e., marine mammal stocks that have exceeded or are near exceeding their PBR level). For marine mammal stocks that have reached or exceeded their PBR level, some level of negative impacts would be expected from alternatives that result in the potential for interactions between fisheries and those stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), alternatives not expected to change fishing behavior or effort relative to current operating conditions in the fishery may have some level of positive impacts by maintaining takes below the PBR level and approaching the zero mortality rate goal (Table 60).

6.4.1 Action 1 – Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

Action 1 encompasses incorporating the revised Atlantic cod stock units into the FMP.

6.4.1.1 Alternative 1 – No Action

Alternative 1/No Action has no direct or indirect impacts on protected species (ESA listed and MMPA protected). Impacts are determined from the implementing measures in Actions 2 – 5.

6.4.1.2 Alternative 2 – Status Quo

Alternative 2 has no direct or indirect impacts on protected species (ESA listed and MMPA protected). Impacts are determined from the implementing measures in Actions 2 – 5.

6.4.1.3 Alternative 3 – Revise Atlantic Cod Stock Units in the FMP (*Preferred Alternative*)

Alternative 3 has no direct or indirect impacts on protected species (ESA listed and MMPA protected). Impacts are determined from the implementing measures in Actions 2 – 5.

6.4.2 Action 2 – Atlantic Cod Status Determination Criteria

Action 2 encompasses status determination criteria (SDCs) for the four revised Atlantic cod stocks.

6.4.2.1 Alternative 1 – No Action

Under Alternative 1/No Action, there would be no SDCs established for the four Atlantic cod stocks (EGOM, WGOM, GB, and SNE). As Alternative 1/No Action is an administrative measure, it will have no direct impact on protected species (ESA listed and MMPA protected) because it does not, in and of itself, change fishing effort or behavior. For these reasons when comparing Alternative 1/No Action to Alternative 2, the likely impacts to protected species are negligible.

6.4.2.2 Alternative 2 – New Status Determination for Cod Stocks (*Preferred Alternative*)

Alternative 2 would adopt SDCs for the four Atlantic cod stocks (EGOM, WGOM, GB, and SNE). These stocks are being added to the FMP through this action. Establishing the SDCs is an administrative measure, and this will have no direct impact on protected species (ESA listed and MMPA protected) because it does not, in and of itself, change fishing effort or fishing behavior. For these reasons when comparing Alternative 2 to Alternative 1/No Action, the likely impacts to protected species are negligible. However, Alternative 2 may result in indirect impacts to protected species. Whatever impact indirectly precipitates from changes to SDCs or mortality targets will be discussed in the context of other alternatives (Section 6.4.3) – including ACLs – which the Council adopts in order to meet mortality targets derived from the new SDCs and control rules.

6.4.3 Action 3 – Revised Specifications for Atlantic Cod

Action 3 encompasses adjustments to ACLs for the four Atlantic cod stocks (Alternative 2) and establishment of a recreational sub-ACL for SNE cod (Alternative 3).

6.4.3.1 Alternative 1 – No Action

Under Alternative 1/No Action, the four Atlantic cod stocks (EGOM, WGOM, GB, and SNE) do not have FY2026 specifications. Given these are new stocks in the FMP, the four cod stocks do not have default specifications, and so there would be no specifications for the Atlantic cod stocks beginning May 1, 2026.

Under Alternative 1/No Action, because the four Atlantic cod stocks do not have FY2026 specifications, beginning May 1, 2026, commercial groundfish vessels would not be allowed to fish in all broad stock areas without these allocations. As a result, beginning May 1, 2026, there would be an expected halt to commercial groundfish fishing effort in all broad stock areas. Based on this information, fishing effort and behavior under Alternative 1/No Action is expected to be substantially lower than current operating conditions.

Understanding expected fishing behavior/effort in a fishery informs potential interaction risks with protected species (ESA listed and MMPA protected). Specifically, 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). Taking this into account, as well as fishing behavior/effort under the Alternative 1/No Action, impacts of Alternative 1/No Action to protected species are provided below.

MMPA (Non-ESA listed) Protected Species Impacts

The commercial groundfish fishery is prosecuted primarily with bottom otter trawl and gillnet gear; the recreational component primarily uses hook and line. As provided in Section 5.6.1, non-ESA listed species of marine mammals are at risk of interacting with all or some of these gear types, with interactions often resulting in injury or mortality to the species. Based on this, the groundfish fishery has the potential to impact these non-ESA listed marine mammal species. As provided in Section 5.6.1, in order to best classify the potential impacts of Alternative 1/No Action on MMPA protected species, we have reviewed marine mammal serious injury and mortality reports, as well as the U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments that cover the most recent 10 years of data.

Aside from several stocks of bottlenose dolphin (i.e., Western North Atlantic (WNA) Northern and Southern Migratory Coastal Stocks of bottlenose dolphins), there has been no indication that takes of non-ESA listed species of marine mammals in commercial or recreational fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself. Specifically, aside from MMPA strategic stocks identified in Table 13 in Section 5.6.1 (i.e., WNA Northern and Southern Migratory Coastal Stocks), PBR levels have not been exceeded for any of the non-ESA listed marine mammal species identified in Section 5.6.1. Although the WNA Northern and Southern Migratory Coastal Stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR level, take reduction strategies and/or plans have been implemented and are currently in place to reduce bycatch in the fisheries affecting these species (Atlantic Trawl Gear Take Reduction Strategy, Bottlenose Dolphin Take Reduction Plan (BDTRP); see Section 5.6.4.2.5 for additional information). These efforts are still in place and are continuing to assist in decreasing bycatch levels for these stocks.

Taking into consideration the above information, and the fact that there are non-ESA listed marine mammal stocks/species whose populations may or may not be at optimum sustainable levels, the impacts of Alternative 1/No Action on non-ESA listed species of marine mammals are likely to range from slight negative to moderate positive, depending on the species/stock. As provided above, some bottlenose dolphin stocks (WNA Northern and Southern Migratory Coastal Stocks) are experiencing levels of interactions that have resulted in exceedance of their PBR levels. These stocks/populations are not at an optimum sustainable level and therefore, the continued sustainability of these stocks/species is at risk. As a result, any potential for an interaction is a detriment to the species/stocks ability to recover from this condition. As previously noted, the risk of an interaction is strongly associated with the amount of gear in the water, the duration of time the gear is in the water (e.g., soak or tow duration), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases in of any of these factors. As provided in Section 5.6, the MMPA Lists of Fisheries (LOFs), as well as marine mammal stock assessment and serious injury and morality reports covering the most recent ten years of data (i.e., 2013-2022) indicate that that there have been no observed or documented interactions between bottom trawl gear and WNA Northern or Southern Migratory Coastal Stocks of bottlenose dolphins; however, records of interactions (e.g., entanglement, ingestion) with gillnet or hook and line gear have been documented with these stocks. As commercial and recreational fishing effort under Alternative 1/No Action is expected to be substantially lower from current operating conditions, with a halt in fishing effort in all broad stock areas beginning May 1, 2026, Alternative 1/No Action is not expected to introduce new or elevated interaction risks to these non-ESA listed marine mammal stocks in poor condition, and in fact could reduce risks given directed commercial groundfish fishing would halt. Specifically, the amount of gear in the water, soak or tow duration, and overlap between protected species and fishing gear could decrease relative to current conditions. Given this information, and the information provided in Section 5.6, Alternative 1/No Action is likely to result in negligible to slight negative impacts to non-ESA listed marine mammal stocks/species in poor condition (i.e., Bottlenose dolphin, WNA Northern and Southern Migratory Coastal Stocks).

Alternatively, there are also many non-ESA listed marine mammals that, even with continued fishery interactions, are maintaining an optimum sustainable level (i.e., PBR levels have not been exceeded) over the last several years. For these stocks/species, it appears that the fishery management measures that have been in place over this timeframe have resulted in levels of effort that result in interaction levels that are not expected to impair the stocks/species ability to remain at an optimum sustainable level. These fishery management measures, therefore, have resulted in indirect slight positive impacts to these non-ESA listed marine mammal species/stocks. Should future fishery management actions maintain similar operating conditions as they have over the past several years, it is expected that these slight positive impacts would remain. As provided above, Alternative 1/No Action is expected to result in lower commercial and recreational fishing effort relative to recent levels, with the expected halt in fishing effort in all broad stock areas beginning May 1, 2026. Given this, and the fact that gear interaction risks vary between non-ESA listed marine mammal species in good condition (e.g., humpback whales are the only large whale species in which interactions with bottom trawl have been observed or documented; see Section 5.6.1), the impacts of Alternative 1/No Action on these non-ESA listed species of marine mammals are expected to be negligible to moderate positive (i.e., lower directed fishing effort from current operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

ESA Listed Species

The commercial groundfish fishery is prosecuted primarily with bottom otter trawl and gillnet gear; the recreational component primarily uses hook and line gear. As provided in Section 5.6.1, ESA listed species of whales, sea turtles, Atlantic sturgeon, Atlantic salmon, and giant manta rays are at risk of interacting with all or some of these gear types, with interactions often resulting in injury or mortality to the species. Based on this, the groundfish fishery is likely to result in some level of negative impacts to ESA listed species. Taking into consideration fishing behavior/effort under Alternative 1/No Action, as well the fact that interaction risks with protected species are strongly associated with the amount of gear in the water, the duration of time the gear is in the water (e.g., soak or tow duration), and the presence of protected species in the same area and time as the gear, we determined the level of impacts to ESA listed species to be negligible to slight negative. Below, we provide support for this determination.

As provided above, under Alternative 1/No Action there would be no specifications for the four Atlantic cod stocks in FY2026. Given that without specifications for the four Atlantic cod stocks there would be a halt in fishing effort in all broad stock areas beginning May 1, 2026, resultant fishing behavior and effort in the groundfish fishery is expected to be substantially lower than what has been observed in the fishery over this timeframe. Specifically, the amount of gear (i.e., bottom trawls, gillnets, hook and line), tow or soak durations, and area fished would be expected to decrease from current operating conditions. As noted above, interaction risks with protected species are strongly associated with the amount of gear in the water, the duration of time the gear is in the water (e.g., soak or tow duration), and the presence of protected species in the same area and time as the gear. Lower fishing behavior/effort relative to recent years would mean that Alternative 1/No Action is not expected to introduce new or elevated interaction risks to any ESA-listed species, and in fact could lower risks to any ESA-listed species. Based on this, the information provided in Sections 5.6 and 6.4, and the fact that the groundfish fishery must comply with the Atlantic Large Whale Take Reduction Plan (ALWTRP), the impacts of Alternative 1/No Action alternative on ESA listed species is expected to be negligible to slight negative. Negligible impacts are associated with those species in which interactions with gear types used in the groundfish fishery have never been observed or documented (e.g., bottom trawl gear: North Atlantic right, sei, and fin whales), and slight negative impacts are associated with those species in which interactions (based on observed or documented take) are possible with gillnet, bottom trawl, and/or hook and line gear (see Section 5.6.4).

Overall Impacts to Protected Species

Based on the above protected species (i.e., ESA-listed and MMPA protected) impact analysis, overall impacts of Alternative 1/No Action on protected species are expected to be slight negative to moderate positive. Relative to Alternative 2, Alternative 1/No Action may result in negligible to highly positive impacts to protected species. Although the total ACLs between Alternative 1/No Action and Alternative 2 do vary, all proposed ACLs are within the range of ACLs authorized within the fishery over the last five (or more) years. As a result, on the basis of ACLs alone, any changes in fishing effort or behavior between either Alternative are not expected to be significant. However, as Alternative 1/No Action will not have specifications specified for the four Atlantic cod stocks beginning May 1, 2026, there would be an expected halt in commercial groundfish fishing effort in all broad stock areas. The latter would equate to less fishing time, and therefore, less gear being present in the water. As protected species (ESA listed and MMPA protected species) interactions with gear, regardless of listing status, is greatly influenced by the amount of gear, the duration of time the gear is in the water (e.g., soak or tow duration), and the presence of protected species in the same area and time as the gear, any decrease in either of these factors will reduce the potential for protected species interactions with gear. Based on this information, Alternative 1/No Action may provide some benefit to protected species relative to Alternative 2 beginning

May 1, 2026, and could potentially have highly positive impacts on protected species compared to Alternative 2.

6.4.3.2 Alternative 2 – Revised Specifications (*Preferred Alternative*)

In general, relative to Alternative 1/No Action, the new specifications adopted under Alternative 2 will result in the four Atlantic cod stocks experiencing an increase in the total ACL. Given these are new stocks in the FMP, the four Atlantic cod stocks do not have FY2024 ACLs to directly compare, though collectively there is a decrease in ACL summed across all cod stocks.

Annual catch limits can be considered a proxy for relative fishing effort (e.g., amount of gear set or towed, gear soak or tow duration, number of trips, number of vessels) and behavior (e.g., area fished). As information on fishing effort and behavior informs potential interaction risks to protected species, changes (if any) in ACL can be used as a means to identify potential changes in fishing behavior/effort from one year to the next, and therefore, used to identify new or additional interaction risks to a protected species. As Alternative 2 will result in an increase in the ACL for several stocks, some increase in effort is possible under Alternative 2; however, any potential increase in effort is expected to be tempered by constraining stocks that are spread out across broad stock areas (see Economic Impacts, Section 6.5.2.2). In particular, collectively across the Atlantic cod stocks there is a decrease in ACLs (see Table 67 in Economic Impacts, Section 6.5.2.2). WGOM cod is predicted to be the most constraining stock (see Economic Impacts, Section 6.5.2.2), and the majority of landings and revenue occur on groundfish trips within the WGOM cod stock area (see Table 31).

With respect to cod management transition, behavioral changes in the fishery may occur due to the transition from two cod stocks to four in FY2026, which could result in changes in effort relative to current operating conditions. For example, as noted in Economic Impacts (Section 6.5.3.2), few trips occurred in the EGOM cod broadstock area during FY2023. With separate WGOM and EGOM cod quotas in FY2026, and the WGOM quota predicted to be highly constraining, there may be a shift in effort to EGOM. This would be expected to potentially occur for vessels fishing in the northern portion of the WGOM near the EGOM stock boundary. Given economic considerations (e.g., fuel costs) and vessel operational limitations particularly for smaller size-class vessels, it is not anticipated that vessels would shift effort substantially from where their fishing activity currently takes place, for the WGOM stock area and across all cod stock areas. Given the predicted constraining nature of several groundfish stocks, including WGOM cod and GB cod, some vessels could choose not to fish if they do not have available ACE or if ACE lease prices become substantially higher. Vessels may also opt to reduce the amount of gear set or set gear for shorter durations in an effort to avoid the constraining cod stocks.

Based on this, and the fact that the proposed specifications under Alternative 2 are no greater than or are within the range of the specifications that have been authorized by the fishery over the last five or more years, resultant fishing behavior and effort in the groundfish fishery is expected to remain similar to what has been observed in the fishery over this timeframe or potentially decrease. Specifically, the amount of gear (hook and line, bottom trawls and gillnets), tow or soak durations, and areas fished are not expected to change significantly from current operating conditions and could in fact decrease.

As noted above, interaction risks with protected species are strongly associated with the amount of gear in the water, the duration of time the gear is in the water (e.g., soak or tow duration), and the presence of protected species in the same area and time as the gear. As Alternative 2 is not expected to change any of these operating conditions and is not expected to result in significant changes in effort/behavior, new or elevated interaction risks with protected species are not expected. Based on this, the information provided in Section 5.6 and 6.4, and the fact that the groundfish fishery must comply with the take reduction plans (i.e., Harbor Porpoise Take Reduction Plan (HPTRP), the BDTRP, ALWTRP; see Section 5.6.4.2.5), impacts of Alternative 2 on protected species (i.e., ESA listed and MMPA protected) are expected to be slight negative to slight positive (see Alternative 1/No Action for rationale behind negligible versus slight negative determination).

Relative to Alternative 1/No Action, Alternative 2 is likely to result in slight negative to negligible impacts to protected species (ESA-listed and MMPA protected). As provided above, under Alternative 1/No Action, beginning May 1, 2026, the four Atlantic cod stocks (EGOM, WGOM, GB, and SNE) would not have ACLs specified and so commercial groundfish fishing effort in all broad stock areas is expected to halt beginning May 1, 2026. A halt in operations is not expected under Alternative 2; thus, Alternative 2 could potentially have slight negative impacts on protected species compared to Alternative 1/No Action.

6.4.3.3 Alternative 3 – Southern New England Cod Recreational Sub-ACL (*Preferred Alternative*)

6.4.3.3.1 Option 1 – No Action

Option 1/No Action would not set a recreational sub-ACL for SNE cod. Recreational fishery catches of SNE cod would be attributed to the state and other sub-components. As this would result in status quo operating conditions, Option 1/No Action is not expected to result in any significant changes in fishing behavior or effort relative to current operating conditions. As fishing behavior and effort are not expected to change significantly from status quo conditions, the presence, quantity, or degree of recreational gear (i.e., hook and line) used in the Southern New England broadstock area are also not expected to change significantly. As provided above, interaction risks with protected species are strongly associated with amount of gear in the water, the duration of time the gear is in the water (e.g., soak duration), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases of any or all of these factors. Continuation of "status quo" fishing behavior/effort is not expected to change any of these operating conditions and therefore, relative to current conditions, new or elevated (e.g., more gear) interaction risks to protected species (MMPA protected and ESA listed) are not expected. For these, and the reasons provided in Section 5.6.1 for MMPA protected (non-ESA listed) and ESA listed species, expected impacts of Option 1/No Action on protected species are likely negligible to slight negative.

Compared to Option 2, Option 1/No Action is expected to have negligible to slight negative impacts on protected species as under Option 1/No Action the recreational fishery, which accounts for most of the catch of SNE cod (see Table 58 and Table 59) would not have an allocation or accountability measures, which could translate to less control over catch and potentially less constraint on recreational fishery effort, as would be the case with Option 2.

6.4.3.3.2 Option 2 – Set Southern New England Cod Recreational Sub-ACL (*Preferred Option*)

Option 2 would set a sub-ACL for the recreational fishery for SNE cod. The recreational fishery contributes to the majority of catch of SNE cod (see Table 58 and Table 59), and so setting an allocation and AMs for this component of the groundfish fishery would be expected to result in more control over catch for this stock. Based on this, Option 2 will provide no incentive for effort to increase in the recreational fishery and in fact, effort is not expected to be any greater than that under Option 1/No Action. Based on this, overall impacts to protected species (i.e., ESA-listed and MMPA protected) are expected to be similar to those provided above for Option 1/No Action, negligible to slight negative; for rationale to support this determination see Option 1/No Action, section 6.4.3.3.1. Taking into consideration the above, compared to Option 1/No Action, Option 2 is expected to have negligible to slight positive impacts on protected species, especially as Option 2 is expected to result in more control over the recreational fisheries catch of SNE cod and therefore, potentially more constraint on the recreational fishery.

6.4.4 **Action 4 – Commercial Fishery Management Measures – Atlantic Cod**

Action 4 encompasses commercial fishery management measures to address Phase 1 of the Council's Atlantic Cod Management Transition Plan, which are the common pool accountability measures for the revised Atlantic cod stocks (Alternative 1).

6.4.4.1 Alternative 1 – Common Pool Accountability Measures for Cod Stocks (*Preferred Alternative*)

6.4.4.1.1 **Option 1 – No Action**

Under Option 1/No Action, there would be no trimester TAC measures specified for the four revised Atlantic cod stocks, and default common pool trip limits would not be updated to reflect the revised cod stock units and would apply to the geographic areas associated with the former two cod stocks. As a result, Option 1/No Action is not expected to result in any significant changes in fishing behavior or effort relative to current operating conditions. As fishing behavior and effort are not expected to change significantly from status quo conditions, the presence, quantity, or degree of gear (e.g., bottom trawl, gillnet, hook and line) used in the groundfish broadstock areas are also not expected to change significantly. As provided above, interaction risks with protected species are strongly associated with the amount of gear in the water, the duration of time the gear is in the water (e.g., soak or tow duration), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases of any or all of these factors. Continuation of "status quo" fishing behavior/effort is not expected to change any of these operating conditions and therefore, relative to current conditions, new or elevated (e.g., more gear) interaction risks to protected species (MMPA protected and ESA listed) are not expected. For these, and the reasons provided in Section 5.6.1 for MMPA protected (non-ESA listed) and ESA listed species, expected impacts of Option 1/No Action on protected species are likely negligible to slight negative.

Without common pool measures updated to reflect the four revised Atlantic cod stocks, there is an increased potential that trimester TAC measures would not be as constraining for common pool catch since these AMs would not be specified in terms of the four new cod stock units. Thus, when compared to Option 2 and Option 3, Option 1/No Action is expected to have negligible to slight negative impacts on protected species.

6.4.4.1.2 **Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closures Areas for Cod Stocks (*Preferred Option*)**

Option 2 would adopt common pool trimester TAC distributions and trimester TAC closure areas for the four revised Atlantic cod stocks. The trimester TAC distributions and trimester TAC closure areas would reflect the most recent catch data. The TAC apportionment amongst trimesters is not expected to create any incentive to increase or change effort amongst trimesters relative to current operating conditions. The changes being made are reflective of current operating conditions in the fishery and thus the trimester distributions are reflective of what the fishery has caught or has the potential to catch within a specific trimester. Common pool sub-ACLs that form the basis of the trimester TAC amounts are quite low for several of the cod stocks, especially SNE cod (see Table 7). While it is expected that these sub-ACLs for the revised cod stocks combined with the trimester TACs and trip limits would serve to constrain effort to avoid closing the TAC areas early, the SNE cod sub-ACL and trimester TACs are so low relative to recent fishing effort that even with constrained effort it is likely inevitable that trimester closures will occur in the SNE stock area. Given this, there is a higher likelihood that trimesters may close early compared to current operating conditions, particularly for the SNE cod area. Sub-ACLs for other groundfish stocks are within the range specified over the most recent five years or more. As a result, under Option 2, fishing behavior and effort (e.g., gear quantity, soak/tow duration, area fished) within a specific trimester are not expected to change significantly from current operating conditions and could decrease. Based on this, new or elevated (e.g., more gear) interaction risks to protected species (ESA listed and MMPA protected species) are not expected. For these, and the reasons provided in Section 5.6.1 for MMPA protected (non-ESA listed) and ESA listed species, expected impacts of Option 2 on protected species are likely slight negative to slight moderate positive.[29]

Compared to Option 1/No Action, Option 2 is expected to have negligible to slight moderate positive impacts on protected species for the reasons provided above. Option 2 would have negligible impacts on protected species compared to Option 3, since both measures work together to control common pool catch.

6.4.4.1.3 Option 3 – Common Pool Baseline Trip Limits for Cod Stocks (*Preferred Option*)

Option 3 would establish baseline common pool trip limits for the revised Atlantic cod stock units. Baseline trip limits reflect the most recent catch data. The baseline trip limits are not expected to create any incentive to increase or change effort relative to current operating conditions. Common pool sub-ACLs that inform the baseline trip limits are quite low for several of the cod stocks, especially SNE cod (see Table 6). As a result, under Option 3, fishing behavior and effort (e.g., gear quantity, soak/tow duration, area fished) are not expected to change significantly from current operating conditions and could decrease. Based on this, new or elevated (e.g., more gear) interaction risks to protected species (ESA listed and MMPA protected species) are not expected. For these, and the reasons provided in Section 5.6.1 for MMPA protected (non-ESA listed) and ESA listed species, expected impacts of Option 3 on protected species are likely slight negative to slight moderate positive.[30]

Compared to Option 1/No Action, Option 3 is expected to have negligible to slight moderate positive impacts on protected species for the reasons provided above. Option 3 would have negligible impacts on protected species compared to Option 2, since both measures work together to control common pool catch.

6.4.5 Action 5 - Recreational Fishery Management Measures – Atlantic Cod

Action 5 encompasses recreational fishery management measures to address Phase 1 of the Council's Atlantic Cod Management Transition Plan, including recreational measures for SNE cod (Alternative 1) and a temporary administrative measure to allow the Regional Administrator authority to adjust recreational measures for EGOM and GB cod (Alternative 2).

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[29] Impacts to ESA listed species are expected to range from negligible to slight negative. Impacts to MMPA protected species (non-ESA listed) are expected to range from slight negative to slight moderate positive. Rationale in support of this determination is provided in section 6.4.2.1.

