Amendment 25 (Revised)

to the

Northeast Multispecies Fishery Management Plan

Appendix VI

Affected Environment:
Regulated Groundfish Species, Non-Groundfish Species/Bycatch, Physical Environment and Essential Fish Habitat, Protected Resources, and Human Communities

This appendix includes the Affected Environment (Section 5.0) of Amendment 25: descriptions of the regulated groundfish species, non-groundfish species/bycatch, the physical environment and Essential Fish Habitat (EFH), protected resources, and human communities.

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.

The Affected Environment descriptions of the regulated groundfish species, non-groundfish species/bycatch, the physical environment and Essential Fish Habitat (EFH), protected resources, and human communities are included in this appendix.

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

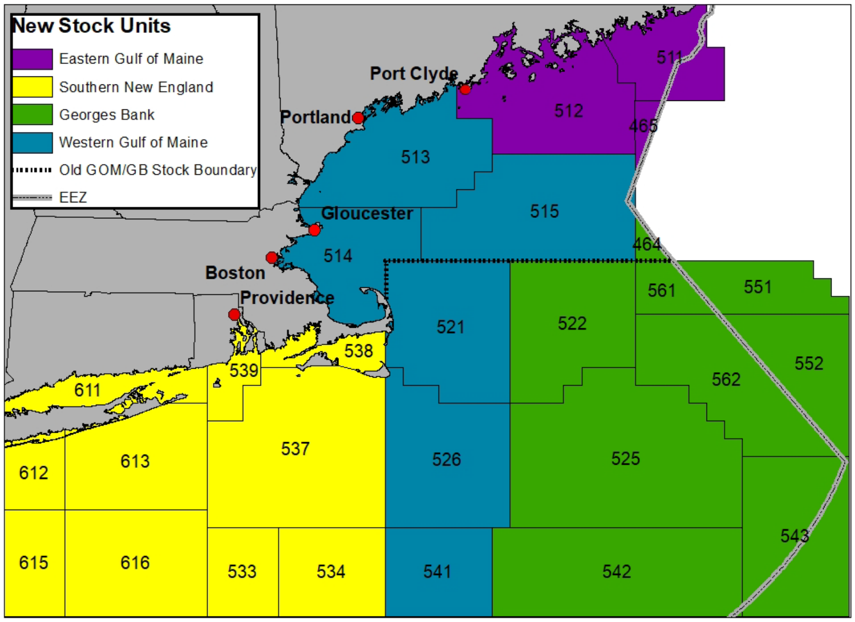
Life History. The Atlantic cod, *Gadus morhua*, is a demersal gadoid species found on both sides of the North Atlantic. In the western North Atlantic, cod occur from Greenland to North Carolina. The greatest concentrations of cod off the U.S. Northeast coast are on rough bottoms 33 - 492 ft (10 - 150 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 1).

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 1 – 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 1). 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 1). 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 1). 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 1). 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 1 summarizes the status of the northeast groundfish stocks as determined by NOAA Fisheries, noting which groundfish stocks are overfished or are experiencing overfishing.

Table 1 – 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
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 2 provides the status determination criteria (SDC) and Table 3 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 3.

Table 2 – 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
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 Alternatives Section 4.1).

Table 3 – 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
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 Alternatives Section 4.1).

5.2.21 Rebuilding Plan Status for Groundfish Stocks in Formal Rebuilding Plans

Table 4 summarizes the rebuilding status for each groundfish stock in a formal rebuilding plan.

Table 4 – 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 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%	Unknown

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?
					Exploitation Rate in 2023 = 3.4%	
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 0.76 (F_{MSY} proxy)	0.263 kg/tow in 2021, which is 5% of 4.94 kg/tow (SSB_{MSY})
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 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

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

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

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 5 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 5 vary slightly between the two studies. For further information on fish habitat relationships, see Table 6.