[30] Impacts to ESA listed species are expected to range from negligible to slight negative. Impacts to MMPA protected species (non-ESA listed) are expected to range from slight negative to slight moderate positive. Rationale in support of this determination is provided in section 6.4.2.1

6.4.5.1 Alternative 1 – Recreational Fishing Measures for Southern New England Cod (*Preferred Alternative*)

6.4.5.1.1 Option 1 – No Action

Under Option 1/No Action, there would be no limit set for recreational possession of SNE cod. The minimum size for cod outside the geographically defined GOM regulated mesh area would remain 23 inches. It is not entirely known whether having no limit set for recreational possession of SNE cod would increase fishing effort relative to current operating conditions, as it is not fully known the degree to which anglers are catching cod while fishing for other species (e.g., tautog) versus targeting cod. See Section 6.5.5.1.2 for further discussion. It is likely that effort under a scenario of no limit set for recreational possession of SNE cod would remain similar to status quo under current recreational measures for "GB cod" as anglers have not been catching the bag limit in recent years, whether due to targeting preferences or availability of fish. Thus, while there is the potential that effort could increase slightly relative to status quo, it is more likely that a similar level of effort in the Southern New England cod broadstock area would continue relative to current operating conditions. As a result, under Option 1/No Action, fishing behavior and effort (e.g., gear quantity, soak/tow duration, area fished) are not expected to change significantly from current operating conditions. Based on this, new or elevated (e.g., more gear, longer soak durations) interaction risks to protected species (ESA listed and MMPA protected species) are not likely but could occur. For these, and the reasons provided in Section 5.6.1 for MMPA protected (non-ESA listed) and ESA listed species, expected impacts of Option 1/No Action on protected species are uncertain, with likely slight negative to slight positive impacts.[31]

Compared to Option 2, Option 1/No Action is expected to have negligible to slight negative impacts on protected species, as there is no potential under Option 1/No Action for effort to decrease relative to current operating conditions as there is under Option 2.

6.4.5.1.2 Option 2 – Recreational Fishing Measures for Southern New England Cod (*Preferred Option*)

Under Option 2, SNE cod would be zero possession for recreational fishermen (charter/party and private anglers). The effect of zero possession on fishing effort is difficult to determine, as it is not fully known the degree to which anglers are catching cod while fishing for other species (e.g., tautog) versus targeting cod, and how zero possession would influence fishing effort and behavior. For anglers encountering cod while fishing for other species, their fishing activity is expected to continue at current levels and areas within the SNE cod broadstock area, while anglers with strong preferences for cod could reduce or eliminate their fishing activity altogether. See Section 6.5.5.1.2 for further discussion. Thus, it is anticipated that a similar level of effort in the Southern New England cod broadstock area would continue, or perhaps there could be a decrease in effort (e.g. reduced number of trips) if anglers with strong preferences for cod choose to reduce or eliminate their fishing activity, but Option 2 is not expected to create any incentive to increase effort relative to current operating conditions. As a result, under Option 2, fishing behavior and effort (e.g., gear quantity, soak/tow duration, area fished) are not expected to change significantly from current operating conditions. Based on this, new or elevated (e.g., more gear, longer soak durations) interaction risks to protected species (ESA listed and MMPA protected species) are not expected. For these, and the reasons provided in Section 5.6.1 for MMPA protected (non-

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[31] Impacts to ESA listed species are expected to range from negligible to slight negative. Impacts to MMPA protected species (non-ESA listed) are expected to range from negligible to slight positive. Rationale in support of this determination is provided in section 6.4.2.1.

ESA listed) and ESA listed species, expected impacts of Option 2 on protected species are uncertain, with likely slight negative to slight moderate positive impacts.[32]

Compared to Option 1/No Action, Option 2 is expected to have negligible to slight moderate impacts on protected species given there is a potential for a decrease in effort under Option 2. However, the likelihood or extent of this potential decrease in effort is uncertain.

6.4.5.2 Alternative 2 - Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks (*Preferred Alternative*)

6.4.5.2.1 Option 1 – No Action

Under Option 1/No Action, the regulatory process that the Regional Administrator follows to adjust recreational fishing measures for stocks with recreational sub-ACLs only would be maintained. There would not be a regulatory process by which the Regional Administrator could adjust recreational measures for EGOM and GB cod. Council action would be needed to set recreational measures for EGOM and GB cod. This is an administrative measure because it does not, in and of itself, change fishing effort or behavior. For these reasons when comparing Option 1/No Action to Option 2, the likely impacts to protected species are negligible.

6.4.5.2.2 Option 2 - Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod (*Preferred Option*)

Under Option 2, a temporary regulatory process for the Regional Administrator to adjust recreational fishing measures for Eastern Gulf of Maine (EGOM) cod and Georges Bank (GB) cod for FY2026 only would be established. This is in addition to the regulatory process for the Regional Administrator to adjust recreational fishing measures for stocks with recreational sub-ACLs. Establishing a temporary regulatory process for the Regional Administrator to adjust recreational fishing measures for Eastern Gulf of Maine (EGOM) cod and Georges Bank (GB) cod for FY2026 only is an administrative measure and this will have no direct impact on protected species (ESA listed and MMPA protected) because it does not, in and of itself, change fishing effort or fishing behavior. For these reasons when comparing Option 2 to Option 1/No Action, the likely impacts to protected species are negligible.

6.5 IMPACTS ON HUMAN COMMUNITIES – ECONOMICS

Consideration of the economic impacts of the changes made in this framework is required pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976. NEPA requires that before any federal agency may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that includes the integrated use of the social sciences (NEPA Section 102(2) (C)). The MSA stipulates that the social and economic impacts to all fishery stakeholders should be analyzed for each proposed fishery management measure to provide advice to the Council when making regulatory decisions (Magnuson-Stevens Section 1010627, 109-47).

The National Marine Fisheries Service (NMFS) provides guidelines to use when performing economic reviews of regulatory actions. The key dimensions for this analysis are expected changes in net benefits to

[32] Impacts to ESA listed species are expected to range from negligible to slight negative. Impacts to MMPA protected species (non-ESA listed) are expected to range from negligible to slight moderate positive. Rationale in support of this determination is provided in section 6.4.2.1.

fishery stakeholders, the distribution of benefits and costs within the industry, and changes in income and employment (NMFS 2007). Where possible, cumulative effects of regulations are identified and discussed. Non-economic social concerns are discussed in Section 6.6. The economic impacts presented here consist of both qualitative and quantitative analyses dependent on available data, resources, and the measurability of predicted outcomes. It is assumed throughout this analysis that changes in revenues would have downstream impacts on income levels and employment; however, these are only mentioned if directly quantifiable.

6.5.1 Action 1 – Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

6.5.1.1 Alternative 1 – No Action

Alternative 1/No Action has no direct or indirect economic impacts. Impacts are determined from the implementing measures in Actions 2 – 5. Under Alternative 1/No Action, the possible measures for Actions 2 – 5 would be limited to Alternative 1/No Action under each action.

6.5.1.2 Alternative 2 – Status Quo

Alternative 2 has no direct or indirect economic impacts. Impacts are determined from the implementing measures in Actions 2 – 5. Under Alternative 2, the possible measures for Actions 2 – 5 would be limited to Alternative 1/No Action under each action.

6.5.1.3 Alternative 3 – Revise Atlantic Cod Stock Units in the FMP (*Preferred Alternative*)

Alternative 3 has no direct or indirect economic impacts. Impacts are determined from the implementing measures in Actions 2 – 5.

6.5.2 Action 2 – Atlantic Cod Status Determination Criteria

6.5.2.1 Alternative 1 – No Action

Under Alternative 1/No Action, status determination criteria (SDCs) would not be adopted for the four new Atlantic cod stock units. Economic impacts in the short term would be negative, as there would not be SDCs specified for the four Atlantic cod stocks with which to specify OFLs, ABCs, and ACLs. In the long-term, biomass targets would not be based on the latest scientific information, increasing the risk of overfishing, and eroding long fishery net revenues over the long term. Overall, Alternative 1/No Action is expected to have negative economic impacts, and negative impacts when compared to Alternative 2.

6.5.2.2 Alternative 2 – New Status Determination for Cod Stocks (*Preferred Alternative*)

Alternative 2 would adopt new SDCs for the four Atlantic cod stock units. In the short term, economic impacts could be positive or negative, since SDCs are needed to specify OFLs, ABCs, and ACLs, and these levels of catch may be lower than the fishery has experienced. In the long-term, Alternative 2 is expected to have positive economic impacts, since adopting SDCs for the four new Atlantic cod stocks according to the most recent scientific assessments decreases the likelihood of overfishing or the stock becoming overfished over the long run, which allows for increased fishery revenues. Overall, Alternative

2 is expected to have low positive economic impacts. Compared to Alternative 1/No Action, economic impacts are expected to be positive.

6.5.3 Action 3 – Revised Specifications for Atlantic Cod

6.5.3.1 Alternative 1 – No Action

Commercial Groundfish Fishery - Sector component

Under Alternative 1/No Action, the four Atlantic cod stocks (WGOM cod, EGOM cod, GB cod, and SNE cod) would not have FY2026 ACLs specified. For these stocks, there would be no specifications and no allocations, and without ACE, the sector fishery would not be able to operate in all broad stock areas. Current management measures require that a sector stop fishing in a stock area if it does not have ACE for a given stock. Alternative 1/No Action would have high negative impacts for the sector fishery compared to Alternative 2. Without cod specifications in place on May 1, 2026, the sector fishery would effectively be shut down unless, or until, new specifications were implemented.

Commercial Groundfish Fishery - Common Pool

Under Alternative 1/No Action, the four Atlantic cod stocks (WGOM cod, EGOM cod, GB cod, and SNE cod) would not have FY2026 ACLs specified. For these stocks, there would be no specifications and therefore would have high negative impacts on the common pool fishery under Alternative 1/No Action relative to Alternative 2. Without cod specifications in place on May 1, 2026, the common pool fishery would not be able to direct fishing on these stocks and is expected to be limited to fishing outside the areas where Atlantic cod is primarily caught commercially.

Recreational Groundfish Fishery

WGOM cod – Under Alternative 1/No Action, there would be no new WGOM cod sub-ACL for the recreational fishery. Relative to Alternative 2, the economic impacts of No Action would be negative since a catch limit would not be allocated.

SNE cod - See Section 6.5.3.3

6.5.3.2 Alternative 2 – Revised Specifications (*Preferred Alternative*)

Comparisons between FY2025 and proposed FY2026 commercial sub-ACLs, recreational sub-ACLs, and other fisheries sub-ACLs for groundfish are provided in Table 65 and Table 66. While the four Atlantic cod stocks are new to the FMP and do not have FY2025 ACLs to make a direct comparison to, Table 67 also provides a comparison between the commercial groundfish fishery sub-ACLs for FY2025 summed across the two old/current cod stocks (GOM and GB) and proposed FY2026 sub-ACLs summed across the four new cod stocks (EGOM, WGOM, GB, SNE).

The four Atlantic cod stocks (EGOM cod, WGOM cod, GB cod, SNE cod) would not have FY2026 ACLs specified under Alternative 1/No Action. Therefore, Alternative 2 would have positive impacts compared to Alternative 1/No Action for these stocks since specifications would be in place.

Table 65 – Comparison of commercial (sector and common pool) groundfish sub-ACLs (mt) for FY2025 (based on May 1, 2025 emergency action) and proposed FY2026, including the percent change between years of the total amount of cod across the cod stocks. Proposed FY2026 sub-ACLs as indicated under Alternative 2/Revised Specifications.

<table>
<tr><th></th><th colspan="2">Commercial groundfish sub-ACL</th><th></th></tr>
<tr><th>Existing Stocks (FY2025)</th><th>FY2025</th><th>Proposed FY2026</th><th>Proposed Stocks (FY2026)</th></tr>
<tr><td rowspan="2">GOM Cod</td><td rowspan="2">176.3</td><td>36.5</td><td>EGOM Cod</td></tr>
<tr><td rowspan="2">289.8</td><td rowspan="2">WGOM Cod</td></tr>
<tr><td rowspan="3">GB Cod</td><td rowspan="3">139.9</td></tr>
<tr><td>92.6</td><td>GB Cod</td></tr>
<tr><td>6.7</td><td>SNE Cod</td></tr>
<tr><td>Total Cod (2 stocks)</td><td>316.2</td><td>425.6</td><td>Total Cod (4 stocks)</td></tr>
<tr><td>Percent change from FY2025 to FY2026</td><td colspan="2">+34.6%</td><td></td></tr>
</table>

Table 66 – Comparison of other fisheries sub-ACLs (mt) for FY2025 and proposed FY2026. Proposed FY2026 sub-ACLs as indicated under Alternative 2/Revised Specifications.

<table>
<tr><th></th><th colspan="2">Recreational groundfish sub-ACL</th><th></th></tr>
<tr><th>Existing Stocks (FY2025)</th><th>FY2025</th><th>Proposed FY2026</th><th>Proposed Stocks (FY2026)</th></tr>
<tr><td rowspan="2">GOM Cod</td><td rowspan="2">120</td><td>n/a</td><td>EGOM Cod</td></tr>
<tr><td rowspan="2">118</td><td rowspan="2">WGOM Cod</td></tr>
<tr><td rowspan="3">GB Cod</td><td rowspan="3">n/a</td></tr>
<tr><td>n/a</td><td>GB Cod</td></tr>
<tr><td>18</td><td>SNE Cod</td></tr>
</table>

Table 67 – Comparison of commercial groundfish fishery sub-ACLs (mt) for FY2024 summed across the two existing cod stocks (GOM and GB) and proposed FY2026 summed across the four new cod stocks (EGOM, WGOM, GB, SNE), including the percent change between years. Proposed FY2026 sub-ACL reflects the summed sub-ACLs for EGOM cod, WGOM cod, GB cod, and SNE cod, as indicated under Alternative 2/Revised Specifications.

<table>
<tr><th colspan="3">Commercial groundfish sub-ACL summed across cod stocks</th></tr>
<tr><th>FY2024
GOM + GB</th><th>Proposed FY2026
EGOM + WGOM + GB + SNE</th><th>% Change</th></tr>
<tr><td>667.4</td><td>425.6</td><td>-36%</td></tr>
</table>

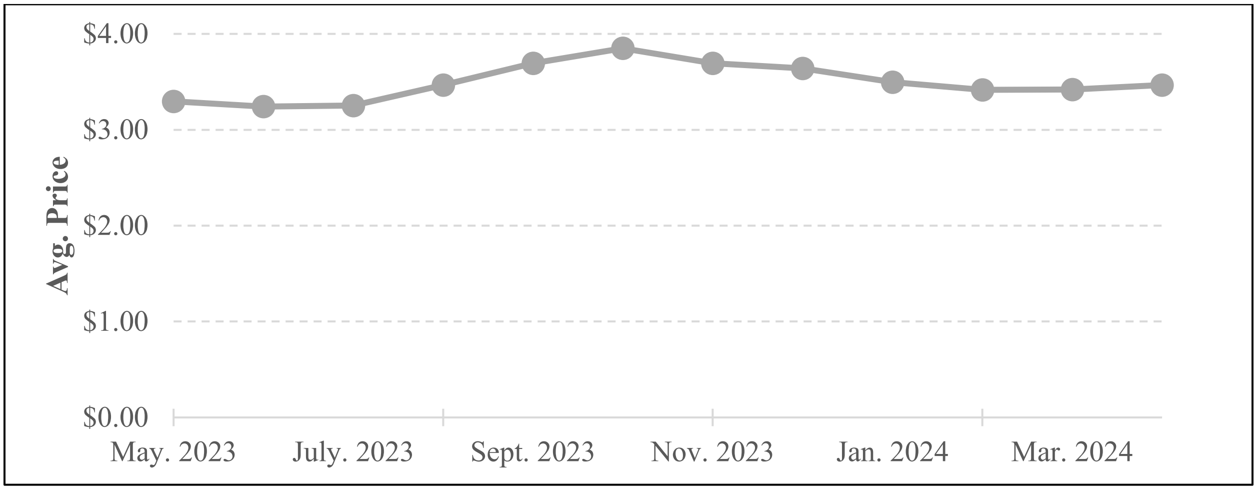
Commercial Groundfish Fishery - Sector component

Quota Change Model

Methods

The Quota Change Model (QCM) is used to analyze the impacts of each combination of measures on the sector portion of the groundfish fishery, which has comprised 99% of commercial groundfish revenues over the last five fishing years (see Section 5.7). The QCM is a Monte Carlo simulation model that selects from existing records the trips most likely to take place under new regulatory conditions. To do this, a large pool of actual trips is created from a reference dataset. For this prediction, the reference dataset consists of groundfish trips taken from the 2023 fishing year (May 1, 2023 – April 30, 2024). The composition of this pool is conditioned on each trip's utilization of allocated Annual Catch Entitlement (ACE), under the assumption that the most likely trips to take place in the fishing year being analyzed are those fishing efficiently under the new sector sub-ACLs. The more efficiently a trip uses its ACE, the more likely that trip is to be drawn into the sample pool. ACE efficiency is determined by the ratio of ACE expended to net revenues on a trip, iterated over each of the 17 allocated stocks. Operating profits are calculated as gross revenues minus trip costs minus the opportunity cost of quota, where trip costs are estimated using observer data (Figure 37) and quota opportunity costs are estimated from a model of inter-sector lease price and quantity data.

Figure 37 – Monthly average fuel price (nominal $), sector vessel trips, May 2023 – April 2024.



Source: Northeast Fisheries Observer Program (NEFOP) and At-Sea Monitoring (ASM) data.

Once the sample pool is constructed, trips are pulled from the pool at random, summing up the ACE expended for the 17 allocated stocks as each trip is drawn. When one stock's ACE reaches the sector sub-ACL limit, no further trips from that broad stock area are selected. The model continues selecting trips until sector sub-ACLs are achieved for areas that encompass the WGOM cod and GB broadstock areas or, alternatively, if sub-ACLs are reached for one of the unit stocks.

The model does not continue selecting trips even if EGOM cod and/or SNE cod/winter flounder/yellowtail flounder quota is available. This decision is based on the low levels of utilization for these stocks in recent years. However, this is an important assumption as the fishery could, for example, harvest more in the EGOM than in previous years due to the split of the WGOM and EGOM cod stocks. As will be shown in the model results, the WGOM cod quota is predicted to be far more constraining to the fishery than the EGOM cod quota.

This selection process forms a synthetic fishing year. A total of 250 synthetic years are constructed, and median values and confidence intervals are reported. By running simulations based on actual fishing trips, the model implicitly assumes that:

- stock conditions, fishing practices and harvest technologies existing during the data period are representative;
- sector enrollment from the data period are representative (i.e. a shift from sectors to the common pool could cause an overestimate in fishery revenue);
- trips are repeatable;

- demand for groundfish is constant, noting that fish prices do vary between the reference population and the sample population, but this variability is consistent with the underlying price/quantity relationship observed during the reference period;
- quota opportunity costs and operating costs are both constant;
- ACE flows seamlessly from lesser to lessee such that fishery-wide caps can be met without leaving ACE for constraining stocks stranded;
- At-Sea Monitoring (ASM) costs are fully subsidized; and
- the condition of a trip being observed has no explicit effect on its ability to be chosen into the selection pool.
- Allocations to individual sectors are not considered, as the fishery is modeled as a whole.

The net effect of the constraints imposed by these assumptions is unclear. The selection algorithm draws mainly from efficient trips—if fishermen make relatively less efficient trips, the model estimates will be biased high. Through a combination of technological improvement (gear rigging, equipment upgrades, etc.) or behavioral modifications, fishermen are likely to improve on their ability to avoid constraining stocks. If these adjustments are successful, the model predictions may be biased low. Furthermore, the model will under-predict true landings and/or revenues if stock conditions for non-constraining stocks improve, if demand for groundfish rises, or if fishing practices change and fishermen become more efficient at maximizing the value of their ACE. Conversely, the model will over-predict true landings and/or revenues if stock conditions of non-constraining stocks decline, markets deteriorate, or fishing costs increase.

The model is intended to capture fishery-wide behavioral changes with respect to groundfish sub-ACL changes, and groundfish catch is maximized by the constrained optimization algorithm. Catch of non-groundfish stocks on groundfish trips are captured in the model, but not explicitly modeled, such that constraints on other fisheries are not incorporated.

Performance of the QCM from recent fishing years is shown in Table 68. The fishery experienced an uptick in landings and revenue during FY2020 not predicted by the model. With moderately higher levels of revenue in FY2020 – FY2021, the model predicted similar results for FY2022 that did not materialize. While the 2024 fishing year is ongoing, the model predictions appear to be more accurate than in previous years. Current projections, based on landings/revenue from May – October 2024 are $39.6M in groundfish revenue and $57.8M in total revenue from groundfish trips. These values would represent $1.2M (3%) and $0.4M (1%) less than the Framework (FW) 66 QCM predictions.

The QCM was run in 2024 as part of the analysis to implement the four new cod stocks in FY2025. Because of the disapproval of the original submission of Amendment 25 and the subsequent need for the Council to reconsider and submit a revised version of Amendment 25, implementation is now intended for FY2026. At this time, there is not enough information to rerun the QCM using FY2026 specifications that will be included in a future Framework. Therefore, the results that follow are the results from the QCM to predict FY2025 revenues, which are the best available analysis for this action.

Table 68 – Performance of Quota Change Model, fishing years 2020 – 2024. Revenues and costs are for the sector component of the groundfish fishery (nominal USD, millions).

	FY2020		FY2021		FY2022		FY2023		FY2024
	Predicted[33]	Realized	Predicted[34]	Realized	Predicted[35]	Realized	Predicted[36]	Realized	Predicted[37]
Groundfish Revenue	49.0	55.4	45.3	51.9	51.9	45.1	47.9	41.7	40.8
Total Revenue	70.1	75.8	63.5	75.1	73.3	66.6	74.2	61.6	58.2
Operating Cost	12.5	15.0	10.9	16.1	10.9	17.5	19.1	15.5	15.0
Sector Cost	1.9	2.2	1.8	1.6	1.8	1.5	1.5	1.5	1.3
Quota Cost	5.4	2.9	3.6	4.3	2.7	4.2	4.3	6.1	6.1
Operating Profit	50.3	55.7	47.1	53.1	59.4	43.4	51.0	38.5	36.1

[33] FW59, reference pool=FY2018

[34] FW61, reference pool=FY2019

[35] FW63, reference pool= September 2020 – August 2021

[36] FW65, reference pool= November 2021 – October 2022

[37] FW66, reference pool= November 2022 – October 2023. FY2024 groundfish revenue from May – October 2024 is $20.1M; projection for FY is $39.6M.

Results

Table 69 – Summary of realized FY2023 and predicted FY2024 and FY2025 revenues and costs for the sector portion of the commercial groundfish fishery; median values; nominal dollars (millions).

Option	Groundfish Gross Revenues	Total Gross Revenues	Operating Cost	Sector Cost	Quota Cost	Operating Profit	Days Absent
FY2023 Realized	41.7	61.6	14.8	1.4	6.1	39.3	8,914
FY2023 Prediction	47.9	74.2	19.1	1.5	4.3	51.0	8,994
FY2024 Prediction	40.8	58.2	15.0	1.3	6.1	36.1	8,342
FY2025 Prediction (Alt 2; MUB[1])	33.5	49.1	10.8	1.1	4.8	32.3	6,699
FY2025 Prediction (Alt 2; no MUB[2])	34.7	51.7	11.6	1.2	5.0	33.9	7,192

[1] MUB in place for all groundfish stocks.

[2] MUB removed for all groundfish stocks, other than SNE cod.

The FY2025 prediction includes the management uncertainty buffer (MUB) in place for all groundfish stocks, and a separate prediction for the MUB removed for all stocks, other than SNE cod (Table 69). A third run, removing only the management uncertainty buffer for white hake, yielded similar results as the first run (MUB in place for all stocks) and therefore is not included in the summary tables.

When all MUBs are included, predicted groundfish revenue for FY2025 is $33.5M, representing a $8.2M (-20%) decrease from the FY2023 realized value of $41.7M. Total predicted gross revenues from groundfish trips for FY2025 is $49.1M. This represents a $12.5M decrease from the FY2023 realized value of $61.6M.

When MUBs are removed for all stocks other than SNE cod, predicted groundfish revenue for FY2025 is $34.7M, an increase of $1.2M compared to the inclusion of buffers. Total revenue from groundfish trips is $51.7M, an increase of $2.6M compared to the inclusion of buffers. However, even with the removal of MUBs for groundfish stocks, FY2025 predicted groundfish revenue is still $7.0M (17%) lower than the FY2023 value. Total revenue from groundfish trips is still $9.9M (16%) lower.

Of note, these predicted revenue decreases are largely influenced by the constraining WGOM cod stock. Table 70 and Table 71 show that this stock is predicted to be fully utilized, with or without the MUBs. A large portion of groundfish revenue has been generated from harvest that occurs within WGOM cod statistical areas in recent years. For example, over the 2019 – 2023 fishing years, 76% of groundfish revenue and 72% of total revenue from groundfish trips has been generated from these statistical areas. The model predicts that revenue from other groundfish stocks that primarily occur within WGOM cod statistical areas will be influenced by the constraining cod stock. For example, predicted pollock revenue is $1.1M lower than FY2023, predicted redfish revenue is $0.5M lower than FY2023, and predicted white hake revenue is $0.5M lower than FY2023 (Table 71). If the fishery is able to avoid cod to a greater extent than the model predicts, these predicted revenue losses for un-constraining stocks may be exaggerated. Outside of WGOM cod, GB haddock, white hake, and GB cod are also predicted to have high utilization rates.

Home port and trip port[38] results are presented in Table 72 and Table 73, respectively. The results between the two tables are generally similar with a few exceptions. Home port revenue is considerably higher for Portland, ME compared to landing port revenue. Conversely, landing port revenue is higher for Boston, MA compared to home port revenue. The removal of the MUBs has a positive impact on revenue across all major ports. This may suggest that the removal of the MUB buffer for WGOM cod (12.4mt) will provide some additional harvesting opportunities for all groundfish ports.

By vessel length (Table 74), all size classes are predicted to have higher groundfish revenues with the removal of the MUBs. The distribution of groundfish revenues during FY2025 are predicted to be 61% for vessels 75' and longer, 23% for vessels 50' to <75', and 16% for vessels <50' in length, with or without buffers in place. Similar to the port-level results, the vessel-size class results indicate that the impacts of FY2025 quota reductions will have profound impacts across the fishery.

Of note, behavioral changes in the fishery may occur due to the transition from two cod stocks to four for FY2025. For example, few trips occurred in the EGOM cod broadstock area during FY2023. With separate WGOM and EGOM cod quotas in FY2025, and the WGOM quota predicted to be highly constraining, there may be a shift in effort east. The QCM is largely unable to predict these sorts of potential large effort shifts as noted in the model assumptions listed under the methods section: "stock conditions, fishing practices and harvest technologies existing during the data period are representative".

Stocks with predicted high levels of utilization in FY2025 are expected to have higher quota prices relative to less utilized stocks. Stock-level quota prices and costs are summarized in Table 75. Quota costs represent the opportunity cost of quota where each pound of catch is multiplied by the estimated quota price. That is, every pound of fish caught can no longer be leased out. Quota accounting costs would look quite different as sectors/vessels will have varying needs to lease in quota, based in part on their initial allocations. The accuracy of FY2023 lease costs for FY2025 will vary considerably by stock. White hake had a high lease cost in FY2023 and this will likely continue for FY2025, given predicted utilization levels. On the other hand, GB haddock had no associated lease cost in FY2023; this will almost certainly not be the case for FY2025. Exploratory model runs assuming lease costs of $2/lb for GB haddock and $5/lb for WGOM cod predict further declines in revenue and increases in quota costs.

Overall, economic impacts to the sector fishery from either scenario (with or without MUB removal) under Alternative 2 are highly positive compared to Alternative 1/No Action, as under No Action there would be no sector fishing beginning May 1, 2025, without ACLs specified for the four Atlantic cod stocks. Relative to FY2023 and FY2024, economic impacts would be highly negative, given the decline in revenues predicted for FY2025 from realized revenues in FY2023 and predicted revenues for FY2024 (Table 69). The decline in revenue is predicted to be greater under the scenario with the MUBs in place and removing the MUBs (except for SNE cod) may help to offset some of the negative economic impacts.

[38] Trip port is primarily defined by the dealer port, and secondarily defined by the VTR port

Table 70 – Alternative 2 *(MUB in place for all stocks)* stock-level catch and revenue predictions, median values with 5% and 95% confidence intervals, nominal dollars (millions). Stocks are presented in order of FY2025 predicted ex-vessel value.

Stock	Sub-ACL (mt)	Predicted Catch (mt)	Predicted Utilization	FY25 Prediction	*p(5%) Revenue*	*p(95% Revenue)*	FY23 Realized Revenue
Pollock	10,598	2,950	27.8%	7.6	6.4	8.4	8.9
Redfish	7,782	3,313	42.6%	4.9	4	5.7	5.7
White Hake	1,798	1,476	82.1%	4.2	3.3	4.6	4.8
American Plaice	7,993	1,223	15.3%	3.9	3.1	4.4	4.3
GOM Haddock	2,032	1,241	61.1%	3.4	2.7	3.9	3.5
GB Haddock	1,408	1,279	90.9%	3.4	2.7	3.8	7.1
Witch Flounder	1,356	953	70.3%	2.7	2.1	3.1	3
WGOM Cod	236	235	99.9%	1	0.8	1.1	1.9
GB Winter Flounder	1,389	186	13.4%	0.9	0.5	1.4	1.0
CC/GOM Yellowtail Flounder	768	259	33.7%	0.4	0.3	0.4	0.4
GOM Winter Flounder	525	94	17.9%	0.3	0.3	0.4	0.4
Halibut	N/A	23	N/A	0.2	0.1	0.2	0.2
GB Cod	70	40	58.1%	0.2	0.1	0.2	0.3
SNE/MA Winter Flounder	388	11	2.8%	<0.1	<0.1	0.1	0.1
SNE Cod	4	1	21.4%	<0.1	<0.1	<0.1	<0.1
EGOM Cod	43	0	1.1%	<0.1	<0.1	<0.1	<0.1
GB Yellowtail Flounder	63	0	0.4%	<0.1	<0.1	<0.1	<0.1
SNE/MA Yellowtail Flounder	26	0	0.2%	<0.1	<0.1	<0.1	<0.1

Table 71 – Alternative 3 *(MUB removed for all stocks, other than SNE cod)* stock-level catch and revenue predictions, median values with 5% and 95% confidence intervals, nominal dollars (millions). Stocks are presented in order of FY2025 predicted ex-vessel value.

Stock	Sub-ACL (mt)	Predicted Catch (mt)	Predicted Utilization	FY25 Prediction	*p(5%) Revenue*	*p(95% Revenue)*	FY23 Realized Revenue
Pollock	11,155	2,991	26.8%	7.8	7.0	8.6	8.9
Redfish	8,192	3,473	42.4%	5.2	4.4	5.9	5.7
White Hake	1,893	1,524	80.5%	4.3	3.9	4.7	4.8
American Plaice	8,413	1,288	15.3%	4.1	3.7	4.6	4.3
GB Haddock	1,482	1,358	91.7%	3.6	3.1	4.1	7.1
GOM Haddock	2,139	1,263	59.1%	3.5	3.1	3.9	3.5
Witch Flounder	1,427	978	68.6%	2.8	2.5	3.1	3
WGOM Cod	248	248	99.9%	1.1	1.1	1.1	1.9
GB Winter Flounder	1,432	203	14.2%	1.0	0.6	1.5	1
CC/GOM Yellowtail Flounder	808	268	33.1%	0.4	0.3	0.4	0.4
GOM Winter Flounder	553	97	17.5%	0.4	0.3	0.4	0.4
GB Cod	73	53	72.0%	0.2	0.1	0.3	0.3
Halibut	N/A	25	N/A	0.2	0.2	0.2	0.2
SNE/MA Winter Flounder	408	13	3.1%	<0.1	<0.1	0.1	0.1
SNE Cod	4	1	27.7%	<0.1	<0.1	<0.1	<0.1
EGOM Cod	46	<1	0.7%	<0.1	<0.1	<0.1	<0.1
GB Yellowtail Flounder	65	<1	0.5%	<0.1	<0.1	<0.1	<0.1
SNE/MA Yellowtail Flounder	27	<1	0.2%	<0.1	<0.1	<0.1	<0.1

Table 72 – Alternative 2 groundfish revenue prediction by *home port*, mean values with 5% and 95% confidence intervals in parenthesis, nominal dollars (millions).

	MUB in place for all stocks		**MUB removed for all stocks, other than SNE cod**	
State/Port	Groundfish Revenue	Total Revenue	Groundfish Revenue	Total Revenue
Massachusetts				
Gloucester	10.9	14.3	11.2	14.9
	(9.0 - 12.3)	(12.0 - 16.3)	(9.9 - 12.4)	(13.4 - 16.4)
Boston/Scituate	4.5	6.2	4.8	6.5
	(3.5 - 5.4)	(4.7 - 7.3)	(4.0 - 5.6)	(5.6 - 7.4)
New Bedford	7.7	13.3	8.3	14.5
	(6.3 - 9.1)	(10.7 - 16.3)	(7.1 - 9.5)	(12.5 - 17.1)
Outer/Lower Cape	0.1	0.8	0.1	1.0
	(<0.1 - 0.1)	(0.5 - 1.6)	(<0.1 - 0.1)	(0.6 - 1.8)
Other MA ports	0.1	0.2	0.1	0.2
	(0.1 - 0.1)	(0.1 - 0.3)	(0.1 - 0.1)	(0.1 - 0.3)
Maine				
Portland	5.5	6.8	6.0	7.3
	(4.2 - 6.7)	(5.3 - 8.0)	(5.0 - 6.8)	(6.2 - 8.4)
Other ME ports	1.7	2.0	1.7	2.0
	(1.3 - 2.1)	(1.5 - 2.4)	(1.4 - 2.0)	(1.6 - 2.3)
Rhode Island (all)	0.2	1.5	0.2	1.9
	(0.1 - 0.4)	(0.7 - 3.9)	(0.1 - 0.4)	(0.9 - 4.2)
New Hampshire (all)	0.6	1.0	0.7	1.0
	(0.4 - 0.8)	(0.7 - 1.2)	(0.5 - 0.9)	(0.8 - 1.2)

Table 73 – Alternative 2 groundfish revenue prediction by *trip port*, mean values with 5% and 95% confidence intervals in parenthesis, nominal dollars (millions).

	MUB in place for all stocks		**MUB removed for all stocks, other than SNE cod**	
State/Port	Groundfish Revenue	Total Revenue	Groundfish Revenue	Total Revenue
Massachusetts				
Gloucester	10.0 (8.2 - 11.3)	13.7 (11.4 - 15.5)	10.4 (9.3 - 11.7)	14.4 (12.9 - 15.9)
Boston/Scituate	10.4 (8.6 - 11.8)	13.4 (11.2 - 15.1)	11.2 (9.9 - 12.5)	14.4 (12.8 - 16.0)
New Bedford	9.0 (7.6 - 10.3)	14.3 (11.8 - 17.2)	9.6 (8.3 - 10.9)	15.5 (13.5 - 18.1)
Outer/Lower Cape	0.1 (0.1 - 0.1)	1.5 (0.9 - 2.2)	0.1 (<0.1 - 0.1)	1.7 (1.2 - 2.6)
Other MA ports	0.1 (<0.1 - 0.1)	0.1 (<0.1 - 0.1)	0.1 (<0.1 - 0.1)	0.1 (0.1 - 0.1)
Maine				
Portland	2.5 (1.9 - 3.0)	3.0 (2.2 - 3.5)	2.5 (2.1 - 3.0)	3.0 (2.6 - 3.5)
Other ME ports	0.4 (0.3 - 0.6)	0.6 (0.5 - 0.8)	0.5 (0.3 - 0.6)	0.7 (0.5 - 0.8)
Rhode Island (all)	<0.1 (<0.1 - .1)	1.1 (0.5 - 3.3)	<0.1 (<0.1 - .1)	1.4 (0.7 - 3.6)
New Hampshire (all)	0.2 (0.2 - 0.3)	0.5 (0.3 - 0.6)	0.3 (0.2 - 0.4)	0.5 (0.4 - 0.6)

Table 74 – Alternative 2 groundfish species revenue and total revenue prediction by size class, mean values with 5% and 95% confidence intervals in parenthesis, nominal dollars (millions).

	MUB in place for all stocks		**MUB removed for all stocks, other than SNE cod**	
Vessel Length Category	Groundfish Revenue	Total Revenue	Groundfish Revenue	Total Revenue
75'+	19.9 (16.8 - 22.1)	27.5 (23.0 - 30.9)	21.1 (19.4 - 22.8)	29.5 (27.2 - 31.9)
50'to<75'	7.5 (6.2 - 8.4)	12.4 (9.8 - 14.9)	8.0 (7.0 - 8.9)	13.5 (11.5 - 16.1)
<50'	5.4 (4.3 - 6.3)	8.4 (6.4 - 10.0)	5.6 (4.9 - 6.4)	8.9 (7.9 - 10.7)

Table 75 – Stock-level landings (Alternative 2: MUB removed for all stocks, other than SNE cod), estimated quota prices, and quota costs. Stocks listed in order of predicted FY2025 revenue

Stock	Predicted Catch (lbs.)	FY2023 Estimated Quota Price	Quota Cost
Pollock	6,594,161	0.01	93,307
Redfish	7,657,533	0.03	245,347
White Hake	3,359,963	0.75	2,534,453
American Plaice	2,838,549	0.00	0
GB Haddock	2,994,426	0.00	0
GOM Haddock	2,785,028	0.35	985,287
Witch Flounder	2,157,018	0.17	376,788
WGOM Cod	546,423	1.26	686,925
GB Winter Flounder	446,900	0.00	0
CC/GOM Yellowtail Flounder	590,518	0.00	431
GOM Winter Flounder	213,776	0.01	2,095
GB Cod	116,192	0.49	57,330
Halibut	N/A	N/A	N/A
SNE/MA Winter Flounder	27,943	0.00	0
SNE Cod	2,445	0.49	1,206
EGOM Cod	733	1.26	921
GB Yellowtail Flounder	670	0.00	0
SNE/MA Yellowtail Flounder	126	0.00	0
Total	*30,332,403*		*4,984,092*

<u>*Commercial Groundfish Fishery - Common Pool*</u>

The four Atlantic cod stocks (WGOM cod, EGOM cod, GB cod, and SNE cod) would not have FY2026 ACLs specified under Alternative 1/No Action (WGOM cod, EGOM cod, GB cod, and SNE cod). For these stocks, there would be no specifications and therefore would have negative impacts on the common pool fishery under Alternative 1/No Action relative to Alternative 2. Therefore, Alternative 2 would have positive economic impacts on the common pool relative to No Action.

<u>*Recreational Groundfish Fishery*</u>

WGOM cod – Under Alternative 2, there would be a new WGOM cod sub-ACL for the recreational fishery. Relative to Alternative 1/No Action, the economic impacts of Alternative 2 would be positive since a catch limit would be allocated.

SNE cod - See Section 6.5.3.3.

6.5.3.3 Alternative 3 – Southern New England Cod Recreational Sub-ACL (*Preferred Alternative*)

6.5.3.3.1 Option 1 – No Action

Recreational Groundfish Fishery

Under Option 1/No Action, SNE cod would not have a specification for the recreational fishery. Relative to Option 2, the economic impacts of Option 1/No Action would be negative since a catch limit would not be allocated, which could lead to overages of the total ACL and further restrictions on access to fishing cod.

Commercial Groundfish Fishery

Under Option 1/No Action, SNE cod would not have a specification for the recreational fishery. Relative to Option 2, the economic impacts of Option 1/No Action would be negative since a catch limit would not be allocated, which could lead to overages of the total ACL thereby holding the commercial fishery responsible for paying back any overages in a subsequent year.

6.5.3.3.2 Option 2 – Develop Southern New England Cod Recreational Sub-ACL (*Preferred Option*)

Recreational Groundfish Fishery

Under Option 2, SNE cod would have a specification for the recreational fishery. Relative to Option 1/No Action, the economic impacts of Option 2 would be positive since a catch limit would be allocated, which would reduce the risk of an overage of the total ACL and hold the component of the fishery that caused an overage accountable.

Commercial Groundfish Fishery

Under Option 2, SNE cod would have a specification for the recreational fishery. The component of the fishery that caused an overage would be accountable. Relative to Option 1/No Action, the economic impacts of Option 2 would be positive since a catch limit would be allocated and would reduce the risk of an overage of the total ACL.

6.5.4 Action 4 – Commercial Fishery Management Measures – Atlantic Cod

6.5.4.1 Alternative 1 – Common Pool Accountability Measures for Cod Stocks (*Preferred Alternative*)

6.5.4.1.1 Option 1 – No Action

Under Option 1/No Action without common pool accountability measures that reflect the four new cod stock units, there is increased risk of common pool catches exceeding sub-ACLs. When compared to Options 2 and 3, Option 1/No Action could have negative economic impacts on the sector fishery and recreational fishery, but mixed (positive, negative, neutral) economic impacts on the common pool fishery.

6.5.4.1.2 Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closures Areas for Cod Stocks (*Preferred Option*)

Option 2 would adopt common pool trimester TAC distributions and trimester TAC closure areas for the four revised Atlantic cod stocks. Option 2 would reduce the risk of the common pool exceeding sub-ACLs for the four new cod stocks. When compared to Option 1/No Action, Option 2 could have positive economic impacts on the sector fishery and recreational fishery, but mixed (positive, negative, neutral) economic impacts on the common pool fishery. Using the most recent five years of data to determine the distribution could have positive economic impacts on the common pool fishery as it would be consistent with recent fishing effort. In addition, the updated trimester closure areas for the common pool may offer fishing opportunities outside of the closures for other groundfish stocks like haddock, pollock, and flatfish. On the other hand, having four cod stocks (rather than two cod stocks) could lead to more frequent common pool closures, which would have negative economic impacts on the common pool fishery.

6.5.4.1.3 Option 3 – Common Pool Baseline Trip Limits for Cod Stocks (*Preferred Option*)

Option 3 would establish baseline common pool trip limits for the revised Atlantic cod stock units. Option 3 would reduce the risk of the common pool exceeding sub-ACLs for the four new cod stocks. When compared to Option 1/No Action, Option 3 could have positive economic impacts on the sector fishery and recreational fishery, but mixed (positive, negative, neutral) economic impacts on the common pool fishery. Depending on the actual trip limits, these may be higher or lower than what common pool participants experienced in the past.

6.5.5 Action 5 - Recreational Fishery Management Measures – Atlantic Cod

6.5.5.1 Alternative 1 – Recreational Fishing Measures for Southern New England Cod (*Preferred Alternative*)

6.5.5.1.1 Option 1 – No Action

Under Option 1, the federal recreational fishery would not be restricted beyond a minimum fish size of 23 inches for SNE cod. Continuing to allow possession of SNE cod in the recreational fishery would result in positive recreational economic benefits in the short term. However, the concern of overfishing the stock is higher without possession limits. Long-term impacts could be negative if the ability of the SNE cod stock to recover is compromised by recreational landings, which would negatively impact the commercial and recreational fisheries.

Notably, the issues of discard mortality and noncompliance in the recreational fishery from a prohibition on landings means the long-term benefits of SNE cod to the recreational fishery are hard to project, no matter the regulations selected.

Overall, the recreational fishery economic impacts of Option 1 would be positive relative to Option 2 and the commercial fishery economic impacts of Option 1 would be negative relative to Option 2.

6.5.5.1.2 Option 2 – Recreational Fishing Measures for Southern New England Cod (*Preferred Option*)

Under Option 2, the federal recreational fishery would be prohibited from landing SNE cod. Current measures applying to the "old GB cod" consist of a five fish possession limit, a minimum fish size of 23 inches, and an open season May 1 – 31 and September 1 – April 30 (Table 57). The effect of this closure on the overall cod encounter rate is difficult to determine, as many anglers that catch cod are fishing for other species (e.g., tautog). The cod encounter rate would likely remain relatively unchanged for anglers targeting other species but would decline to some degree under a zero-possession limit for anglers that target cod. Anglers in the latter category would eliminate their targeting behavior but would still likely encounter cod while fishing for alternative species. The possibility also exists that anglers with strong preferences for cod could reduce or eliminate their fishing activity altogether, further reducing cod encounters. Ultimately, both anglers and for-hire businesses will incur some negative impacts because of an inability to catch cod. The exact magnitude of impacts is difficult to quantify but the severity will largely depend on how much value anglers place on cod fishing opportunities.

The preference to target certain species is a product of many factors. As cod has deep-rooted history in the recreational fishery, it is likely that some anglers will be turned away from fishing to a certain extent if cod fishing is not an option. Differences in state waters regulations and federal waters regulations could also impact anglers' choices. Bait and tackle shops, marinas, and other shore-side businesses would also incur losses if fewer anglers chose to participate.

In the short term, the concern of overfishing would be lower with the recreational fishery having zero-possession of cod. The long-term impacts of Option 2 are uncertain as recreational anglers will not be able to land SNE cod from federal waters where they previously could do so, but the foregone cod landings may, or may not, rebuild the stock. Long-term impacts could be positive if the ability of the SNE cod stock to recover is improved by restricting recreational landings, which would positively impact the commercial and recreational fisheries. The stock rebuilding potential of this option will likely also be mitigated by any differences in federal and state regulations, and noncompliance, though those illegally landing cod would be receiving the same benefits as under Option 1/No Action.

Overall, the recreational fishery economic impacts of Option 2 would be negative relative to Option 1 and the commercial fishery economic impacts of Option 2 would be positive relative to Option 1.

6.5.5.2 Alternative 2 - Regional Administrator Authority to Adjust Recreational Measures for Cod Stocks (*Preferred Alternative*)

6.5.5.2.1 Option 1 – No Action

For EGOM cod and GB cod, the Regional Administrator would not have an established regulatory process for adjusting recreational fishing measures. The Council could consider proposing changes to regulations through its actions. Option 1 would have neutral economic impacts on the commercial fishery and recreational fishery relative to Option 2.

6.5.5.2.2 Option 2 - Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod (*Preferred Option*)

As this process is administrative, Option 2 would have neutral economic impacts on the commercial fishery and recreational fishery relative to Option 1.

If the NMFS/Council consultation process includes consideration of the recommendations of the Recreational Advisory Panel, it could lead to positive social benefits for the recreational cod fishery participants in EGOM and GB with respect to the process of management decisions.

6.6 Impacts on Human Communities – Social

National Standard 8 (NS8) requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. FW59 provides an overview of types of social change.

Social Impact Factors. The social impact factors outlined below can be used to describe the Northeast multispecies (groundfish) fishery, its sociocultural and community context, and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007a) and other texts (e.g., Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. Qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts.

The social impact factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.
2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The *Social Structure and Organization;* that is, changes in the fishery's ability to provide necessary social support and services to families and communities, as well as effects on the community's social structure, politics, etc.
4. The *Non-Economic Social Aspects* of the fishery; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007a).

Data utilized to inform the social impact factors come from the latest available fishing community scientific information, including the 2004 – 2023 Groundfish-Specific Commercial Engagement Indicators, 2009 – 2020 Recreational Engagement Indicators, 2016 – 2020 Community Social Vulnerability Indicators (CSVI), and results from three waves (2012 – 2013, 2018 – 2019, and 2023 – 2024) of the Socio-Economic Surveys of Hired Captains and Crew in New England and Mid-Atlantic Commercial Fisheries (Crew Survey). More information about these data can be found under Section 5.7.7 of the Human Communities in the Affected Environment section, or at https://www.fisheries.noaa.gov/new-england-mid-atlantic/socioeconomics/northeast-socioeconomic-data-products.

6.6.1 Action 1 – Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

6.6.1.1 Alternative 1 – No Action

Alternative 1/No Action has no direct or indirect social impacts. Impacts are determined from the implementing measures in Actions 2 – 5.

6.6.1.2 Alternative 2 – Status Quo

Alternative 2 has no direct or indirect social impacts. Impacts are determined from the implementing measures in Actions 2 – 5.

6.6.1.3 Alternative 3 – Revise Atlantic Cod Stock Units in the FMP (*Preferred Alternative*)

Alternative 3 has no direct or indirect social impacts. Impacts are determined from the implementing measures in Actions 2 – 5.

6.6.2 Action 2 – Atlantic Cod Status Determination Criteria

6.6.2.1 Alternative 1 – No Action

Under Alternative 1/No Action, status determination criteria (SDC) would not be put into effect for the four new cod stocks. The setting of OFLs, ABCs, and ACLs depends upon there being SDCs that reflect the most recent available scientific information on the status of the stocks. Therefore, Alternative 1/No Action is anticipated to have negative social impacts relative to Alternative 2, particularly with respect to the *Attitudes, Beliefs, and Values* of fishing industry participants whose trust in science and management may be further eroded.

6.6.2.2 Alternative 2 – New Status Determination for Cod Stocks (*Preferred Alternative*)

Alternative 2 would set SDCs for the four new cod stocks, as would be consistent with National Standard 1 (NS1) guidelines to set overfishing and catch limits based upon the most recent available scientific information. Relative to No Action under Alternative 1, this alternative is anticipated to have positive social impacts, at least insofar as fishery industry participants in general would likely retain some level of trust in science and management to utilize the most recent scientific information to manage these stocks. However, the new SDCs might signal poor status of some (if not all) of these four stocks leading to further reductions in ACLs, which would exacerbate an already challenging circumstance with the status of Atlantic cod overall. If fishery participants do not have high confidence in the most recent scientific information, this might counteract any potential positive social impacts from setting the SDCs.

6.6.3 Action 3 – Revised Specifications for Atlantic Cod

6.6.3.1 Alternative 1 – No Action

Alternative 1 would take no action to provide revised specifications based on the latest assessment information. Without revised specifications, the four new Atlantic cod stocks would not have any specifications in place for FY2026 and given that they are new stocks to the FMP they do not have default specifications. Therefore, it is anticipated that Alternative 1/No Action would have wide ranging negative impacts across the various components of the fishery.

Commercial Groundfish Fishery

Negative social impacts resulting from Alternative 1/No Action would likely affect both the sector and common pool components of the commercial groundfish fishery. Groundfish sectors would not be able to operate in the broad stock areas without quota allocations, or annual catch entitlements (ACEs). All four new cod stocks would not have specifications under Alternative 1/No Action and this would negatively impact the common pool segment of the fishery as well.

Recreational Groundfish Fishery

Similar to the commercial fishery, the recreational groundfish fishery would likely see substantial negative social impacts resulting from the selection of Alternative 1/No Action when compared to Alternative 2. There would be no sub-ACLs set for the recreational fishery for SNE cod and WGOM cod.

6.6.3.2 Alternative 2 – Revised Specifications (*Preferred Alternative*)

When compared to Alternative 1/No Action, Alternative 2 is anticipated to have widespread positive social impacts to the commercial and recreational components of the groundfish fishery. This is mainly due to the fact that no specifications would be set under Alternative 1/No Action for the four new cod stocks and therefore fishing opportunities would be dramatically reduced or prohibited altogether without sub-ACLs for these stocks. However, Alternative 2 is anticipated to bring negative social impacts when compared to past years given the dramatic cuts to quotas based on new assessments, the division of cod into four new stocks, and other reductions in sub-ACLs for multiple stocks.

Commercial Groundfish Fishery

The social impacts of Alternative 2 on the entire commercial groundfish fishery are anticipated to be highly negative in FY2026 when compared to the two most recent years for which we have complete data, FY2023 and FY2024. For the sector component of the fishery, specifically, revenues are predicted to substantially decline in FY2025 relative to the actual and predicted revenues of FY2023 and FY2024, respectively. According to the QCM results (see section 6.5.3.2), FY2025 groundfish revenue is predicted to be at least \$7 million lower than FY2023 with MUBs removed but could be at least \$12.5 million lower than FY2023 with MUBs included in the model prediction. Multiple factors are responsible for the predicted decreases in revenue, including the highly constraining WGOM cod stock, large cuts to GB haddock sub-ACL, and the predicted high utilization of white hake, GB cod, and GB haddock stocks.

While these impacts are anticipated to be widespread and will likely affect commercial fishery participants across the region, several ports in particular may see disproportionately high negative impacts based on community social vulnerabilities present in those places. According to the latest available 2020 CSVIs (see Table 37), New Bedford and Boston, MA, and Portland, ME, had medium to medium-high poverty. New Bedford and Boston, MA also had medium to medium-high vulnerability concerns related to population composition and personal disruption. These indices are key measures that comprise the suite of indicators designed to consider community impacts. The substantial social impacts resulting from Alternative 2 and the associated decreases in revenues from groundfish could be disproportionately distributed among vulnerable populations in these three New England communities. However, negative social impacts will very likely extend to many groundfish industry participants and community members in the other highly engaged ports in the region, including Gloucester, Chatham, and Scituate, MA; Narragansett, RI; Montauk and Hampton Bays/Shinnecock, NY; and Cape May, NJ (see Figure 10).

Alternative 2 is anticipated to have substantial individual-level impacts on commercial fishing vessel crews and hired captains due to the predicted decrease in groundfish revenue in FY2025. According to the latest 2023 – 2024 Crew Survey results, the average age of commercial crews and hired captains across the entire Northeast region was about 40. While the average did not change from 2018-19, there was a 6% decrease in crews aged 35 or younger and a 3% increase among those aged 55 or older (see Table 40). Taken together, these results provide evidence of the ongoing "graying" or aging of the fleet, which means fewer young adults are considering commercial fishing for employment. Vessel owners and captains have expressed difficulty finding reliable crew throughout the past two waves (2018 –2019 and 2023 – 2024) of Crew Survey fieldwork. The reductions in groundfish revenues under Alternative 2 will likely further reduce opportunities for young adults to enter the industry and for commercial captains and vessel owners to attract reliable, young, and new crew members to employ on their vessels.

Beyond the impacts to the size and demographic characteristics of the commercial groundfish fishery, Alternative 2 is anticipated to have negative social impacts with respect to the attitudes, beliefs, and values of the commercial industry participants in the fishery. According to the latest available 2023-24 Crew Survey results, about 77% of crews and hired captains reported that the regulations of their primary fishery change too quickly and 70% reported the regulations were too restrictive (see Table 42). Given the size and immediacy of the decrease collectively across the sub-ACLs for the cod stocks, it is likely that Alternative 2 will not improve attitudes towards management among fishery participants. This will likely be exacerbated by industry participants' perceptions of inadequacies or flaws in recent stock assessments that comprise the latest and best available scientific information underpinning the proposed changes.

Recreational Groundfish Fishery

Alternative 2 is anticipated to have positive social impacts to recreational fishery participants and community members relative to Alternative 1/No Action. Under Alternative 2, the recreational fishery will gain allocations of WGOM cod and SNE cod. Although Mid-Atlantic region communities generally have higher recreational fishery engagement (see Figure 10), several recreational fishing communities in New England could benefit from these positive impacts of Alternative 2 relative to Alternative 1/No Action. Those communities include Narragansett/Point Judith, RI; Newburyport, Barnstable, and Gloucester, MA; and Waterford, East/Lyme/Niantic, and Old Saybrook, CT (see section 5.7.7.1.2).

6.6.3.3 Alternative 3 – Southern New England Cod Recreational Sub-ACL (*Preferred Alternative*)

6.6.3.3.1 Option 1 – No Action

Recreational Groundfish Fishery

Under Option 1/No Action, there would be no specification for SNE cod and no catch limit allocated to the recreational fishery, likely leading to overages of the overall ACL and measures to restrict fishing to prevent further cod catches by the recreational fishery. This would result in negative social impacts relative to Option 2 under Alternative 3, which would allocate a sub-ACL to the recreational fishery.

Commercial Groundfish Fishery

Option 1/No Action is anticipated to have negative social impacts on the commercial fishery relative to Option 2 under Alternative 3. There would be no SNE cod allocation to the recreational fishery which constitutes a larger proportion of the total catch, which in turn could lead to overages on the total ACL, and required pay back in future years by the commercial fishery.

6.6.3.3.2 Option 2 – Develop Southern New England Cod Recreational Sub-ACL (*Preferred Option*)

Recreational Groundfish Fishery

Option 2 under Alternative 3 is anticipated to have positive social impacts on the recreational fishery relative to Option 1/No Action. Option 2 would provide a sub-ACL for SNE cod to the recreational fishery, thereby potentially preventing an overage of the total ACL.

Commercial Groundfish Fishery

Option 2 under Alternative 3 is anticipated to have positive social impacts on the commercial fishery relative to Option 1/No Action. Option 2 would provide a sub-ACL for SNE cod to the recreational fishery, thereby potentially preventing a commercial fishery payback as a result of an overage of the total ACL produced by the recreational fishery.

6.6.4 Action 4 – Commercial Fishery Management Measures – Atlantic Cod

6.6.4.1 Alternative 1 – Common Pool Accountability Measures for Cod Stocks (*Preferred Alternative*)

6.6.4.1.1 Option 1 – No Action

Option 1/No Action could lead to negative social impacts on the commercial groundfish sectors and recreational portions of the fishery relative to Options 2 and 3. Under Option 1/No Action, there would be no common pool AMs for the four new cod stocks and the common pool segment of the fishery could exceed sub-ACLs and reduce opportunities for other segments of the fishery. However, the common pool fishery could see a range of outcomes from neutral to positive relative to Options 2 and 3.

6.6.4.1.2 Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closures Areas for Cod Stocks (*Preferred Option*)

Option 2 is anticipated to have neutral to positive social impacts on the commercial groundfish sectors and recreational portions of the fishery relative to Option 1/No Action. Under Option 2, there would be common pool trimester TAC distributions and trimester TAC closure areas for the four revised Atlantic cod stocks. These AMs would be in place in order to reduce the likelihood of the common pool fishery exceeding its sub-ACLs of the new cod stock classifications. Although this could presumably benefit the commercial and recreational portions of the fishery, Option 2 may have negative social impacts on common pool participants such that it may reduce opportunities to fish as a result of any common pool closures.

6.6.4.1.3 Option 3 – Common Pool Baseline Trip Limits for Cod Stocks (*Preferred Option*)

Option 3 is anticipated to have neutral to positive impacts on the commercial groundfish sectors and recreational portions of the fishery but could have neutral to negative impacts on common pool participants. Option 3 would put into effect baseline common pool trip limits for each of the four new cod stocks. These measures could reduce the risk of the common pool exceeding its sub-ACLs for the new stocks, which could benefit commercial groundfish sectors and recreational fishery participants. However, Option 3 could have negative impacts on the common pool fishery if the new baseline trip limits lead to overages and closures or restrictions.

6.6.5 Action 5 - Recreational Fishery Management Measures – Atlantic Cod

6.6.5.1 Alternative 1 – Recreational Fishing Measures for Southern New England Cod (*Preferred Alternative*)

6.6.5.1.1 Option 1 – No Action

Under Option 1/No Action, the recreational fishery would not be subjected to a zero-possession limit for SNE cod. This would likely be beneficial to the recreational fishery in the short term but could have negative impacts in the long term and negative impacts for the commercial fishery should the recreational fishery contribute to overfishing of the SNE cod stock.

6.6.5.1.2 Option 2 – Recreational Fishing Measures For Southern New England Cod (*Preferred Option*)

Option 2 would put into place a zero-possession limit on SNE cod for the recreational fishery. This is anticipated to have neutral to negative impacts on the recreational fishery in the short term, but possibly positive impacts in the long term and possibly neutral to positive impacts on the commercial fishery. While a zero-possession limit on SNE cod would have some degree of negative impact on those recreational anglers and businesses that target the stock, it is also difficult to estimate to what extent this zero possession limit would affect recreational fishers targeting other species or stocks because encounters with SNE cod are difficult to determine (see section 6.5.5.1.2). Assuming the zero-possession limit reduces the risk of overfishing overall, then Option 2 would likely have positive impacts on the commercial segment of the fishery and positive impacts for the recreational fishery in the long term.

6.6.5.2 Alternative 2 - Regional Administrator Authority to Adjust Recreational Measures for Cod Stocks (*Preferred Alternative*)

6.6.5.2.1 Option 1 – No Action

Option 1/No Action would take no action to establish any process for the RA to adjust recreational measures for two cod stocks, EGOM and GB cod. This is anticipated to have neutral to low negative impacts to the recreational fishery relative to Option 2, and neutral impacts to the commercial fishery overall.

6.6.5.2.2 Option 2 - Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod (*Preferred Option*)

Option 2 would set up a regulatory process for the RA to adjust recreational cod measures for EGOM cod and GB cod, in consultation with the Council. This is in addition to the authority to adjust recreational measures for stocks with recreational sub-ACLs. This could lead to neutral to low positive impacts to the recreational fishery, with positive impacts derived from the possibility that the Recreational Advisors could have some degree of influence in decision-making by the agency. Option 2 is anticipated to have neutral impacts relative to Option 1/No Action on the commercial fishery.

6.7 CUMULATIVE EFFECTS

6.7.1 Introduction

The purpose of the cumulative effects assessment (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 Northeast multispecies (groundfish) 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.

Valued Ecosystem Components (VEC)

The valued ecosystem components for the groundfish fishery are generally the "place" where the impacts of management actions occur, and are identified as noted in Section 1.0:

1. Regulated groundfish stocks (target and non-target);
2. Non-groundfish species (incidental catch and bycatch);
3. Protected species (ESA-listed and/or MMPA-protected);
4. Habitat, including non-fishing effects; and
5. Human Communities (including economic and social effects on the fishery and fishing communities).

The CEA identifies and characterizes the impact on the VECs by the alternatives under consideration when analyzed in the context of other past, present, and reasonably foreseeable future actions. To enhance clarity and maintain consistency, terms are as defined in Table 60.

Temporal Scope of the VECs

While the effects of historical fisheries are considered, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. 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, rather than foreign fleets. For ESA-listed and MMPA-protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. For future actions, this analysis examines the period between the expected implementation of this action (May 2026) and 2031.

Geographic Scope of the VECs

The geographic scope of the analysis of impacts to regulated groundfish stocks, non-groundfish species and habitat for this action is the total range of these VECs in the Western Atlantic Ocean, as described in the Affected Environment section of the document (Section 5.0). However, the analyses of impacts presented in this framework focus primarily on actions related to the harvest of the managed resources. The result is a more limited geographic area used to define the core geographic scope within which the majority of harvest effort for the managed resources occurs. For ESA-listed and MMPA-protected species, the geographic range is the total range of each species (Section 5.6).

Because the potential exists for far-reaching sociological or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure sociological and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the groundfish fishery (Section 5.7.7) from the U.S.-Canada border to, and including, North Carolina.

Analysis of Total Cumulative Effects

A cumulative effects assessment ideally makes effect determinations based on the combination of: 1) impacts from past, present and reasonably foreseeable future actions; 2) the baseline condition 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 groundfish fishery are generally the "place" where the impacts of management actions occur, and are identified in Section 1.0.

- *Regulated groundfish stocks (target and non-target);*
- *Non-groundfish species (incidental catch and bycatch);*
- *Protected species (ESA-listed and/or MMPA protected);*
- *Habitat, including non-fishing effects; and*
- *Human Communities (including economic and social effects on the fishery and fishing communities).*

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 Temporal Boundaries

Overall, while the effects of the historical groundfish fishery are important and considered in the analysis, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species and other fisheries, the physical environment and EFH, and human communities is primarily focused on actions that occurred after FMP implementation (1977). 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 (2026-2031) into the future beyond the implementation of this action. The dynamic nature of resource management for these species 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 Section 6.7.4 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.

6.7.1.3 Geographic Boundaries

The analysis of impacts focuses on actions related to the commercial and recreational harvest of regulated groundfish. The Western Atlantic Ocean is the core geographic scope for each of the VECs. The core geographic scope for the managed species is the management unit (Section 5.5). For non-groundfish species, that range may be expanded and would depend on the range of each species in the Western Atlantic Ocean. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by regulated groundfish, and non-groundfish species in the Western Atlantic Ocean. The core geographic scope for protected species is their range in the Western Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities from the U.S.-Canada border to, and including, North Carolina directly involved in the harvest or processing of regulated groundfish (Section 5.7.7).

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 this 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 **Managed Resources (Regulated Groundfish)**

Past, present, and reasonably foreseeable future actions for regulated groundfish 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: Groundfish stocks were managed under the MSA beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan relied on hard quotas (total allowable catches, or TACs), and proved unworkable. The quota system was terminated in 1982 with the adoption of the Interim Groundfish Plan, which used minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank to control fishing mortality. The interim plan was replaced by the Northeast Multispecies FMP in 1986, which established biological targets in terms of maximum spawning potential and continued to rely on gear restrictions and minimum mesh size to control fishing mortality. A detailed discussion of the history of the FMP up to 2009 can be found in Amendment 16 (NEFMC 2009b).

Amendment 16, which became effective on May 1, 2010, adopted a broad suite of management measures in order to achieve the fishing mortality targets necessary to rebuild overfished stocks and meet other requirements of the MSA. Amendment 16 made major changes to the FMP. It greatly expanded the sector management program and adopted a process for setting ACLs to be set in biennial specifications packages. The Amendment adopted a system of ACLs and AMs that are designed to ensure catches remain below desired targets for each stock in the management complex. There were a host of mortality reduction measures for "common pool" (i.e. non-sector) vessels and the recreational component of the fishery. In 2011, the Council also approved Amendment 17, which allowed for NOAA-sponsored state-operated permit banks to function within the structure of Amendment 16.

There have been many framework adjustments that have updated the measures in Amendment 16. A subset is described below.

Framework 45 (May 1, 2011) adopted further modifications to the sector program and fishery specifications. Framework 47 (May 1, 2012) set specifications for some groundfish stocks for FY 2012 – 2014, modified AMs for the groundfish fishery and the administration of the scallop fishery AMs, and revised common pool management measures; modification of the Ruhle trawl definition and clarification of regulations for charter/party and recreational groundfish vessels fishing in groundfish closed areas were proposed under the RA authority.

Framework 48 (May 1, 2013) revised status determination criteria for several stocks, modified the sub-ACL system, adjusted monitoring measures for the groundfish fishery, and changed several AMs. Framework 49 (May 20, 2013) is a joint Northeast Multispecies/Atlantic Sea Scallop action that modified the dates for scallop vessel access to the year-round groundfish closed areas.

Framework 51 (May 1, 2014) modified rebuilding programs for GOM cod and American plaice, set specifications for FY2014-2016, and modified management measures in order to ensure that overfishing does not occur including additional management measures related to U.S./Canada shared stocks and yellowtail flounder in the groundfish and scallop fisheries. Framework 53 (May 1, 2015) updated status determination criteria, set specifications for FY2015-2017, adopted U.S./Canada TACs, established management measures for GOM cod that revise rolling closures and possession limits to enable GOM cod protection while providing the opportunity for the groundfish fishery to prosecute healthy stocks in other times and areas, implemented default specifications, and revised regulations governing Sector Annual Catch Entitlement (ACE) carryover. Monkfish FW9 was a joint action with the groundfish plan (FW54), and modified regulations for vessels in the days-at-sea (DAS) program.

Framework 55 incorporated stock status changes for groundfish stocks, set specifications for all groundfish stocks for FY2017-2019, adopted an additional sector and modified the sector approval process, modified the definition of a haddock separator trawl so that the separator panel is easily identifiable, made changes to the groundfish monitoring program and to the management measures for U.S./Canada TACs in order to move GB cod quota from the eastern management area to the western management area, and modified the Gulf of Maine Cod Protection Measures so that the recreational possession limit for GOM cod can once again be modified by the Regional Administrator.

Amendment 18, which became effective on May 1 and May 22, 2017, addressed fleet diversity and accumulation limits.

Framework 59 (July 20, 2020) revised the allocation between commercial and recreational fisheries for GOM cod and GOM haddock based on new data from the Marine Recreational Information Program (MRIP), along with setting specifications for some groundfish stocks for FY2020-2022, and several other minor changes to management measures.

Framework 61 (July 25, 2021) established a universal sector exemption for redfish, set specifications for roughly half of the groundfish stocks for FY2021-2023 and revised the rebuilding plan for white hake.

Framework 63 (July 15, 2022) modified recreational fishery management measures for GB cod, revised the default specifications process, and set specifications for several groundfish stocks for FY2022-2024.

Amendment 23, which became effective on December 15, 2022 and January 9, 2023, addressed improvements to the groundfish monitoring program.

Framework 65 (August 18, 2023) revised the rebuilding plan for GOM cod, set specifications for many groundfish stocks for FY2023-2025 including a GB cod catch target for the recreational fishery, temporarily removed the sector management uncertainty buffer for GOM haddock and white hake, and temporarily modified commercial accountability measures for GB cod.

Framework 66 (May 2, 2024) set specifications for several groundfish stocks for FY2024-2025, modified the trigger for implementing accountability measures for Atlantic halibut for commercial fisheries, and temporarily modified the accountability measure implementation policy for Atlantic sea scallops for the GB yellowtail flounder stock.

Reasonably Foreseeable Future Actions: The Council took final action on Framework 69 in December 2024. This framework action set specifications for several groundfish stocks for fishing years 2025-2027, U.S./Canada TACs for 2025, incorporate revisions to scallop fishery flatfish AM triggers. The Council included in Framework 69 status determination criteria and specifications for FY2025-FY2027 for the revised cod stock units, and measures to address Phase 1 of the Atlantic Cod Management Transition Plan, but those measures have been repackaged into this action, revised Amendment 25.

In addition to the actions to adjust measures from Amendment 16, the Council is also developing Framework Adjustment 68 which aims to modify and/or replace the existing acceptable biological catch (ABC) control rule that is applied in the context of setting groundfish ABCs. The goal of this action is to modify/replace the existing groundfish ABC control rules with a tiered groundfish control rule that enables consideration for increasing uncertainty/variability in stock assessments, stock status, including unknown and rebuilt, changes in environmental conditions, productivity regimes, climate-resilient management objectives, and National Standard Guidelines. The new control rule would produce catch advice that prevents overfishing, rebuilds stocks, improves attainment of optimum yield, and seeks to minimize large changes in catch advice as appropriate. The development is ongoing and will be in coordination with the Council's Risk Policy Working Group.

6.7.2.1.2 Non-target Species (Non-groundfish)

There are Management Plans in place for non-target, non-groundfish species, including the Skate FMP, Herring FMP (jointly managed with ASMFC), Scallop FMP, Summer Flounder, Black Sea Bass, and Scup FMP (managed by the MAFMC), Monkfish FMP (jointly managed with the MAFMC), and Spiny Dogfish FMP (jointly managed with the MAFMC).

6.7.2.1.3 Physical Habitat/EFH

The EFH Omnibus Amendment 2 (Groundfish A14), effective April 2018, reviewed and updated EFH designations, identified Habitat Areas of Particular Concern (HAPC), 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, June 2020, Groundfish FW60) that designated three exemption areas within the Great South Channel Habitat Management Area where clam and mussel dredges are allowed. The deep-sea coral amendment Groundfish A24, effective June 2021, was developed to protect deep-sea coral habitats throughout New England from the negative impacts of fishing gears. The amendment designated the Georges Bank Deep-Sea Coral Protection Zone between the U.S./Canada EEZ boundary, the boundary between the NEFMC and MAFMC regions, and the seaward boundary of the U.S. EEZ, with the landward boundary at the 600 m contour. The zone is a closure to all bottom-tending gears, with an exemption for the red crab pot fishery. Two mobile bottom-tending gear closures were also implemented in federal waters in eastern Maine. The Council also developed an action to establish an HAPC in Southern New England (Groundfish FW64). Measures included designating cod spawning and complex HAPCs that overlap with wind energy areas in Southern New England.

6.7.2.1.4 Protected Resources

Past and Present Actions: NMFS has implemented specific actions to reduce injury and mortality of protected species from gear interactions.

NMFS developed an Atlantic trawl gear take reduction strategy (Strategy) to reduce the incidental capture of small cetaceans; the measures identified in the Strategy are voluntary for trawl fisheries. In addition, NMFS has implemented regulations pursuant to the Harbor Porpoise Take Reduction Plan (HPTRP), and Bottlenose Dolphin Take Reduction Plan (BDTRP), and Atlantic Large Whale Take Reduction Plan (ALWTRP). Under the HPTRP and BDTRP, regulations were implemented to reduce serious injury or mortality of harbor porpoise in commercial gillnet fisheries, or bottlenose dolphins in mid-Atlantic coastal gillnet fishery and eight other coastal fisheries operating within the dolphin's distributional range, respectively. Regulations under the ALWTRP were implemented to reduce serious injury and mortality of large whale species in commercial fixed gear (i.e., trap/pot and gillnet) fisheries; see Section 5.6.4.2.5.1 for additional information on the Plan.

On May 27, 2021, the NMFS completed formal consultation pursuant to section 7 of the ESA of 1973, as amended, and issued a biological opinion (2021 Opinion) on the authorization of eight FMPs, two interstate fishery management plans (ISFMP), and the implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2. On September 13, 2023, NMFS issued a 7(a)(2)/7(d) memorandum that reinitiated consultation on the 2021 Biological Opinion; this memorandum was replaced with an updated 7(a)(2)/7(d) memorandum issued by NMFS on January 8, 2025. Additional information on the reinitiation is provided in section 5.6.4.2.5.1.

On September 26, 2022, NOAA Fisheries released a final Action Plan to reduce Atlantic sturgeon bycatch in Federal large mesh gillnet fisheries. Based on an extensive literature review, the Action Plan provides a suite of recommendations to NOAA Fisheries, the New England Fishery Management Council, and the Mid-Atlantic Fishery Management Council that should be considered, refined, and implemented in order to reduce Atlantic sturgeon bycatch in subject fisheries by 2024. As discussed further in the *"Other Fishery Management Actions"* section below, the Councils developed a related action in 2023 to reduce Atlantic sturgeon bycatch in monkfish and spiny dogfish fisheries; final action occurred in April 2024, and the final rule was issued December 2024.

In 2022, NOAA Fisheries held various forums to gather information from the public, fishing industry, and other stakeholder groups to inform any future measures for reducing sea turtle bycatch in trawl fisheries. Potential considerations to reduce sea turtle bycatch included ideas such as geographically extending the requirement of TEDs northward, other gear modifications, or reduced tow times. Although no action has been taken by NMFS to date, the agency continues to seek input on various informational needs identified at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/endangered-species-conservation/sea-turtle-bycatch-reduction-trawl.

Reasonably Foreseeable Future Actions: Currently, NMFS is working to amend the ALWTRP to reduce the risk of mortalities and serious injuries of North Atlantic right, fin, and humpback whales in all U.S. East Coast commercial fisheries regulated under the ALWTRP. On August 11, 2021, NMFS issued a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) to analyze the impacts to the environment of alternatives to amend the Plan for non-lobster trap/pot and gillnet fisheries regulated under the ALWTRP (86 FR 43996). The NOI also informed the public of upcoming scoping meetings to solicit public input. A second NOI to prepare an EIS published on September 9, 2022 that added lobster and Jonah crab trap/pot fisheries to the list of fisheries being analyzed in future amendments (87 FR 55405). These efforts to modify the Plan are still ongoing.

On July 19, 2023, NMFS issued a proposed rule to designate new areas of critical habitat and modify existing critical habitat for threatened and endangered distinct population segments (DPSs) of the green sea turtle, in areas under U.S. jurisdiction, pursuant to the ESA (88 FR 46572). The comment period on the proposed rule closed on October 17, 2023; rule making is currently ongoing.

These above measures, whether proposed or final, would likely have some degree of positive impacts on these protected species by reducing the number of interactions with fishing gear, and therefore, reducing the risk of injury and mortality to these protected species and/or adversely affecting habitat.

6.7.2.1.5 **Human Communities**

All actions taken under the Northeast Multispecies FMP have had effects on human communities. Many actions have included specific measures designed to improve flexibility and increase efficiency. Amendment 18 addressed fleet diversity and accumulation limits. Amendment 23 adjusted the groundfish monitoring program, including establishing target coverage levels up to 100 percent, and is expected to have distributional impacts on individuals and ports participating in the fishery.

6.7.2.1.6 **Other Fishery Management Actions**

In addition to the Northeast Multispecies FMP, there are many 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.

The New England Fishery Management Council and Mid-Atlantic Fishery Management Council developed a joint action to reduce bycatch of Atlantic sturgeon in the large-mesh gillnet fisheries for monkfish and spiny dogfish. The Councils took final action in April 2024, and the final rule was published in December 2024. This action establishes area-based gear requirements for vessels fishing with gillnets in the monkfish fishery, starting on January 1, 2026, and for vessels fishing with gillnets in the spiny dogfish fishery starting on May 1, 2025. This action aims to minimize bycatch of Atlantic sturgeon in the monkfish and spiny dogfish fisheries to the extent practicable and fulfill requirements of the Biological Opinion on Ten Fishery Management Plans in the Greater Atlantic Region and the New England Fishery Management Council's Omnibus Habitat Amendment 2.

6.7.2.1.7 Fishery Management Action Summary

The Council has taken many actions to manage the associated commercial fisheries in its jurisdiction. Actions taken in other FMPs, and some Omnibus Actions are described in Section 6.7.2.1. 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 constrain fishing effort and manage stocks at sustainable levels. Constraining fishing effort through regulatory actions can have negative short-term socioeconomic impacts. These impacts are sometimes necessary to bring about long-term sustainability of a resource, and as such should promote positive effects on human communities in the long-term. A summary of the cumulative impacts of past, present, and reasonably foreseeable future actions on each VEC is provided in Table 76.

Table 76 – Summary effects of past, present, and reasonably foreseeable future actions on the VECs identified for Amendment 25.

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Regulated Groundfish Stocks	**Mixed** Combined effects of past actions have decreased effort, improved habitat protection, and implemented rebuilding plans when necessary. However, some stocks remain overfished	**Positive** Current regulations continue to manage for sustainable stocks	**Positive** Future actions are anticipated to continue rebuilding and strive to maintain sustainable stocks	**Short-term Negative** Several stocks are currently overfished, have overfishing occurring, or both **Long-Term Positive** Stocks are being managed to attain rebuilt status
Non-Groundfish Species	**Positive** Combined effects of past actions have decreased effort and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species	**Positive** Future actions are anticipated to continue rebuilding and target healthy stocks, thus limiting the take of discards/bycatch	**Positive** Continued management of directed stocks will also control incidental catch/bycatch
Endangered and Other Protected Species	**Slight Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Slight Positive** Current regulations continue to control effort, thus reducing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but as stocks improve, effort will likely increase, possibly increasing interactions	**Mixed** Continued catch and effort controls are likely to reduce gear encounters through effort reductions. As stocks improve, effort may increase, possibly increasing interactions. Additional management actions taken under the HPTRP, BDTRP, and ALWTRP should also help mitigate the risk of gear interaction.
Habitat	**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive, but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Human Communities	**Mixed** Fishery resources have supported profitable industries and communities but increasing effort and catch limit controls have curtailed fishing opportunities	**Mixed** Fishery resources continue to support communities but increasing effort and catch limit controls combined with non-fishing impacts such as high fuel costs have had a negative economic impact	**Short-term Negative** As effort controls are maintained or strengthened, economic impacts will be negative **Long-term Positive** As stocks improve, effort will likely increase which would have a positive impact	**Short-term Negative** Revenues would likely decline dramatically in the short term and may remain low until stocks are fully rebuilt **Long-term Positive** Sustainable resources should support viable communities and economies

Impact Definitions:
-Regulated Groundfish Stocks, Non-groundfish species, Endangered and Other Protected Species: positive=actions that increase stock size and negative=actions that decrease stock size
-Habitat: positive=actions that improve habitat or reduce disturbance of habitat and negative=actions that degrade or increase disturbance of habitat
-Human Communities: positive=actions that increase revenue and well-being of fishermen and/or associated businesses and negative=actions that decrease revenue and well-being of fishermen and/or associated businesses

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)[39], which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

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[39] "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

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, inter-array 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, though offshore wind contracts can be negotiated for up to 30 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 (target burial depth is typically 4-6 feet) 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. The cable burial process may also alter sediment composition 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 (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).

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape[40]. 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

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likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat."

[40] NMFS Ocean Noise Strategy Roadmap

(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). 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) (Forney et al. 2017; Richardson et al. 1995; Slabbekoorn et al. 2010; Thomsen et al. 2006). 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)[41] (Association 2020).

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[42] 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[43] and NEFSC developed draft Fisheries Survey Mitigation Plans in spring of 2024[44], with an implementation plan expected soon.

Impacts of Offshore Wind Energy Development on Socioeconomic Resources

Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Maine to North Carolina (Map 4). 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).

Offshore wind energy development is well underway within the lease areas off Rhode Island and Massachusetts. The groundfish fishery has been active in the Massachusetts/Rhode Island lease areas and is expected to be for the near future (Map 5). As of December 2024, South Fork Wind (12 turbines) is now commissioned and operational and Vineyard Wind 1 (62 turbines) is nearing completion (the project is experiencing delays due to a blade failure that occurred in summer 2024). Revolution Wind was permitted by BOEM during 2023 and construction is well under way and is expected to be in operation in 2026. Sunrise Wind (project off Rhode Island with power brought to shore in New York) began construction in summer 2024 and is expected to be in operation in 2026. In December 2024, BOEM announced the approval of the SouthCoast Wind project; construction is expected to begin in 2025. Other

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41 NMFS Ocean Noise Strategy Roadmap

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

43 Hare et al. 2022. NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy - Northeast U.S. Region. https://doi.org/10.25923/jqse-x746

44 Draft NEFSC Fisheries Survey Mitigation Plans: https://www.fisheries.noaa.gov/event/peer-review-draft-nefsc-fisheries-survey-mitigation-plans

projects in Southern New England that are earlier in the site assessment and planning phases include: New England Wind 1 and 2, Beacon Wind, and Vineyard Northeast. In 2023, the Council developed a Habitat Area of Particular Concern (HAPC) overlapping the Southern New England lease areas in order to promote conservation of cod spawning grounds and complex benthic habitats. A final rule on this measure was published in February 2024[45].

Further south in the Mid-Atlantic region, beyond the footprint of the groundfish fishery and most groundfish species, there are many other offshore wind energy leases and planning areas. In August 2024, the first two 'Central Atlantic' lease areas were auctioned off Delaware/Maryland and Virginia and BOEM is currently undertaking a second round of wind energy area (WEA) identification for subsequent leasing in the Central Atlantic.

BOEM began a planning process for the Gulf of Maine via a regional intergovernmental renewable energy task force (https://www.boem.gov/Gulf-of-Maine). In October 2024, the Department of the Interior announced the provisional winners on four lease areas in the Gulf of Maine, including three off Massachusetts and one off Maine (there were eight offshore wind energy lease areas available as part of the auction). These offshore wind leases are expected to be executed to the two auction winners in December 2024. Given the water depth in the region, floating turbines will likely be the primary type of wind turbine foundations to be deployed. The Gulf of Maine final lease areas overlap with groundfish fishing areas and the redfish sector exemption area, though do not overlap the redfish exemption area cod closure nor the redfish exemption area seasonal closure II. In addition, Pine Tree Offshore Wind LLC, in partnership with the State of Maine, holds a research lease in the Gulf of Maine southeast of Portland.

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 groundfish fishing grounds. Impacts may vary by year based on species availability. It remains unclear exactly how fishing or transiting to and from fishing grounds 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.[46] Floating wind farms are likely to cause greater displacement of fishing activity as compared to fixed turbines given the presence of floating inter-array cables and anchoring systems. If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative socioeconomic impacts to affected communities, including increased user conflicts, decreased catch and associated revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind farms, the effects could be both positive due to potential increased recreational catch and negative due to reduced commercial fishery catch and associated revenue, user conflicts, gear damage/loss, and increased risk of allision or collision.

Turbine structures could increase the presence of, and recreational fishing for, structure-affiliated species, including some groundfish species such as Atlantic cod. This could potentially lead to socioeconomic benefits in terms of increased for-hire fishing revenues and angler satisfaction in certain wind development areas. 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 (AWEA 2020).

[45] https://d23h0vhsm26o6d.cloudfront.net/240205-Final-Rule-HAPC-2024-02239.pdf

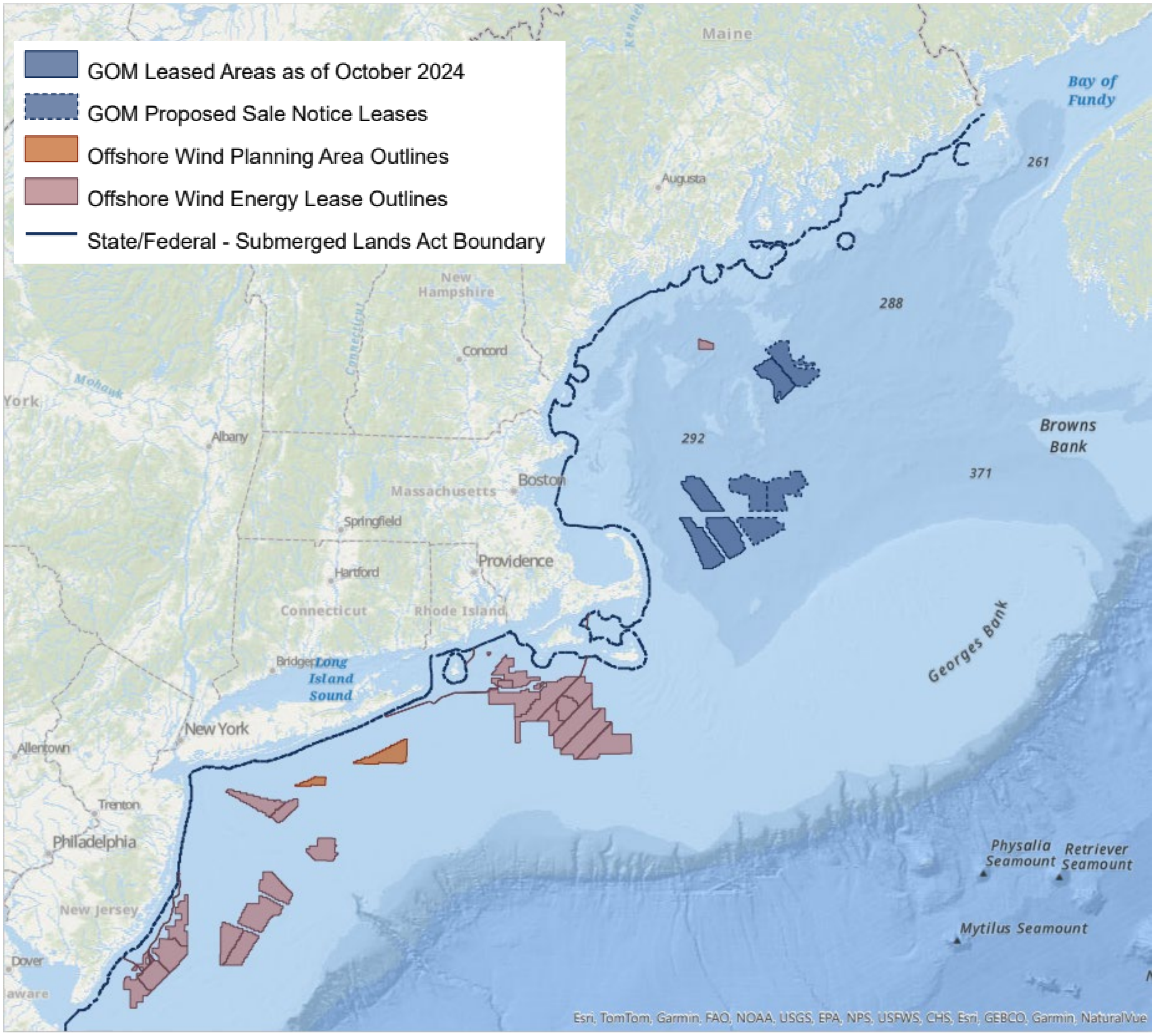
[46] The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing,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

As the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities. Development of these areas may cause regional changes to fishing practices which could cause indirect effects on the groundfish resource and fishery. Overall, this analysis represents only a rough approximation of potential negative and positive effects from offshore wind energy development.

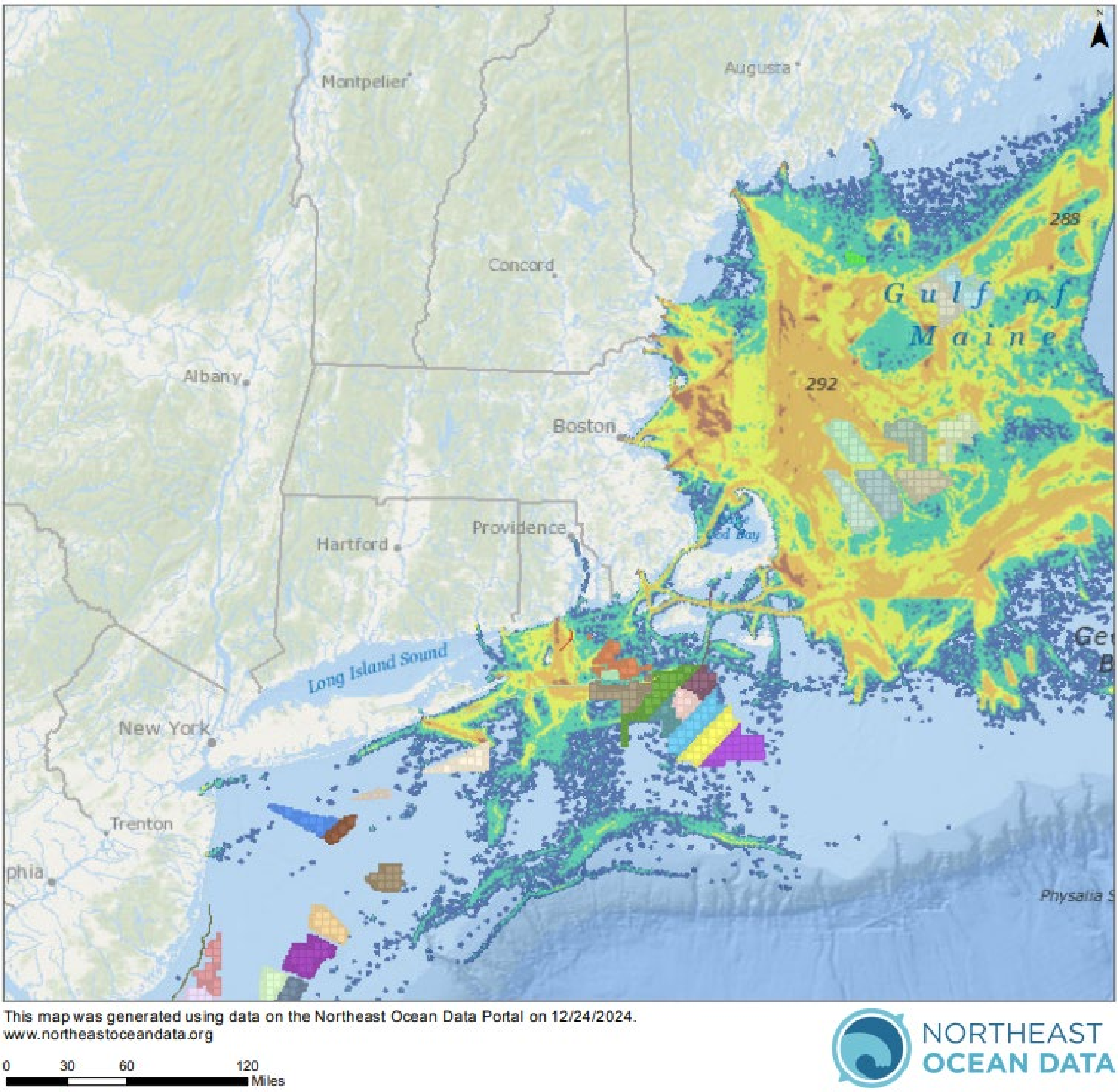
Offshore Energy Summary

The overall impact of offshore wind energy development on the affected species and their habitats at a population level is unknown but could range from slight positive impact to moderate negative, depending on the number and locations of projects that occur, and the given species. 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 impacts on resources. 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 impact on socioeconomic resources is likely slight positive to moderate negative; potentially positive due to a potential increase in jobs and recreational fishing opportunities, but negative due to displacement and disruption of commercial fishing effort.

Map 4 – BOEM Wind Planning areas and Wind Leasing Areas on the Atlantic Outer Continental Shelf.



Map 5 – Northeast Multispecies FMP vessel activity (VMS, May 2015 – April 2019) relative to wind energy active lease areas (bright multicolored) and planning areas (pastel multicolored).



6.7.2.2.2 Global Climate Change

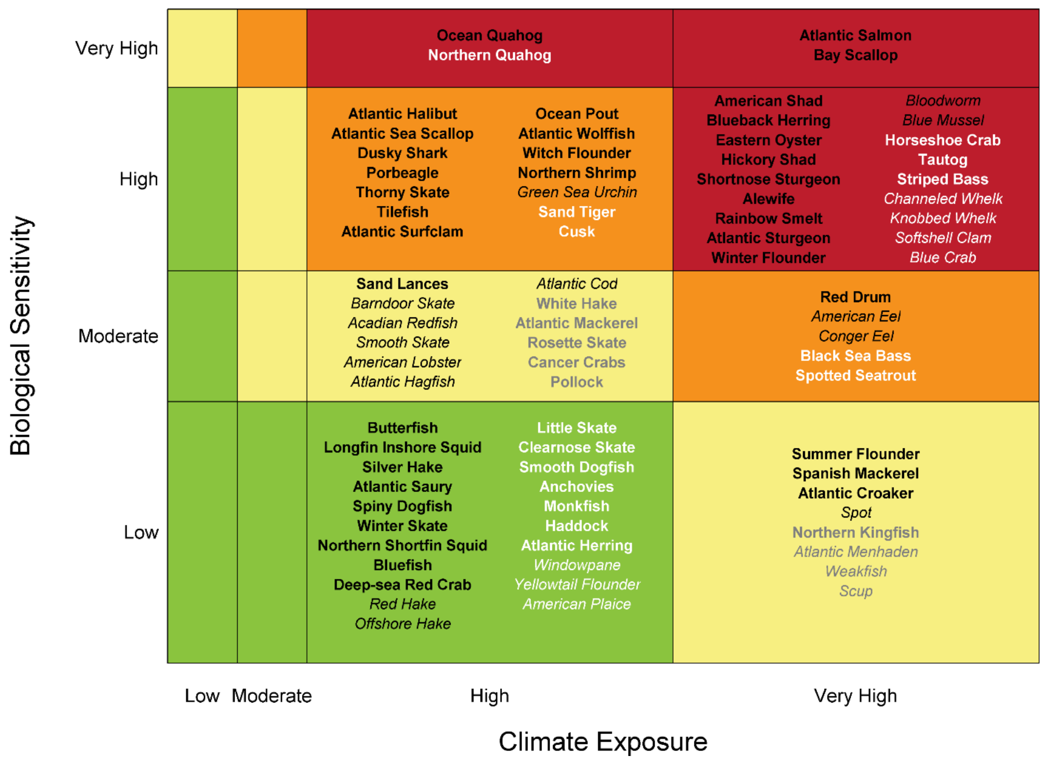
Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity and duration 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 (Hare et al. 2016). 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, depending on the adaptability of each species to the changing environment (Hare et al. 2016).

Based on this assessment, groundfish species were scored as having a range of climate vulnerability. Winter flounder were scored as having very high climate vulnerability with high certainty (Hare et al. 2016). Witch flounder, Atlantic halibut, ocean pout, and Atlantic wolfish were scored as having high climate vulnerability with very high certainty (Hare et al. 2016). Atlantic cod and Acadian redfish were scored as having moderate climate vulnerability with high certainty, while white hake and pollock were scored as having moderate climate vulnerability with moderate certainty (Hare et al. 2016). Haddock were scored as having low climate vulnerability with moderate certainty (Hare et al. 2016). Finally, yellowtail flounder, American plaice, and windowpane flounder were scored as having low climate vulnerability with low certainty (Hare et al. 2016). Refer to the Risk Policy Matrices (Appendix V) which include a summary of climate impacts for each stock.

Overall vulnerability results for additional Greater Atlantic species, including most of the non-target species identified in this action, are shown in Figure 38 (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 38 – Overall climate vulnerability score for fish and invertebrates on the Northeast U.S. Continental Shelf (Hare et al. 2016).



Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90–95%, black, italic font), moderate certainty (66–90%, white or gray, bold font), low certainty (<66%, white or gray, italic font).

Baseline Condition for Resources, Ecosystems, and Human Communities

Table 77 and Table 78 summarize 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 77 and Table 78. As mentioned above, the CEA Baseline is then used to assess cumulative effects of the proposed management actions.

Table 77 – Cumulative effects assessment baseline conditions of regulated groundfish stocks.

<table>
<tr><th colspan="2">VEC</th><th>Status/Trends, Overfishing</th><th>Status/Trends, Overfished</th><th>Combined Effects of Past, Present Reasonably Foreseeable Future Actions</th><th>Combined CEA Baseline Conditions</th></tr>
<tr><td rowspan="22">Regulated Groundfish Stocks</td><td>GB Cod*</td><td>No</td><td>Yes</td><td rowspan="22">Negative – short term: Several stocks are currently overfished, have overfishing occurring, or both;

Positive – long term: Stocks are being managed to attain rebuilt status</td><td rowspan="22">Negative – short term: Overharvesting in the past contributed to several stocks being overfished or where overfishing is occurring;

Positive – long term: Regulatory actions taken over time have reduced fishing effort and with the addition of Amendment 16, stocks are expected to rebuild in the future</td></tr>
<tr><td>EGOM Cod*</td><td>No</td><td>Yes</td></tr>
<tr><td>WGOM Cod*</td><td>Yes</td><td>Yes</td></tr>
<tr><td>SNE Cod*</td><td>Yes</td><td>Yes</td></tr>
<tr><td>GB Haddock</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>GOM Haddock</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>GB Yellowtail Flounder</td><td>Unknown</td><td>Yes</td></tr>
<tr><td>SNE/MA Yellowtail Flounder</td><td>No</td><td>Yes</td></tr>
<tr><td>CC/GOM Yellowtail Flounder</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>American Plaice</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>Witch Flounder</td><td>Unknown</td><td>Yes</td></tr>
<tr><td>GB Winter Flounder</td><td>No</td><td>No</td></tr>
<tr><td>GOM Winter Flounder</td><td>No</td><td>Unknown</td></tr>
<tr><td>SNE/MA Winter Flounder</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>Acadian Redfish</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>White Hake</td><td>No</td><td>No</td></tr>
<tr><td>Pollock</td><td>No</td><td>No, Rebuilt</td></tr>
<tr><td>Northern (GOM-GB) Windowpane Flounder</td><td>No</td><td>Yes</td></tr>
<tr><td>Southern (SNE-MA) Windowpane Flounder</td><td>No</td><td>No</td></tr>
<tr><td>Ocean Pout</td><td>No</td><td>Yes</td></tr>
<tr><td>Atlantic Halibut</td><td>Unknown</td><td>Yes</td></tr>
<tr><td>Atlantic Wolffish</td><td>No</td><td>Yes</td></tr>
</table>

*Stock status from 2024 management track assessment, determination by NOAA Fisheries pending

Table 78 – Cumulative effects assessment baseline conditions of non-groundfish species, habitat, protected resources, and human communities.

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions	Combined CEA Baseline Conditions
Non-groundfish Species (principal species)	**Monkfish**	Unknown overfished and overfishing is unknown.	**Positive** – Continued management of directed stocks will also control incidental catch/bycatch.	**Positive** – Although prior groundfish management measures likely contributed to redirecting effort onto non-groundfish species, as groundfish rebuild this pressure should lessen and all of these species are also managed through their own FMP.
	Dogfish	Not overfished and overfishing is not occurring.		
	Skates	Thorny skate is overfished and overfishing is not occurring. Little skate and winter skate are not overfished but overfishing is occurring. All other skate species are not overfished and overfishing is not occurring.		
Habitat		Fishing impacts are complex and variable and typically adverse. (Non-fishing activities had historically negative but site-specific effects on habitat quality.	**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities. An omnibus amendment to the FMP with mitigating habitat measures is under development.	**Mixed** – Reduced habitat disturbance by fishing gear but impacts from non-fishing actions, such as climate change, could increase and have a negative impact.
Protected Resources	**Sea Turtles**	Leatherback and Kemp's ridley sea turtles are classified as endangered under the ESA; loggerhead (NW Atlantic Ocean DPS) and green (North Atlantic DPS) sea turtles are classified as threatened.	**Mixed** – Reduced gear encounters through effort reductions and management actions taken under the ESA/MMPA should help mitigate the risk of gear interactions. As stocks improve, effort may increase, possibly increasing interactions. Non-fishing activities and changes from offshore energy and global climate change could have negative impacts.	**Mixed** – Continued catch and effort controls are likely to reduce gear encounters through effort reductions, unless effort increases under improving groundfish stock conditions. Additional management actions taken under the HPTRP, BDTRP, and ALWTRP should also help mitigate the risk of gear interactions. Non-fishing activities and changes from offshore energy and global climate change could have negative impacts.
	Fish	Atlantic salmon (Gulf of Maine DPS): threatened under ESA Atlantic sturgeon: New York Bight, Chesapeake, Carolina, and South Atlantic DPSs are endangered under ESA; Gulf of Maine DPS is listed as threatened under the ESA Giant manta ray: threatened under ESA		
	Large Cetaceans	All large whales in the Northwest Atlantic are protected under the MMPA. Of these large whales, North Atlantic right, fin, blue, sei, and sperm whales are also listed as endangered under the ESA.		

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions	Combined CEA Baseline Conditions
Protected Resources	**Small Cetaceans**	All are protected under the MMPA	**Mixed** – reduced gear encounters through effort reductions and management actions taken under the ESA and MMPA have had a positive impact	**Mixed** – reduced gear encounters through effort reductions and additional management actions taken under the ESA and MMPA.
	Pinnipeds	All are protected under the MMPA		
Human Communities		Complex and variable. Although there are exceptions, generally groundfish landings have decreased for most New England states since 2001. Declines in groundfish revenues since 2001 have also generally occurred.	**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past several years have had negative impacts on communities	**Negative –** short term: lower revenues would continue until stocks are sustainable **Positive** – long term: sustainable resources should support viable communities and economies

6.7.3 Summary of Effects of the Proposed Actions

Amendment 25 would set specifications and adjust management measures for the groundfish fishery to achieve the objectives of the fishery management plan (FMP). The preferred alternatives in this action are described in Section 4.0. The impacts of the proposed actions are described in Section 6.0 and summarized in Table 79 below.

Table 79 – Summary of Impacts for Valued Ecosystem Components (VECs) in Revised Amendment 25 (Council preferred in gray).

Actions and Alternatives/Options			Direct and indirect impacts				
			Managed Resources	**Non-target species**	**Habitat/ Essential Fish Habitat**	**Protected Resources**	**Human communities (economic and social impacts)**
Action 1: Incorporate Revised Atlantic Cod Stock Units in the Northeast Multispecies FMP	**Alt. 1 – No Action**		No direct or indirect impacts; see alternatives in Actions 2-5	No direct or indirect impacts; see alternatives in Actions 2-5	No direct or indirect impacts; see alternatives in Actions 2-5	No direct or indirect impacts; see alternatives in Actions 2-5	No direct or indirect impacts; see alternatives in Actions 2-5
	Alt. 2 – Status Quo						
	Alt. 3 – Revise Atlantic Cod Stock Units in the FMP						
Action 2: Atlantic Cod Status Determination Criteria	**Alt. 1 - No Action**		Negl. to -	Negl.	Negl.	No direct impacts; Indirect impacts: negl.	Economic: - Social: -
	Alt. 2 – New Status Determination for Cod Stocks		Negl. to +	Negl.	Negl.	No direct impacts; Indirect impacts: slight – to slight +	Economic: low + Social: Slight – to +
Action 3: Revised Specifications for Atlantic Cod	**Alt. 1 – No Action**		+	+	+	Slight – to moderate +	Economic: Negl. to high – Social: – to low +
	Alt 2 – Revised Specifications		- to slight +	Slight – to slight +	Slight –	Slight – to slight +	Economic: Slight – to + Social: – to low +
	Alt. 3 – Southern New England Cod Recreational Sub-ACL	Option 1 – No Action	-	No direct or indirect impacts	No direct or indirect impacts	Negl. to slight –	Economic: - Social: -
		Option 2 – Set Southern New England Cod Recreational Sub-ACL	+	No direct or indirect impacts	No direct or indirect impacts	Negl. to slight –	Economic: + Social: +

Actions and Alternatives/Options			Direct and indirect impacts				
			Managed Resources	**Non-target species**	**Habitat/ Essential Fish Habitat**	**Protected Resources**	**Human communities (economic and social impacts)**
Action 4: Commercial Fishery Management Measures – Atlantic Cod	**Alt. 1 – Common Pool Accountability Measures for Cod Stocks**	Option 1 – No Action	Negl. to -	Negl.	Negl.	Negl. to slight –	Economic: - to + Social: - to +
		Option 2 – Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closures Areas for Cod Stocks	+	Negl.	Negl.	slight – to slight moderate +	Economic: - to + Social: – to +
		Option 3 – Common Pool Baseline Trip Limits for Cod Stocks	+	Negl.	Negl.	Slight – to slight moderate +	Economic: - to + Social: - to +
Action 5: Recreational Fishery Management Measures – Atlantic Cod	**Alt. 1 – Recreational Fishing Measures for Southern New England Cod**	Option 1 – No Action	-	Negl.	Negl.	Slight – to slight +	Economic: - to + Social: - to +
		Option 2 – Recreational Fishing Measures for Southern New England Cod	Slight +	Negl. to slight +	Negl.	Slight – to slight moderate +	Economic: - to + Social: - to +
	Alt. 2 – Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks	Option 1 – No Action	Negl. to +	No direct or indirect impacts	Negl.	Negl.	Economic: Negl. Social: Negl. to low –
		Option 2 – Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod	Negl. to +	No direct or indirect impacts	Negl.	Negl.	Economic: Negl. Social: Negl. to low +

6.7.4 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 79 provides a summary of likely impacts found in the various groups of management alternatives contained in this action. The CEA baseline, as described above in Table 77 and Table 78 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 positive to negative.

6.7.4.1 Magnitude and Significance of Cumulative Effects on Managed Resources

Past fishery management actions taken through the Northeast Multispecies FMP 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 mitigating measures, such as accountability measures, are effective; however, these actions have generally had a positive cumulative effect on groundfish. It is anticipated that the future management actions described in Section 6.7.2.1 will have additional indirect positive effects on the target species through actions that 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 Amendment 25 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 positive impacts on regulated groundfish resource.*

6.7.4.2 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 some 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 6.2, the actions proposed by Framework 69 would likely continue this trend. Future actions are anticipated to continue rebuilding non-target stocks and limit the take of incidental/bycatch in the groundfish fishery, particularly through mitigation measures like sub-

ACLs and AMs. The other 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. Continued management of directed stocks will also control catch of non-target species.

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 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 Amendment 25 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 positive impacts on non-target species.*

6.7.4.3 Magnitude and Significance of Cumulative Effects on Physical Environment

Past fishery management actions taken through the Habitat amendments, the Northeast Multispecies 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 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 6.3, 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. Although the impacted areas have been fished for many years with many different gear types, continued fishing effort will continue to impact habitats at the same effort level. 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 Amendment 25 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.*

6.7.4.4 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).

Taking into consideration the above information and information provided in Section 5.6, past fishery management actions taken through the respective FMPs and annual specifications process, and non-fishing activities have had mixed cumulative effects on protected species. The management actions have constrained fishing effort both at a large scale and locally, and have implemented, pursuant to the ESA, MMPA, or MSA, gear modifications, requirements, and management areas. These measures and/or actions have served to reduce interactions between protected species and fishing gear. It is anticipated that future management actions, described in Section 6.7.2.1 will result in mixed effects on protected species, as continued catch and effort controls are likely to reduce gear encounters through effort reductions; however, should such controls result in improved groundfish stock conditions, effort increases are possible. Should the latter occur, additional management actions taken under ESA/MMPA would help to mitigate the risk of gear interactions.

Non-fishing activities and their impacts are described in Section 6.7.2.2. It is expected that these activities will result in both direct and indirect impacts with mixed effects on protected species. For some species, activities like offshore wind development and global climate change can constrain productivity, shift distributions, and reduce tolerance to fishing efforts. Though, for others, offshore wind development and climate change may provide some benefits including increased availability of viable habitat, food and nutrients, or decreased competition and predation. Future management actions, described in Section 6.7.2.1.4, will result in some degree of positive impacts on protected species by reducing the number of interactions with fishing gear, and designating new areas of critical habitat.

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, thereby maintaining existing tolerances to impacts from fishing effort. As described in Section 6.4, the proposed action is expected to have impacts on protected species that range from slight negative to slight positive, depending on the species.

When the direct and indirect effects of the Amendment 25 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 to slight positive impacts.*

6.7.4.5 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 allocations have had both positive and negative cumulative effects on human communities. They have benefited 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 and the extent to which mitigating measures like AMs are effective. Quota overages may alter the timing of commercial fishery revenues such that revenues can be realized a year earlier. Fishermen may be impacted by reduced revenues in years which the overages are deducted. Similarly, recreational fisheries may have decreased harvest opportunities due to reduced harvest limits as a result of overages and more restrictive management measures (e.g. minimum fish size, possession limits, fishing seasons) implemented to address overages.

It is anticipated that the future management actions described in Section 6.7.2.1 will result in long-term 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 short-term reduced revenues. 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 groundfish fishery has both direct and indirect positive social impacts. As previously described in Section 6.5 and Section 6.6, it is uncertain whether the preferred alternatives will result in substantial changes to levels of fishing effort or the character of that effort relative to current conditions. However, 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 Amendment 25 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 to slight positive impacts.* However, the overall combination of impacts thus far has been consistently negative for human communities.

6.7.5 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).

The preferred alternative for incorporating the revised Atlantic cod stock units into the FMP has no direct impacts, as impacts are determined from the implementing measures in Actions 2-5. The preferred alternative for setting Atlantic cod status determination criteria is expected to have negligible to positive impacts on the managed resource, negligible impacts on non-target species, no direct but slight negative to slight positive indirect impacts on protected resources, negligible impacts on the physical environment, and low positive economic impacts and slight negative to positive social impacts on human communities. For the 2025-2027 specifications, the preferred alternative is expected to have negative to slight positive impacts on the managed resource, slight negative to slight positive impacts on non-target species, slight negative impacts on the physical environment, slight negative to slight positive impacts on protected resources, slight negative to positive economic impacts on human communities, and negative to low positive social impacts on human communities. The preferred alternatives for common pool measures for Atlantic cod are expected to have negligible to positive impacts on the managed resource, negligible impacts on non-target species, slight negative to slight moderate positive impacts on protected resources, negligible impacts on the physical environment, and positive to negative economic and social impacts on human communities. The preferred alternative and option for recreational measures for Southern New England cod are expected to have slight positive impacts on the managed resource, negligible to slight positive impacts on non-target species, likely slight negative to slight moderate positive impacts on protected resources, negligible impacts on the physical environment, and positive to negative economic and social impacts on human communities. The preferred alternative and option to adjust recreational measures for Eastern Gulf of Maine and Georges Bank cod are expected to have negligible to positive impacts on the managed resource, no direct or indirect impacts on non-target species, negligible to slight negative impacts on protected resources, negligible impacts on the physical environment, and negligible to low positive economic and social impacts on human communities.

The preferred alternatives are consistent with other management measures that have been implemented in the past for the fishery. These measures are part of a broader management scheme for the groundfish 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 mixed and are expected to continue in that manner for the foreseeable future. Although some aspects of VECs may experience negative impacts if effort increases as groundfish stocks improve, continued catch and effort controls and additional management actions taken under ESA/MMPA should help mitigate the risk of gear interactions.

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 80). Cumulatively, through 2030 it is anticipated that the preferred alternatives will result in non-significant impacts on all VECs, ranging from slight negative to slight positive.

Table 80 – Summary of Cumulative Effects of the Preferred Alternatives.

	Managed Resource	**Non-Target Species**	**Habitat**	**Protected Resources**	**Human Communities**
Direct/Indirect Impacts of Preferred Alternative	Mixed (slight positive, negligible, and slight negative)	Mixed (slight positive, negligible, and slight negative)	Mixed (slight negative, negligible, and slight positive)	Mixed (low-moderate negative to slight moderate positive)	Negative to positive
Combined Cumulative Effects Assessment Baseline Conditions	Negative (short-term), positive (long-term)	Positive	Mixed	Mixed	Negative (short-term), positive (long-term)
Cumulative Effects	Slight positive	Slight positive	Slight negative	Mixed	Negative (short-term), positive (long-term)

7.0 APPLICABLE LAWS/EXECUTIVE ORDERS

7.1 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT – NATIONAL STANDARDS

7.1.1 National Standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires 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 MSA.

Specifically, the Council considered national standard guidelines for adding or removing a stock from an FMP. The National Standard Guidelines at 50 CFR 600.305(c)(7) state that councils should periodically review FMPs and the best scientific information available (BSIA) [§ 600.315(a)] to determine if the stocks are appropriately defined. The approved Atlantic Cod Research Track Assessment, the resulting four Woods Hole Assessment Models (WHAM), and the four approved management track assessments using the WHAM models are the latest peer reviewed science and would be the basis for setting SDCs, OFLs, and ABCs for the four new Atlantic cod stocks to be incorporated into the Northeast Multispecies FMP as proposed in this action.

The guidelines at § 600.305(c) state that any stock that is predominately caught in Federal waters and is overfished or subject to overfishing, or likely to become overfished or subject to overfishing, is considered to require conservation and management. In the same paragraph, the guidelines also include a non-exhaustive list of factors that a council should consider when deciding whether stocks require conservation and management (see below), and states that no one of the factors is determinative or required when considering adding a stock to an FMP. Through this consideration, the Council should prepare a thorough analysis of the factors listed below, and any additional considerations that may be relevant to provide the basis for determining that a stock requires conservation and management:

(i) The stock is an important component of the marine environment.

(ii) The stock is caught by the fishery.

(iii) Whether an FMP can improve or maintain the condition of the stock.

(iv) The stock is a target of a fishery.

(v) The stock is important to commercial, recreational, or subsistence users.

(vi) The fishery is important to the Nation or to the regional economy.

(vii) The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.

(viii) The economic condition of a fishery and whether an FMP can produce more efficient utilization.

(ix) The needs of a developing fishery, and whether an FMP can foster orderly growth.

(x) The extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law.

The Council considered each of the factors listed above for adding the revised Atlantic cod stock units to the FMP:

i. The stock is an important component of the marine environment.

Cod are generalists and important predators and prey within the marine environment. As prey, it has been noted that they are especially vulnerable to gray seals, spiny dogfish, and black sea bass; the latter two of which are managed under their own fishery management plans through the New England Fishery Management Council and the Mid-Atlantic Fishery Management Council, respectively. As juvenile predators, they feed on mainly copepods, mysid shrimp, hermit crab larvae, and crustaceans, while as small adult predators they feed on smaller fish like sand lance and silver hake, with prey size increasing as a function of adult size.

ii. The stock is caught by the fishery.

Atlantic cod have been commercially harvested for centuries. Recently, during fishing years 2019-2023, the average landed amount of cod within[47]:

- the proposed new GB stock area was 271,753 pounds generating an average revenue of $617,725 and constituting 4.4% of the revenue landed by species in the GB stock area;
- the proposed WGOM stock area was 853,661 pounds generating an average revenue of $2,200,952, constituting 4.4% of the revenue landed by species in the WGOM stock area;
- the proposed EGOM stock area was 2,259 pounds generating an average revenue of $7,090, constituting 0.4% of the revenue landed by species in the EGOM stock area; and
- the proposed SNE stock area was 6,324 pounds generating an average revenue of $16,920 constituting 0.5% of the revenue landed by species in the SNE stock area. The majority of cod catch in the SNE stock area comes from the recreational fishery, averaging around 93% of the catch in calendar years 2019 through 2023.

Atlantic cod is also caught recreationally. During fishing years 2019-2023, average total catch of cod by the recreational fishery within[48]:

- The previous GOM stock area, which for the recreational fishery largely overlaps with the WGOM stock area, was 149 mt;
- The previous GB stock area, which for the recreational fishery largely overlaps with the SNE stock area, was 215 mt.

It is important to note that management actions since their introduction into the Northeast Multispecies FMP have reduced fishery catch as a function of decreasing populations of Atlantic cod over time to meet the goals and objectives of the FMP. Nonetheless, the commercial and recreational fisheries on average utilize the majority of the annual catch limits that they are allocated for Atlantic cod.

iii. Whether an FMP can improve or maintain the condition of the stock.

[47] See: Groundfish PDT memo to SSC re OFLs and ABCs for Atlantic cod stocks, FY2025 -2027

[48] See: Northeast Multispecies Year-End Catch Reports: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/h/groundfish_catch_accounting and https://d23h0vhsm26o6d.cloudfront.net/4_241108-Recreational-Catch-and-Effort-Statistics-Cod-and-Haddock-NEFSC.pdf

Atlantic cod in U.S. waters are currently included in the Northeast Multispecies FMP. Historically, Atlantic cod has been managed and assessed as two stock units: a GOM stock unit, which encompasses the proposed EGOM stock areas and the northern portion of the WGOM stock areas, and a GB stock unit which encompasses the new GB and SNE stock areas and the southern portion of the WGOM stock area. Each stock has a status of overfished and two stocks, WGOM and SNE, are subject to overfishing. The current GB stock is in a rebuilding plan scheduled to end in 2026 and the GOM stock is in a rebuilding plan scheduled to end in 2024. The Atlantic Cod Stock Structure Working Group (McBride and Smedbol 2022) and the subsequent research track stock assessment (NEFSC 2023) have attributed these statuses due to the lack of understanding between the biologically distinct populations and the potential for stock mixing, as well as a mismatch between management units and the biological populations.

Recognizing the new stock structure in the FMP could help prevent loss of spawning populations and balance fishing mortality across biological populations. It could also allow stock-specific management measures that facilitate recovery of depleted stocks and strengthen their resilience (McBride and Smedbol 2022).

iv. The stock is a target of a fishery.

Historically, Atlantic cod was a primary target of the commercial and recreational groundfish fisheries. The Northeast Multispecies FMP was created in 1985 and included Atlantic cod from the beginning. However, in recent years, it has become a constraining species for the sector program within the commercial and recreational groundfish fleets. As detailed above, cod remains an important part of the commercial and recreational fisheries.

v. The stock is important to commercial, recreational, or subsistence users.

Each new proposed Atlantic cod stock is important commercially and/or recreationally. The SNE cod stock mainly supports a recreational fishery with little effort seen from the commercial fishery in recent years. Conversely, the revised GB cod stock and EGOM cod stock supports the commercial fishery contingent and sees little to no effort from the recreational fleet. The WGOM stock supports commercial and recreational fisheries. Further, once rebuilt, it is expected these stocks would support more vibrant fisheries.

vi. The fishery is important to the Nation or to the regional economy.

Historically, cod was the basis of the economy in New England, as memorialized among some of the first coinage minted in the region and the iconic ‘Sacred Cod’ that hangs in the Massachusetts State House in Boston. Because of its historic role in the founding of the region’s economy, cod resonates in the culture of this place and the people that live within it. The cod fishery continues to be an important part of the regional character, culture, and local communities. Once rebuilt, the cod stocks will support a stronger fishery with increased economic and social benefits for communities within the region.

vii. The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.

Recognizing the new stock structure in the FMP could allow stock-specific management measures that facilitate recovery of depleted stocks and strengthen their resilience (McBride and Smedbol 2022). There are multiple sectors in the fishery that fish in these geographic areas and have catch or bycatch of cod. Revising the stock structure to better match the biological populations may allow for tailored management measures for the corresponding stocks and areas. Additionally, for the recreational fishery it could allow for component-specific measures to balance the needs of private anglers and for-hire recreational businesses.[49]

The United States and Canada have been jointly managing several groundfish stocks included in the Northeast Multispecies FMP since 1998 under the U.S./Canada Resource Sharing Understanding. The eastern portion of the current GB cod stock was added to the shared management agreement in 2004. The revised GB stock would continue to be jointly managed by the US and Canada.

viii. The economic condition of a fishery and whether an FMP can produce more efficient utilization.

Atlantic cod has been managed under the Northeast Multispecies FMP since 1985. Notable amendments to the FMP include Amendment 16 (2010) which broadly adopted the sector management program and a system of annual catch limits and accountability measures to maintain catch levels, and Amendment 17 which expanded sector provisions to state operated permit banks. Members within the sector program noted at the Atlantic Cod Management Transition Workshops[50] the importance of permit banks to allow for the distribution of fish at reduced costs, and its role as a buffer supporting the sustainability of the fishery. Revising the stock structure to better match the biological populations is expected to improve the probability of rebuilding the U.S. populations of Atlantic cod and could allow further support to the commercial fishery to stabilize the market.

ix. The needs of a developing fishery, and whether an FMP can foster orderly growth.

The U.S. fishery for Atlantic cod is well established, but revising the stock structure to better match the biological populations is expected to improve the probability of rebuilding the U.S. populations of Atlantic cod. Recognizing the new stock structure in the FMP could facilitate stabilizing of the commercial fishery market and a reduction in barriers to entry of the fishery to foster orderly growth as the stocks rebuild to healthy populations. Additionally, including the stock boundaries would be instrumental to improved monitoring and better performing assessments that could in turn provide support for further growth in the cod fishery.

x. The extent to which the fishery is already adequately managed by states, by state/Federal programs, or by Federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law.

The Atlantic cod fishery is currently managed under the Northeast Multispecies FMP and by state fishery management agencies. The sector program allows for the flexibility and self-regulation of permitted vessels to operate within the bounds of their allocated sub-ACL. Revising the stock structure for Atlantic cod within the Northeast Multispecies FMP would be consistent with National Standard 2 requirements for use of the best scientific information available. Further, revising the stock structure to better match biological populations would better support management to rebuild the Atlantic cod stocks, consistent with National Standard 1, to support commercial and recreational fisheries.

National Standard 1 - The Northeast Multispecies FMP includes measures to end overfishing on groundfish stocks. This action adjusts those measures to maximize optimum yield while preventing overfishing and continuing rebuilding plans. For overfished fisheries, the MSA defines optimum yield as the amount of fish that provides for rebuilding to a level consistent with producing the maximum sustainable yield from the fishery. The measures are designed to achieve the fishing mortality rates, and

[49] See: Atlantic Cod Management Transition Workshops Summary Report

[50] Atlantic Cod Management Transition Workshops Summary Report

yields, necessary to rebuild the overfished stocks as well as to keep fishing mortality below overfishing levels for stocks that are not in a rebuilding program. The measures in Section 1.0 set controls on catch to ensure the appropriate fishing mortality rates are implemented by adjusting OFLs, ABCs, and ACLs for several stocks, setting a recreational sub-ACL for SNE cod, establishing common pool AMs for the four revised Atlantic cod stocks, and setting recreational measures for SNE cod. These include measures that set OFLs, ABCs, and ACLs and establish AMs for the four revised Atlantic cod stocks that would be incorporated into the FMP. These measures are designed to facilitate achieving optimum yield through considering a balance of conservation needs and mitigating adverse socioeconomic impacts. Revising the stock structure to better match biological populations would better support management to rebuild the Atlantic cod stocks.

National Standard 2 - The Preferred Alternatives are based on the most recent information on stock status available for all stocks in the Northeast multispecies complex, which is provided by the Northeast Fisheries Science Center in the 2024 Groundfish Management Track Assessments and prior Research Track Assessments. Additionally, the mortality limits were determined based on the scientific advice of the NEFMC SSC, which recommends ABCs to the Council.

With respect to bycatch information, the action uses information from the most recent assessments. While additional observer data has been collected since the most recent assessments were completed, it has not been analyzed or reviewed through the stock assessment process and thus cannot be used.

The economic analyses in this document are based primarily on landings, revenue, and effort information collected through the NMFS data collection systems used for this fishery. The Quota Change Model is used to analyze the economic impacts of each combination of measures on the sector portion of the groundfish fishery.

National Standard 3 - The Preferred Alternatives manage each individual groundfish stock as a unit throughout its range. Management measures specifically designed for one stock are applied to the entire range of the stock. In addition, the groundfish complex management measures are designed and evaluated for their impact on the fishery as a whole. This action incorporates the four revised Atlantic cod stocks into the FMP. Measures in this action represent Phase 1 of a multi-year effort to transition management of Atlantic cod to the revised stock units.

National Standard 4 - The Preferred Alternatives do not discriminate between residents of different states. They apply equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they have different impacts on different participants because of the differences in the distribution of fish and the varying stock levels in the complex. Some of these impacts may be localized, as often communities near a fish stock may have developed small boat fisheries that target that stock. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks and the uneven geographical distribution of fish stocks and the targeting of different stocks by individual vessels.

The Preferred Alternatives do allocate fishing privileges. For SNE cod, available catch is allocated to the recreational and commercial components of the fishery. The No Action alternative allocates to the commercial fishery with an accountability measure that reduces future commercial catch if there are overages contributed to by both the recreational and commercial fisheries, even if the recreational fishery catches a majority of the fish. Reducing future catch attempts to address both operational issues that lead to an overage and the biological consequences of an overage. While there currently are recreational measures such as bag limits that are intended to control operational issues contributing to overages, the current catch target basis for such management measures is not a hard limit that results in a specified reduction in future available recreational catch. Instead, the responsibility for adhering to the catch allocation falls directly on the commercial fishery and has led to the concern that the commercial component had to pay for excessive fishing pressure by the recreational component, particularly when the recreational component accounts for the majority of catch. The sub-annual catch limit for the recreational fishery is intended to more fairly and reasonably allocate responsibility for operating within limits that may be subject to future reductions if exceeded to address the biological consequences of overages. This is particularly salient given the very low ABC for FY2025 and for FY2026 where available catch is extremely limiting for all participants. Thus, the allocation to the commercial and recreational fisheries is based on a balance between the recent catch history and the estimated amount of catch that the commercial fishery is expected to achieve in FY2025. This represents fair catch accountability basis that is expected to lead to more effective management and promote rebuilding and conservation. Further, the allocation sets an initial balance between the recreational and commercial fisheries that the Council anticipates monitoring and revisiting in subsequent years. The recreational/commercial allocation for SNE cod will make it easier in the future to develop measures for the appropriate component in order to control fishing mortality. For WGOM cod, an apportionment approach maintains existing commercial PSCs, as intended by the Council for Phase 1 of the Atlantic Cod Management Transition Plan, because the WGOM stock boundary consists of statistical areas that were part of the former GOM stock area and a portion that were part of the former GB stock area. This decision is based on catch history from a selection of years over 2010-2023, intended to approximate current apportionment to the extent practicable by accounting for the influence of past management measures and quota differences between the two former stocks on catches in these two portions of the WGOM. Finally, there is a commercial/recreational allocation for WGOM cod, which is based on the same catch history previously used for the former GOM cod commercial/recreational allocation, updated to the WGOM stock area.

National Standard 5 - The Preferred Alternatives are not expected to significantly reduce the efficiency of fishing vessels. These measures are considered practicable since they allow rebuilding of depleted groundfish stocks and have considered efficiency to the greatest extent possible. None of the measures in this action have economic allocation as their sole purpose; all are designed to contribute to the control of fishing mortality.

National Standard 6 - The primary controls used in this management plan - effort controls and sectors - allow each vessel operator to fish when and how it best suits his or her business. Vessels can make short or long trips and can fish in any open area at any time of the year. The measures allow for the use of different gear, vessel size, and fishing practices. The specific measures adopted in this action do not reduce this flexibility. Increasing available catch for some stocks considers changes in fishing activity in response to stock availability and interactions and economic conditions. AM modifications in this action take into account varying fishing practices among different fisheries or within a single fishery in order to more effectively achieve catch accountability.

While some of the measures used in the management plan tend to increase costs, those measures are necessary for achieving the plan's objectives. For example, measures that reduce the efficiency of fishing vessels, including time area closures, tend to increase the costs of fishing vessels since fishing catches are reduced. These measures accomplish other goals, however, by allowing groundfish stocks to rebuild. The measures do not duplicate other regulatory efforts. Management of multispecies stocks in federal waters is not subject to coordinated regulation by any other management body. Absent Council action, a coordinated rebuilding effort to restore the health of the overfished stocks would not occur.

National Standard 7 - The Council considered the costs and benefits of a range of alternatives to achieve the goals and objectives of this FMP. It considered the costs to the industry of taking no action relative to adopting the measures herein, and the expected benefits are greater in the long-term if stocks are rebuilt as a result. Under these proposed measures short-term losses in revenue and possible increases in costs can be expected as several stock ACLs would decrease.

National Standard 8 - Consistent with the requirements of the MSA to prevent overfishing and rebuild overfished stocks, the Preferred Alternatives may restrict fishing activity through the implementation of low ACLs for several groundfish stocks to achieve rebuilding targets. Analyses of the impacts of these measures show that landings and revenues are likely to decline for many participants in upcoming years due to the rebuilding programs in place for many stocks. In the short-term, these declines will probably have negative impacts on fishing communities throughout the region, but particularly on those ports that rely heavily on groundfish; however, they are needed for the long-term sustainability and benefit of these communities. Additionally, while adapting to the revised understanding of cod stock structure may have initial disruptions for fishing communities, particularly given the low ACLs, managing to the OFLs and ABCs of the newly recognized four Atlantic cod stocks will allow for more efficient rebuilding of the population and will prevent any further overfishing. Recognizing the new stock structure over the long-term could help prevent loss of spawning populations and balance fishing mortality across biological populations, contributing to the long-term sustainability of these communities.

National Standard 9 - Many measures limit the discards of both groundfish and some other species, including the sector management program, and this action is expected to continue those benefits with no substantial changes. The proposed action is necessary to minimize bycatch. Changes that permit annual catch limits to adjust to changing fish stock abundance levels are needed to prevent wasteful bycatch compared to taking no action.

National Standard 10 - The flexibility in sector management and the ability to use common pool DAS at any time promote safety by not incentivizing vessels to fish in dangerous conditions. The Preferred Alternative, in conjunction with Amendment 16 measures, is the best option for achieving the necessary mortality reductions while having the least impact on vessel safety.

7.1.2 Other MSA Requirements

This action is also consistent with the fourteen additional required provisions for FMPs. Section 303 (a) of MSA contains required provisions for FMPs.

1. *Contain the conservation and management measures, applicable to foreign fishing …*

   Foreign fishing is not allowed under this management plan or this action and so specific measures are not included to specify and control allowable foreign catch.

2. *Contain a description of the fishery …*

   Amendment 16 included a thorough description of the multispecies fishery from 2001 through 2008, including the gears used, number of vessels, landings, actual and potential revenues, costs likely to be incurred in management, and effort used in the fishery. This information was updated for Amendment 18 and again in Amendment 23. This action provides a summary of that information and additional relevant information about the fishery in Section 5.7.

3. *Assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from the fishery …*

   The present biological status of the fishery is described in Section 5.2.20. Likely future conditions of the resource are described in Section 6.7. Impacts resulting from other measures in the management plan other than the measures included here can be found in Amendment 16. The maximum sustainable yield for each stock in the fishery is defined in Amendment 16 and optimum yield for the fishery is defined in Amendment 9.

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); etc.*

   U.S. fishing vessels are capable of, and expected to, harvest the optimum yield from this fishery as specified in Amendment 16 and Frameworks 44, 45, 47, 49, 50, 51, 53, 55, 56, 57, 58, 59, 61, 63, 65, 66, and this action Amendment 25. U.S. processors are also expected to process the harvest of U.S. fishing vessels. None of the optimum yield from this fishery is available to foreign fishing.

5. *Specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery …*

   Current reporting requirements for this fishery have been in effect since 1994 and were originally specified in Amendment 5. They were slightly modified in Amendments 13, 16, and 23, and VMS requirements were adopted in FW42. The requirements include Vessel Trip Reports (VTRs) that are submitted by each fishing vessel. Dealers are also required to submit reports on the purchases of regulated groundfish from permitted vessels. Sector vessels are also required to contract with service providers for ASM or EM services. ASM and EM provide catch and bycatch data that vessels are required to submit. Current reporting requirements are detailed in 50 CFR 648.7.

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…*

   Provisions in accordance with this requirement were implemented in earlier actions, and continue with this action. For common pool vessels, the carry-over of a small number of DAS is allowed from one fishing year to the next. If a fisherman is unable to use all of his DAS because of weather or other conditions, this measure allows his available fishing time to be used in the subsequent fishing year. Sectors will also be allowed to carry forward a small amount of ACE into the next fishing year. This will help sectors react should adverse weather interfere with harvesting the entire ACE before the end of the year. Neither of these practices requires consultation with the Coast Guard.

7. *Describe and identify essential fish habitat for the fishery…*

   A summary of the EFH can be found in Section 5.5.

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) assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

   Scientific and research needs are not required for a framework adjustment action.

9. *Include a fishery impact statement for the plan or amendment …*
   Impacts of this amendment on fishing communities directly affected by this action and adjacent areas can be found in Sections 6.5 and 6.6.

10. *Specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished …*

    Objective and measurable status determination criteria for all stocks in the management plan have been updated in framework actions, including framework adjustments 48, 51, 53, 55, 56, 61, 63, and this action Amendment 25.

11. *Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery …*

    None of the measures in this amendment are expected to increase bycatch beyond what was considered in Amendment 16.

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 …*

    This management plan does not include a catch and release recreational fishery management program and thus does not address this requirement.

13. *Include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery …*

As noted above, the description of the commercial, recreational, and charter fishing sectors is updated and summarized in this document (Section 5.7.10).

14. *To the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.*

    This preferred alternative does not allocate harvest restrictions or stock benefits to the fishery. Such allocations were adopted in Amendment 16, while this action adjusts management measures for some stocks within the existing allocation structure in a fair and equitable manner.

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 FMP already contains a mechanism for establishing annual catch limits and this action uses that mechanism to specify ACLs for future fishing years.

7.2 National Environmental Policy Act

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. This EA is being prepared using the statutory requirements of NEPA, and considering the stated purpose and policy objectives contained therein, and utilizing NOAA policies and procedures for implementing NEPA consistent with applicable law. See 42 U.S.C. § 4321, et seq.; NOAA Admin. Order 216-6A (Apr. 22, 2016); and NOAA, *Policy and Procedure for Compliance with the National Environmental Policy Act and Related Authorities: Companion Manual for NOAA Administrative Order 216-6A* (Jan. 13, 2017) (Compliance Manual).

7.2.1 Environmental Assessment

The basis for this Environmental Assessment (EA) are included in this document as follows:[51]

- The need for this action is in Section 3.2;
- The alternatives that were considered are in Section 4.0;
- The environmental impacts of the proposed action are in Section 6.0;
- A description of the affected environment is in Section 5.0;
- Cumulative effects of the proposed action are in Section 6.7;
- A determination of significance is in Section 7.12; and,
- The agencies and persons consulted on this action are in Sections 7.2.3 and 7.2.4.

This document includes the following additional sections relevant to this EA.

- An executive summary is in Section 1.0;
- A table of contents is in Section 2.0;
- Background and purpose are in Section 3.0;
- A summary of the document is in the executive summary, Section 1.0;
- A list of preparers is in Section 7.2.4.

[51] 42 U.S.C. § 4336(b)(2); Compliance Manual §§ 6, 7.

7.2.2 **Point of Contact**

Questions concerning this document may be addressed to:

> Dr. Cate O'Keefe, Executive Director
> New England Fishery Management Council
> 50 Water Street, Mill 2
> Newburyport, MA 01950 (978) 465-0492

7.2.3 **Agencies Consulted**

The following agencies, in alphabetical order, were consulted in preparing this document:

- Mid-Atlantic Fishery Management Council
- National Marine Fisheries Service, NOAA, Department of Commerce
- New England Fishery Management Council, including representatives from:
    - Connecticut Department of Environmental Protection
    - Maine Department of Marine Resources
    - Massachusetts Division of Marine Fisheries
    - New Hampshire Fish and Game
    - Rhode Island Department of Environmental Management
- United States Coast Guard, Department of Homeland Security

7.2.4 **List of Preparers**

The following personnel participated in preparing this document:

- ***New England Fishery Management Council***. Robin Frede (Groundfish Plan Coordinator), Angelia Miller, Dr. Jamie Cournane, Michelle Bachman, Dr. Cate O'Keefe, Jonathon Peros, Connor Buckley, and Woneta Cloutier
- ***National Marine Fisheries Service.*** Liz Sullivan, Mark Grant, Heather Nelson, Timothy Cardiasmenos, Glenn Chamberlain, Paul Nitschke, Chuck Adams, Dr. Matt Cutler, Greg Ardini, Scott Steinback, Spencer Talmage, Dan Caless, Laura Smith, Danielle Palmer, and Kristin Carden.
- ***State Agencies.*** Rebecca Peters and Robyn Linner (Maine DMR), Matt Ayer and Tara Dolan (MA DMF), Renee Zobel (NHF&G), Rich Balouskus (RIDEM)
- ***Mid-Atlantic Fishery Management Council***. Jason Didden

7.2.5 **Opportunity for Public Comment**

[*to be updated*]

This action was developed from March 2024 through December 2024, and there were several public meetings related to this action (Table 81). Opportunities for public comment occurred at Advisory Panel, Committee, and Council meetings. There were more limited opportunities to comment at PDT meetings. The Council held three public Cod Transition Workshops in early 2024 seeking stakeholder input both on the longer-term Phase 2 of the Council's Atlantic Cod Management Transition Plan, and the development of measures to be included in Phase 1 of the transition plan through Amendment 25 and Framework 69. Meeting discussion documents and summaries are available at www.nefmc.org.

While Amendment 25 and Framework 69 were initiated in 2024, the work that went into understanding cod stock structure and transitioning from two stocks to four stocks began years earlier. An Atlantic Cod

Stock Structure Working Group, led by the NEFSC, formed in early 2018 to inventory and summarize all relevant peer-reviewed information about stock structure of Atlantic cod in U.S. and adjacent waters. The Council and NEFSC held several rounds of public Atlantic Cod Stock Structure Workshops in 2021, with three workshops focused on science/assessment and five focused on management, all held via webinar. The NEFSC and the Council assembled the Atlantic Cod Research Track Assessment Working Group, which met via webinars that were open to the public 25 times between November 2021 and July 2023, including two stakeholder engagement meetings, leading up to the July 2023 peer review. In early 2022, the Council added the Atlantic cod management transition plan to its list of 2022 priorities, and this topic was discussed at most of the Council, Committee, Advisory Panel, and PDT meetings since then. These meetings which provided opportunities for public comment on Atlantic cod management transition are summarized in Table 82.

Table 81 – Public meetings related to Framework Adjustment 69.

Date	Meeting Type	Location
03/07/2024	PDT	Webinar
03/11/2024	PDT	Webinar
03/19/2024	GAP/RAP	South Kingstown, RI and Webinar
03/20/2024	Committee	South Kingstown, RI and Webinar
04/30/2024	Public Workshop	Portland, ME
05/01/2024	Public Workshop	Wakefield, MA
05/02/2024	Public Workshop	South Kingstown, RI
06/03/2024	PDT	Webinar
06/10/2024	GAP/RAP	Danvers, MA and Webinar
06/11/2024	Committee	Danvers, MA and Webinar
06/26/2024	Council	Freeport, ME and Webinar
07/09/2024	PDT	Webinar
07/18/2024	PDT	Webinar
07/30-31/2024	SSC	Portsmouth, NH and Webinar
08/29/2024	PDT	Webinar
09/09/2024	GAP/RAP	Webinar
09/11/2024	Committee	Wakefield, MA and Webinar
09/25/2024	Council	Gloucester, MA and Webinar
09/30/2024	PDT	Webinar
10/08/2024	PDT	Webinar
10/09/2024	SSC	Providence, RI and Webinar
10/18/2024	PDT	Webinar
10/21/2024	SSC	Boston, MA and Webinar
10/23/2024	PDT	Webinar
10/28/2024	GAP/RAP	Portsmouth, NH and Webinar
10/29/2024	Committee	Portsmouth, NH and Webinar
11/13/2024	PDT	Webinar
11/21/2024	GAP/RAP	Webinar
11/25/2024	Committee	New Bedford, MA and Webinar

Date	Meeting Type	Location
12/04/2024	Council	Newport, RI and Webinar

Table 82- Public meetings related to development of Atlantic cod management transition plan leading up to Framework Adjustment 69.

Date	Meeting Type	Location
01/20/2022	Committee	Webinar
02/03/2022	Council	Webinar
03/09/2022	PDT	Webinar
03/16/2022	Committee	Webinar
04/13/2022	Council	Mystic, CT and Webinar
06/01/2022	RAP	Webinar
06/02/2022	GAP	Webinar
06/14/2022	Committee	Webinar
06/21/2022	PDT	Webinar
06/29/2022	Council	Portland, ME and Webinar
07/11/2022	PDT	Webinar
08/31/2022	GAP	Webinar
08/31/2022	RAP	Webinar
09/15/2022	Committee	East Boston, MA and Webinar
11/14/2022	RAP	Webinar
11/16/2024	PDT	Webinar
11/22/2023	Committee	Webinar
11/28/2022	PDT	Webinar
12/01/2022	RAP	Webinar
12/01/2022	GAP	Webinar
12/02/2022	Committee	Webinar
03/21/2023	PDT	Webinar
04/03/2023	RAP	Webinar
04/07/2023	GAP	Webinar
04/13/2023	Committee	Webinar
04/19/2023	Council	Mystic, CT and Webinar
06/01/2023	PDT	Webinar
06/20/2023	GAP/RAP	Wakefield, MA and Webinar
06/21/2023	Committee	Wakefield, MA and Webinar
06/28/2023	Council	Freeport, ME and Webinar
07/06/2023	PDT	Webinar
08/04/2023	PDT	Webinar
09/21/2023	GAP/RAP	Danvers, MA and Webinar
09/22/2023	Committee	Danvers, MA and Webinar
09/27/2023	Council	Plymouth, MA and Webinar

Date	Meeting Type	Location
11/13/2023	GAP/RAP/Committee	Webinar
12/07/2023	Council	Newport, RI and Webinar
01/16/2024	PDT	Webinar
01/22/2024	Committee	Webinar

7.3 Marine Mammal Protection Act (MMPA)

The proposed action is not expected to alter fishing methods or activities. Therefore, this action is not expected to impact marine mammals in any manner not considered in previous consultations on the fisheries. Section 5.6 of this action describes the marine mammals potentially impacted by the groundfish fishery and Section 6.4 summarizes the impacts of the proposed action. A final determination of consistency with the MMPA will be made by the agency when this action is approved.

7.4 Endangered Species Act (ESA)

Section 7 of the ESA requires federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species and do not adversely affect designated critical habitat of listed species.

On May 27, 2021, the National Marine Fisheries Service's (NMFS) completed formal consultation pursuant to section 7 of the ESA of 1973, as amended, and issued a biological opinion (2021 Opinion) on the authorization of eight FMPs, two interstate fishery management plans (ISFMP), and the implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2[52]. The 2021 Opinion considered the effects of the authorization of these FMPs, ISFMPs, and the implementation of the Omnibus EFH Amendment on ESA-listed species and designated critical habitat and determined that those actions were not likely to jeopardize the continued existence of any ESA-listed species or destroy or adversely modify designated critical habitats of such species under NMFS jurisdiction. An Incidental Take Statement (ITS) was issued in the Opinion. The ITS includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

On September 13, 2023, NMFS issued a 7(a)(2)/7(d) memorandum that reinitiated consultation on the 2021 Opinion. The federal actions to be addressed in this reinitiation of consultation include the authorization of the federal fisheries conducted under the aforementioned eight federal FMPs (see footnote 1). The reinitiated consultation will not include the American lobster and Jonah crab fisheries, which are authorized under ISFMPs. On December 29, 2022, President Biden signed the Consolidated Appropriations Act (CAA), 2023, which included the following provision specific to NMFS' regulation of the American lobster and Jonah crab fishery to protect right whales, "Notwithstanding any other provision of law ... for the period beginning on the date of enactment of this Act and ending on December 31, 2028, the Final Rule ... shall be deemed sufficient to ensure that the continued Federal and State authorizations of the American lobster and Jonah crab fisheries are in full compliance with the Marine

[52] The eight Federal FMPs considered in the May 27, 2021, Biological Opinion include: (1) Atlantic Bluefish; (2) Atlantic Deep-sea Red Crab; (3) Mackerel, Squid, and Butterfish; (4) Monkfish; (5) Northeast Multispecies; (6) Northeast Skate Complex; (7) Spiny Dogfish; and (8) Summer Flounder, Scup, and Black Sea Bass. The two ISFMPs are American Lobster and Jonah Crab.

Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq.) and the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.).” Given this, the American lobster and Jonah crab fisheries remain in compliance with the ESA through December 31, 2028.

On January 8, 2025, NMFS issued a memorandum titled, “Section 7(a)(2) and 7(d) Determinations for the Extended Reinitiation Period for Endangered Species Act Section 7 Consultation on Eight Fishery Management Plans.” This reinitiation memorandum determined that the authorization of these fisheries during the extended reinitiation period would not violate section 7(d) of the ESA and would not be likely to jeopardize the continued existence of ESA-listed large whales, sea turtles, Atlantic sturgeon, Atlantic salmon, or giant manta rays, or adversely modify designated critical habitat.

Based on our preliminary assessment of the proposed action, the Council has determined that the proposed action does not entail making any changes to the Northeast multispecies fishery during the extended reinitiation period that would cause an increase in interactions with or effects to ESA-listed species or their critical habitat beyond those considered in NMFS’ January 8, 2025, reinitiation memorandum. Therefore, this action is consistent with NMFS’ January 8, 2025, 7(a)(2) and 7(d) determinations.

7.5 Administrative Procedure Act (APA)

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 expects that NOAA Fisheries will publish proposed and final rule making for this action.

7.6 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) is to minimize 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 information requests. This action does not include any revisions to the current PRA collection requirements; therefore, no review under the Paperwork Reduction Act is necessary.

7.7 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the Coastal Zone Management Act (CZMA) of 1972, as amended, requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The CZMA includes measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council has developed this action and will submit it to NMFS; NMFS must determine whether this action is consistent, to the maximum extent practicable, with the CZM programs for each state (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina). Letters documenting NMFS' determination will be sent to the coastal zone management program offices of each state.

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

Framework Adjustment 69 and the proposed 2025 – 2027 fishery specifications include: a description of the management issues to be addressed, statement of goals and objectives, a description of the proposed action and other alternatives/options considered, analyses of the impacts of the proposed specifications and other alternatives/options on the affected environment, and the reasons for selecting the preferred specifications. These proposed modifications implement the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management 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 groundfish fishery and other interested parties and members of the general public. The information contained in this document may be useful to owners of vessels holding a groundfish permit as well as groundfish 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 the 2025 – 2027 specifications concerning the status of the groundfish fishery is updated based on landings and effort information through the 2023 and 2024 fishing years when possible. Information presented in this document is intended to support Framework Adjustment 69 and the proposed specifications for the 2025 – 2027 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.

Until a proposed rule is prepared and published, 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 herring resource and, therefore, represents an improvement over previously available information. This document will be subject to public comment through proposed rulemaking, 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 proposed rule and 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 purposes of the Pre-Dissemination Review, this document is 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. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Northeast Region Coordinating Council (NRCC) stock assessment process or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish Plan Development Team. Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Preferred Alternative were conducted using information from the most recent complete calendar years, through 2023, and in some cases includes information that was collected during the first eight months of calendar year 2024. Complete data were not available for calendar year 2024. The data used in the analyses provide the best available information on the number of harvesters in the fishery, the catch

(including landings and discards) by those harvesters, the sales and revenue of those landings to dealers, the type of permits held by vessels, the number of DAS used by those vessels, the catch of recreational fishermen and the location of those catches, and the catches and revenues from various special management programs. 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 groundfish fishery. The policy choices are clearly articulated, in Section 4.0 of this document, as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are 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 Council review process involves public meetings at which affected stakeholders have 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 SSC to review the background science and assessment to approve the Overfishing Limits (OFLs) and 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, NMFS, 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 Areas)

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 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 groundfish 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 Northeast Multispecies FMP are unlikely to damage shipwrecks and other cultural artifacts because fishing vessel operators avoid contact with cultural resources on the seafloor to minimize costly gear losses and interruptions to fishing.

7.10 Executive Order 13132 (Federalism)

Executive Order 131321 on federalism established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in this action, thus preparation of an assessment under EO 13132 is unwarranted. The affected states have been closely involved in the development of the proposed action through their representation on the Council; 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 Regulatory Impact Review

This Regulatory Impact Review (RIR) is framed around the preferred alternatives for this action.

7.11.1 Regulatory Flexibility Act – 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."

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration (SBA) that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities.

Description and estimate of the number of small entities to which the rule applies

As of June 1, 2024, NMFS had issued 669 commercial limited-access groundfish permits associated with vessels (including those in confirmation of permit history, CPH), 719 party/charter groundfish permits, 696 limited access and general category Atlantic sea scallop permits, 761 small-mesh multispecies permits, 71 Atlantic herring permits, and 743 large-mesh non-groundfish permits (limited access summer flounder and scup permits). Therefore, 3,659 permits are potentially regulated by this action. When accounting for overlaps between fisheries, this number falls to 2,144 permitted vessels. Each vessel may be individually owned or part of a larger corporate ownership structure, and for RFA purposes, it is the ownership entity that is ultimately regulated by the proposed action. Ownership entities are identified on June 1st of each year based on the list of all permit numbers, for the most recent complete calendar year, that have applied for any type of Northeast Federal fishing permit. The current ownership data set is based on calendar year 2023 permits and contains gross sales associated with those permits for calendar years 2019 through 2023.

For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide. The determination as to whether the entity is large or small is based on the average annual revenue for the five years from 2019 through 2023. The Small Business Administration (SBA) has established size standards for all other major industry sectors in the U.S., including for-hire fishing (NAICS code 487210). These entities are classified as small businesses if combined annual receipts are not in excess of $8.0 million for all its affiliated operations. As with commercial fishing businesses, the annual average of the five most recent years (2019-2023) is utilized in determining annual receipts for businesses primarily engaged in for-hire fishing.

Ownership data collected from permit holders indicates that there are 1,648 distinct business entities that hold at least one permit regulated by the proposed action. All 1,648 business entities identified could be directly regulated by this proposed action. Of these 1,648 entities, 891 are commercial fishing entities, 326 are for-hire entities, and 431 did not have revenues (were inactive in 2023). Of the 891 commercial fishing entities, 881 are categorized as small entities and 10 are categorized as large entities, per the NMFS guidelines. Furthermore, 412 of these commercial fishing entities held limited access groundfish permits, with 408 of these entities being classified as small businesses and 4 of these entities being classified as large businesses. All 326 for-hire entities are categorized as small businesses.

Summary of the Proposed Action and significant alternatives

As outlined in Section 3.2, the purpose of this action is to implement Amendment 25 to the Northeast Multispecies FMP. Amendment 25 would incorporate the revised Atlantic cod stock units, as identified in the 2023 Atlantic Cod Research Track Assessment, into the Northeast Multispecies FMP, and set groundfish fishery specifications for the four revised Atlantic cod stocks for fishing year 2026 (May 1, 2026, through April 30, 2027). The recreational groundfish fishery would be impacted by the setting of new sub-allocations of WGOM cod and SNE cod. Amendment 25 would include a number of other changes to the groundfish fishery beyond specifications including: new status determination criteria for cod stocks; updates to cod management measures outside of specifications, and recreational management measures for cod.

Description and estimate of economic impacts on small entities, by entity size and industry

The proposed action, under all the preferred alternatives in Section 4.0, is estimated to generate $34.7 million in sector revenue from the catch of multispecies groundfish, $51.7 million in total revenue from all fish caught on sector groundfish trips, and $33.9 million in operating profit from sector groundfish trips. Under No Action, sector revenue and operating profit could not be estimated due to a lack of specifications for Atlantic cod stocks for the upcoming fishing year. As described above, the vast majority of entities with limited access groundfish permits are classified as small businesses. Small entities engaged in the commercial sector groundfish fishery will be positively impacted by the proposed action relative to No Action. Sectors comprised 99% of commercial groundfish landings and revenue in recent fishing years. Small entities engaged in the common pool component of the commercial groundfish fishery are expected to be positively impacted by the proposed action as well, relative to No Action.

While the overall proposed action is predicted to result in positive impacts to the commercial groundfish fishery relative to No Action, revenues and operating profits are predicted to decrease relative to realized FY2023 values. Sector groundfish revenues are predicted to decline by $7.0M (16.8%) and operating profits are predicted to decline by $5.4M (13.7%) relative to FY2023.

In terms of the recreational groundfish fishery, the WGOM cod and SNE cod recreational sub-ACLs would be defined under the proposed action. These cod sub-ACLs would not be defined under No Action, meaning the proposed action will positively impact the recreational fishery relative to No Action. However, relative to FY2023, the proposed action will negatively impact the recreational groundfish fishery given a zero possession limit on SNE cod. While recreational measures for WGOM cod in FY2026 will be set outside of Amendment 25, the measures would be based on achieving but not exceeding the recreational sub-ACL set by Amendment 25, after consultation with the Council.

Recreational measures for other cod stocks (EGOM and GB) would be set to create consistency between stock areas.

Summary and Conclusions

The purpose of this action is to implement Amendment 25 to the Northeast Multispecies FMP. Amendment 25 would incorporate the four revised Atlantic cod stock units into the FMP and revise groundfish fishery specifications for fishing year 2026 (May 1, 2026, through April 30, 2027) for four Atlantic cod stocks. The setting of specifications can potentially impact other fisheries in the region that have sub-ACLs for groundfish stocks.

The proposed action is estimated to generate $34.7 million in sector revenue from the catch of Multispecies groundfish, $51.7 million in total revenue from all fish caught on sector groundfish trips, and $33.9 million in operating profit from sector groundfish trips. Under No Action, sector revenue and operating profit for the upcoming fishing year cannot be estimated due to a lack of specifications for Atlantic cod stocks. Small entities engaged in the commercial sector groundfish fishery will therefore be positively impacted by the proposed action, relative to No Action. Small entities engaged in common pool groundfish fishing are expected to be positively impacted by the proposed action as well. However, relative to FY2023, the commercial groundfish fishery will be negatively impacted by the proposed action. The decline in fishery revenue and operating profit is estimated to be ~15% relative to FY2023 values.

Similar to the commercial groundfish fishery, the recreational groundfish fishery will be positively impacted by the proposed action relative to No Action. Relative to FY2023, small entities engaged in the recreational groundfish fishery will be negatively impacted by the proposed action. While estimated value changes are not available for the recreational fishery, a zero possession limit on SNE cod will create negative impacts. Recreational measures for WGOM cod for FY2026 will be set outside of Amendment 25.

7.11.2 E.O. 12866 (Regulatory Planning and Review)

<u>Determination of significance under E.O. 12866</u>

The purpose of E.O. 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section 7.12 of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action in accordance with the guidelines established by E.O. 12866. NMFS guidelines provide criteria to be used to evaluate whether a proposed action is significant.

E.O. 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a "significant regulatory action" means any regulatory action that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more[53]*, or adversely effect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities;*

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

[53] All monetary values are reported in 2023 dollars using the GDP deflator.

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Section 6.5 presents detailed economic analyses for the proposed action alternatives. These analyses are summarized below, with references to relevant tables in Section 6.5. Together, the economic analysis included in Section 6.5 and this RIR demonstrate that the proposed action is not significant under E.O. 12866, as it will not have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy or a sector of the economy, productivity, jobs, the environment, public health, or safety, or State, local, or tribal governments or communities.

Objectives

The goals and objectives of Revised Amendment 25 to the Northeast Multispecies FMP are consistent with the goals of the original FMP, which are as follows:

Goal 1: *Consistent with the National Standards and other required provisions of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable law, manage the northeast multispecies complex at sustainable levels.*

Goal 2: *Create a management system so that fleet capacity will be commensurate with resource status so as to achieve goals of economic efficiency and biological conservation and that encourages diversity within the fishery.*

Goal 3: *Maintain a directed commercial and recreational fishery for northeast multispecies.*

Goal 4: *Minimize, to the extent practicable, adverse impacts on fishing communities and shore-side infrastructure.*

Goal 5: *Provide reasonable and regulated access to the groundfish species covered in this plan to all members of the public of the United States for seafood consumption and recreational purposes during the stock rebuilding period without compromising the Amendment 13 objectives or timetable. If necessary, management measures could be modified in the future to insure that the overall plan objectives are met.*

Goal 6: *To promote stewardship within the fishery.*

Objective 1: *Achieve, on a continuing basis, optimum yield (OY) for the U.S. fishing industry.*

Objective 2: *Clarify the status determination criteria (biological reference points and control rules) for groundfish stocks so they are consistent with the National Standard guidelines and applicable law.*

Objective 3: *Adopt fishery management measures that constrain fishing mortality to levels that are compliant with the Sustainable Fisheries Act.*

Objective 4: *Implement rebuilding schedules for overfished stocks, and prevent overfishing.*

Objective 5: *Adopt measures as appropriate to support international trans-boundary management of resources.*

Objective 6: *Promote research and improve the collection of information to better understand groundfish population dynamics, biology and ecology, and to improve assessment procedures in cooperation with the industry.*

Objective 7: *To the extent possible, maintain a diverse groundfish fishery, including different gear types, vessel sizes, geographic locations, and levels of participation.*

Objective 8: *Develop biological, economic and social measures of success for the groundfish fishery and resource that insure accountability in achieving fishery management objectives.*

Objective 9: *Adopt measures consistent with the habitat provisions of the M-S Act, including identification of EFH and minimizing impacts on habitat to the extent practicable.*

Objective 10: *Identify and minimize bycatch, which include regulatory discards, to the extent practicable, and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.*

Description

This Amendment will affect entities engaged in the following fisheries: commercial groundfish (sector and common pool), recreational groundfish, Atlantic sea scallop, Atlantic herring, small-mesh multispecies, and large-mesh non-groundfish (summer flounder and scup). Entities affected are defined here as individual permits engaged in these fisheries.

Problem Statement

The need and purpose of the actions proposed in this Amendment are explained in Section 3.2 of this document and are incorporated herein by reference.

Analysis of Alternatives

This section provides an analysis of each proposed alternative of revised Amendment 25 as mandated by E.O. 12866. The focus will be on the expected changes 1) in net benefits and costs to entities engaged in the groundfish fishery, 2) changes to the distribution of benefits and costs within the industry, 3) changes in income and employment, 4) cumulative impacts of the regulation, and 5) changes in other social concerns. Much of this information is captured already in the detailed economic impacts and social impacts analyses of Section 6.5 and Section 6.6 of this document.

This RIR will summarize and highlight the major findings of the economic impacts analysis provided in Section 6.5 of this document, as mandated by E.O. 12866. When assessing net benefits and costs of the proposed FY2025 specifications, it is important to note that the analysis will focus on impacts to producers and fishing businesses. Consumer surplus is not expected to be substantially affected by any of the regulatory changes proposed in Amendment 25.

Impacts on entities engaged in the sector and common pool components of the commercial groundfish fishery, the recreational groundfish fishery, the Atlantic sea scallop fishery, the Atlantic herring fishery, the small-mesh multispecies fishery, and the large-mesh non-groundfish fisheries are analyzed separately where appropriate.

A detailed description of the alternatives under consideration can be found in Section 4.0 of this document.

Action #1: Incorporating Revised Atlantic Cod Stock Units into the Northeast Multispecies FMP

Preferred Alternative – Alternative 3: Revise Atlantic Cod Stock Units in FMP

Under the Preferred Alternative, the four revised Atlantic cod stock units would be incorporated into the FMP. There are no economic impacts, direct or indirect, as the impacts are determined from the implementing measures in Actions 2-5.

Action #2: Atlantic Cod Status Determination Criteria

Preferred Alternative- Alternative 2: New Status Determination Criteria for Cod Stocks

Entities engaged in the commercial groundfish fishery

Under the Preferred Alternative, new SDCs would be adopted for the four Atlantic cod stock units. In the short-term, economic impacts could be positive or negative, since SDCs are needed to specify OFLs, ABCs, and ACLs, and these levels of catch may be lower than the fishery has experienced. In the long-term, Alternative 2 is expected to have positive economic impacts, since adopting SDCs for the four new Atlantic cod stocks according to the most recent scientific assessments decreases the likelihood of overfishing or the stock becoming overfished over the long run, which allows for increased fishery revenues. Overall, Alternative 2 is expected to have low positive economic impacts. Compared to Alternative 1/No Action, economic impacts are expected to be positive.

Action #3: Revised Specifications

Preferred Alternative- Alternative 2: Revised Specifications

Preferred Alternative- Alternative 3: Southern New England Cod Recreational Sub-ACL (Option 2– Set Southern New England Cod Recreational Sub-ACL)

Entities engaged in the sector component of the commercial groundfish fishery

Under the Preferred Alternatives, predicted groundfish revenue is $34.7M, representing a $7.0M decrease relative to FY2023. Predicted operating profit is $33.9M, representing a $5.4M decrease relative to FY2023. Costs included in the operating profit calculation are fuel, sector fees, and quota costs, including opportunity cost of quota.

As Atlantic cod stocks would not have specifications under No Action, fishery revenues and operating profits are unable to be estimated under Alternative 1. Given the lack of cod sector sub-ACLs under No Action, entities engaged in the sector groundfish fishery would be positively impacted under Alternative 2 relative to No Action. Impacts by port and vessel size class under Alternative 2 can be found in Section 6.5.3.2.

Entities engaged in the common pool component of the commercial groundfish fishery

The four Atlantic cod stocks (WGOM cod, EGOM cod, GB cod, and SNE cod) would not have FY2026 ACLs specified under Alternative 1/No Action. For these stocks, there would be no specifications and therefore would have negative impacts on the common pool fishery under Alternative 1/No Action relative to Alternative 2. Therefore, Alternative 2 would have positive economic impacts on the common pool relative to No Action.

Entities engaged in the recreational groundfish fishery

Under the Preferred Alternatives, impacts on the recreational groundfish fishery would be positive relative to No Action since allocations would be established for WGOM cod and SNE cod. However, recreational groundfish entities may be negatively impacted relative to FY2023 given the size of these cod allocations. WGOM cod recreational management measures, designed to constrain catch below the sub-ACL, will be set outside of Amendment 25. SNE cod recreational management measures, and their impacts, are discussed under Action 5.

Action #4: Commercial Management Measures – Atlantic Cod

Preferred Alternative- Alternative 1: Common Pool Accountability Measures for Cod Stocks (Option 2– Common Pool Trimester Total Allowable Catch (TAC) Distributions and Closure Areas for Cod Stocks; Option 3– Common Pool Baseline Trip Limits for Cod Stocks)

Entities engaged in the commercial groundfish fishery

Under the Preferred Alternative, common pool trimester TAC distributions and trimester TAC closure areas would be adopted for the four revised Atlantic cod stocks. Option 2 would reduce the risk of the common pool exceeding sub-ACLs for the four new cod stocks. When compared to Option 1/No Action, Option 2 could have positive economic impacts on the sector fishery and recreational fishery, but mixed (positive, negative, neutral) economic impacts on the common pool fishery. Using the most recent five years of data to determine the distribution could have positive economic impacts on the common pool fishery as it would be consistent with recent fishing effort. In addition, the updated trimester closure areas for the common pool may offer fishing opportunities outside of the closures for other groundfish stocks like haddock, pollock, and flatfish. On the other hand, having four cod stocks (rather than two cod stocks) could lead to more frequent common pool closures which would have negative economic impacts on the common pool fishery.

Option 3 would establish baseline common pool trip limits for the revised Atlantic cod stock units. Option 3 would reduce the risk of the common pool exceeding sub-ACLs for the four new cod stocks. When compared to Option 1/No Action, Option 3 could have positive economic impacts on the sector fishery and recreational fishery, but mixed (positive, negative, neutral) economic impacts on the common pool fishery.

Action #5: Recreational Fishery Management Measures – Atlantic Cod

Preferred Alternative- Alternative 1: Recreational Fishing Measures for Southern New England Cod (Option 2– Recreational Fishing Measures for Southern New England Cod)

Preferred Alternative- Alternative 2: Regulatory Process for Regional Administrator to Adjust Recreational Measures for Cod Stocks (Option 2– Establish a Regulatory Process for the Regional Administrator to Adjust Recreational Measures for Eastern Gulf of Maine Cod and Georges Bank Cod)

Entities engaged in the recreational groundfish fishery

Under Preferred Alternative 1, the federal recreational fishery would be prohibited from landing SNE cod. The effect of this closure on the overall cod encounter rate is difficult to determine, as many anglers that catch cod are fishing for other species (e.g., tautog). The cod encounter rate would likely remain relatively unchanged for anglers targeting other species but would decline to some degree for anglers that target cod under a zero-possession limit. Anglers in the latter category would eliminate their targeting behavior but would still likely encounter cod while fishing for alternative species. The possibility also exists that anglers with strong preferences for cod could reduce or eliminate their fishing activity altogether further reducing cod encounters. Ultimately, both anglers and for-hire businesses will incur some negative impacts because of an inability to catch cod. The exact magnitude of impacts is difficult to quantify but the severity will largely depend on how much value anglers place on cod fishing opportunities.

The preference to target certain species is a product of many factors. As cod has deep-rooted history in the recreational fishery, it is likely that some anglers will be turned away from fishing to a certain extent if cod fishing is not an option. Difference in state waters regulations and federal waters regulations could also impact anglers' choices. Bait and tackle shops, marinas, and other shore-side businesses would also incur losses if fewer anglers chose to participate.

In the short term, the concern of overfishing would be lower with the recreational fishery having zero-possession of cod. The long-term impacts of Option 2 are uncertain as recreational anglers will not be able to land SNE cod in federal waters where they previously could do so, but the foregone cod landings may, or may not, rebuild the stock. Long term impacts could be positive if the ability of the SNE cod stock to recover is improved by restricting recreational landings, which would positively impact the commercial and recreational fisheries. The stock rebuilding potential of this option will likely also be mitigated by any differences in federal and state regulations, and noncompliance, though those illegally landing cod would be receiving the same benefits as under No Action.

Preferred Alternative 2 is administrative resulting in neutral economic impacts on the commercial fishery and recreational fishery relative to Option 1. If the NMFS/Council consultation process includes consideration of the recommendations of the Recreational Advisory Panel, it could lead to positive social benefits for the recreational cod fishery participants in EGOM and GB with respect to the process of management decisions.

Summary of expected economic impacts from implementation of Amendment 25 proposed action

The regulations proposed in Amendment 25 are expected to have a positive impact on gross revenues and operating profits for entities engaged in the commercial groundfish fishery relative to No Action. Under No Action, specifications would not be in place for the four cod stocks (EGOM, WGOM, GB, SNE) in FY2026.

However, entities engaged in the commercial groundfish fishery are expected to be negatively impacted under the proposed action relative to recent fishing years. Predicted sector groundfish revenue under the revised specifications is $34.7 million, a decline of $7.0 million (16.8%) relative to FY2023 realized revenue. Predicted sector operating profit under the revised specifications is $33.9 million, a decline of $5.4 million (13.7%) relative to FY2023.

Similar to the commercial groundfish fishery, entities engaged in the recreational groundfish fishery will be positively impacted by the proposed action relative to No Action. However, relative to FY2023, the recreational fishery will be negatively impacted by low cod sub-ACLs and a zero possession limit on SNE cod.

Determination of Significance

The proposed action does not constitute a significant regulatory action under EO 12866 for the following reasons: the proposed action will not have an annual effect on the economy of more than $100 million. Adverse impacts on fishermen and fishing businesses, ports, recreational anglers, and operators of party/charter businesses are not expected to be substantial.

In addition, there should be no interactions with activities of other agencies and no impacts on entitlements, grants, user fees, or loan programs. The proposed action does not raise novel legal or policy issues. As such, the Proposed Action is not considered significant as defined by EO 12866.

8.0 GLOSSARY

Adult stage: One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect: Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation: A group of animals or plants occurring together in a particular location or region.

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Annual Catch Entitlement (ACE): Pounds of available catch that can be harvested by a particular sector. Based on the total PSC for the permits that join the sector.

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship S=1-A.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Biomass: The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1+, ages 4+ 5, etc.). See also spawning stock biomass, exploitable biomass, and mean biomass.

BMSY: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to FMSY. For most stocks, BMSY is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ BMSY, depending on the species.

Bthreshold: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc.). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below Bthreshold. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve Btarget as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, Bthreshold is often defined as either 1/2BMSY or 1/4 BMSY. Bthreshold is also known as Bminimum.

Btarget: A desirable biomass to maintain fishery stocks. This is usually synonymous with BMSY or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1+ biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3+ biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

Biota: All the plant and animal life of a particular region.

Bivalve: A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom tending mobile gear: All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

Bycatch: (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch: The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment: Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Continental shelf waters: The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (BMSY or proxy) as a management objective. The biomass threshold (Bthreshold or Bmin) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

Demersal species: Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

Discards: animals returned to sea after being caught; see Bycatch (n.)

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterized by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the larval or juvenile stage.

Emergent epifauna: See Epifauna. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See Benthic infauna. Epifauna are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

Fathom: A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

F0.1: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

FMAX: a fishing mortality rate that maximizes yield per recruit. FMAX is less conservative than F0.1.

FMSY: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

Fthreshold: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses FMSY or FMSY proxy for Fthreshold. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Fishing effort: the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with structure-forming organisms, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush- like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See epifauna. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the egg or larval stage and the adult stage; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

Landings: The portion of the catch that is harvested for personal use or sold.

Larvae stage: One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the egg for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages, and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Macrobenthos: See Benthic community and Benthic infauna. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A50 is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1+ mean biomass; mean biomass summed across ages 3 and over is 3+ mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

Minimum spawning stock threshold: the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Mollusks: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

Multispecies: the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Northeast Shelf Ecosystem: The Northeast U.S. Shelf Ecosystem has been described as including 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.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

Observer: any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

Overfished: A condition defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing: A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Potential Sector Contribution (PSC): The percentage of the available catch a limited access permit is entitled to after joining a sector. Based on landings history as defined in Amendment 16. The sum of the PSC's in a sector is multiplied by the groundfish sub-ACL to get the ACE for the sector.

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. "Recruitment" also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, yellowtail flounder, winter flounder, witch flounder, American plaice, white hake, pollock, redfish, Atlantic halibut, windowpane flounder, ocean pout, and wolffish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Scavenging species: An animal that consumes dead organic material.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

Sediment: Material deposited by water, wind, or glaciers.

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See Motile and Mobile organisms. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See adult stage. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See Species diversity. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be "highly" or "moderately" vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to Bthreshold (defines overfished) and Fthreshold (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

Stock: A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Stock assessment: determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock of concern: a regulated groundfish stock that is overfished, or subject to overfishing.

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See biogenic habitats.

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB): an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Taxa: The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a "target" (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

Total mortality: The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

Yearclass: also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

Z: instantaneous rate of total mortality. The components of Z are additive (i.e., Z = F+M)

Zooplankton: See Phytoplankton. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

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