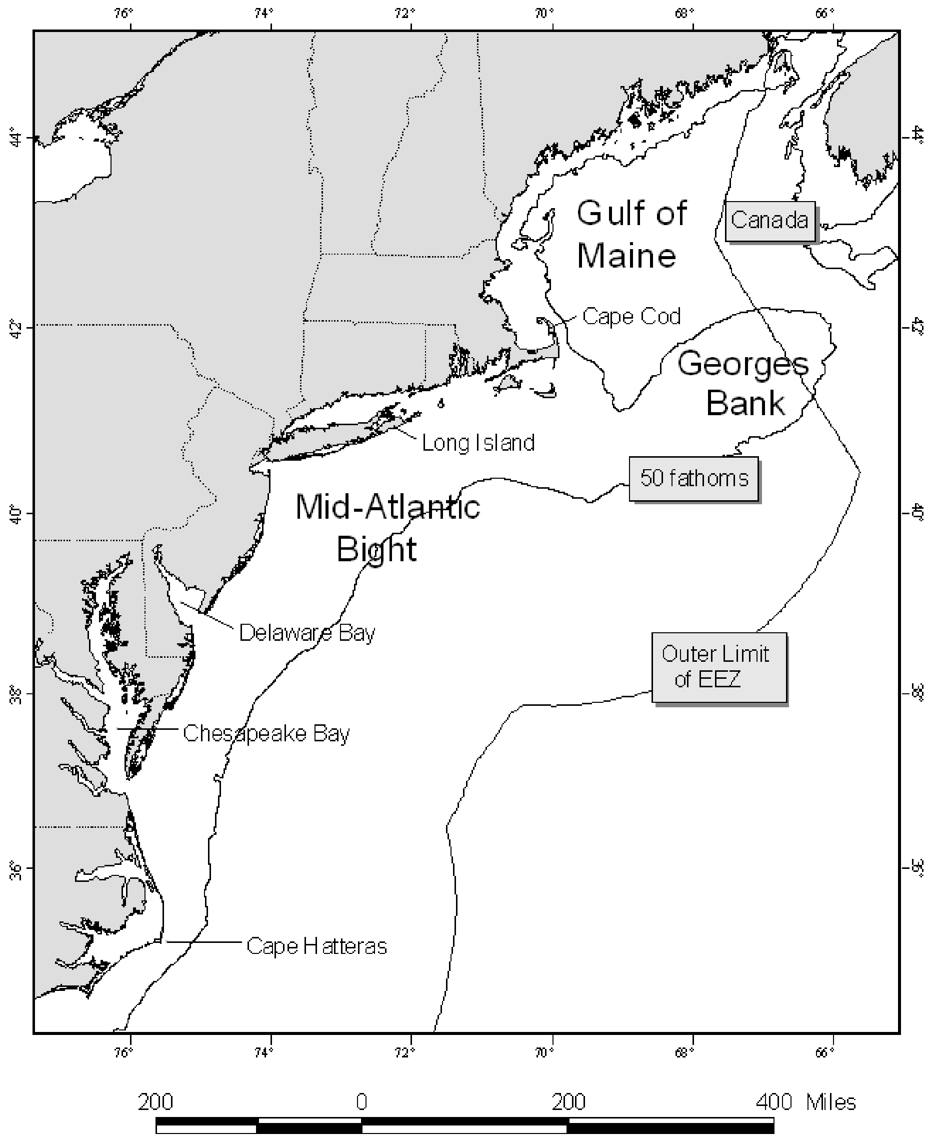
Table 5 – Comparison of Demersal Fish Assemblages of Georges Bank and the Gulf of Maine.

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.

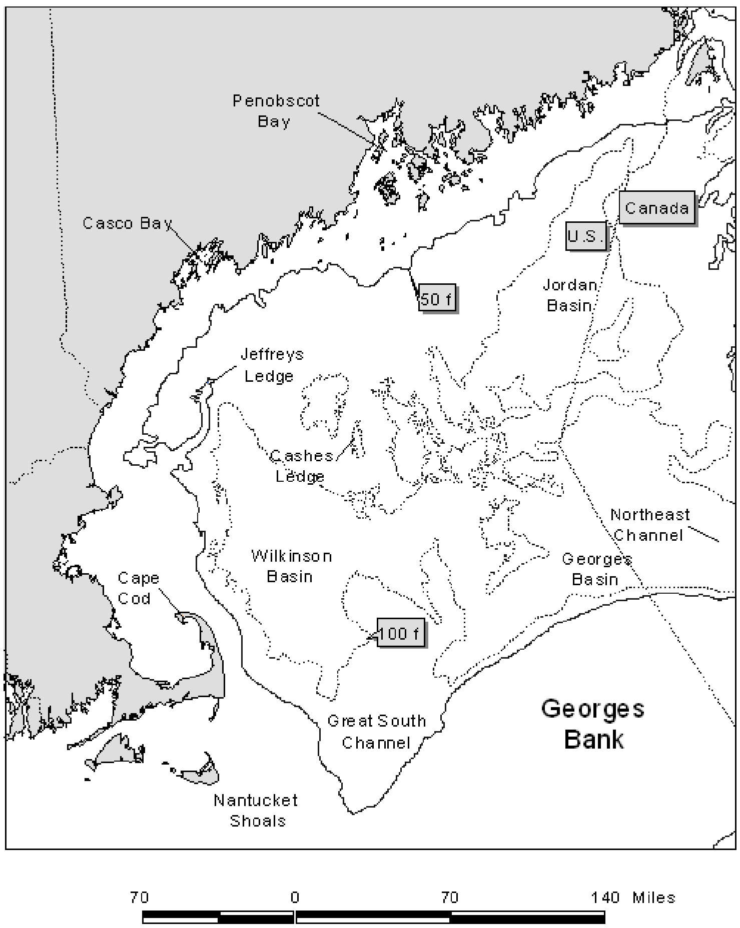
Map 1 – Northeast U.S. Shelf Large Marine Ecosystem. Source: Stevenson et al. (2004).



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. Through Framework 70, the Council is revising EFH designations for all life history stages of Atlantic cod. EFH designations for other groundfish stocks will be developed in a groundfish action in 2026. 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 6 - 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 7), 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 7 – 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 7). 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 7 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 7 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 7). 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 7). 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 8 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 8 – 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 7). 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 9 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 9 – 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 35ºN), SNE, GB, and GOM; however, most common in continental shelf waters from Hudson Canyon (~ 39ºN) 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*	**<u>Short- Finned Pilot Whales</u>** • 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). **<u>Long-Finned Pilot Whales</u>** • 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. **<u>Area of Species Overlap:</u>** 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 7). 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 10 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 10 – 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 7). 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 7). 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 7). 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 9 and Table 10 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 7, 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

[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).

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[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 11 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 11 – 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 this 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 12) [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 12 – Number of eligibilities (MRIs), eligibilities in CPH, permitted vessels, and active vessels (landing on groundfish trips) by fishing year from FY2019 to FY2023.

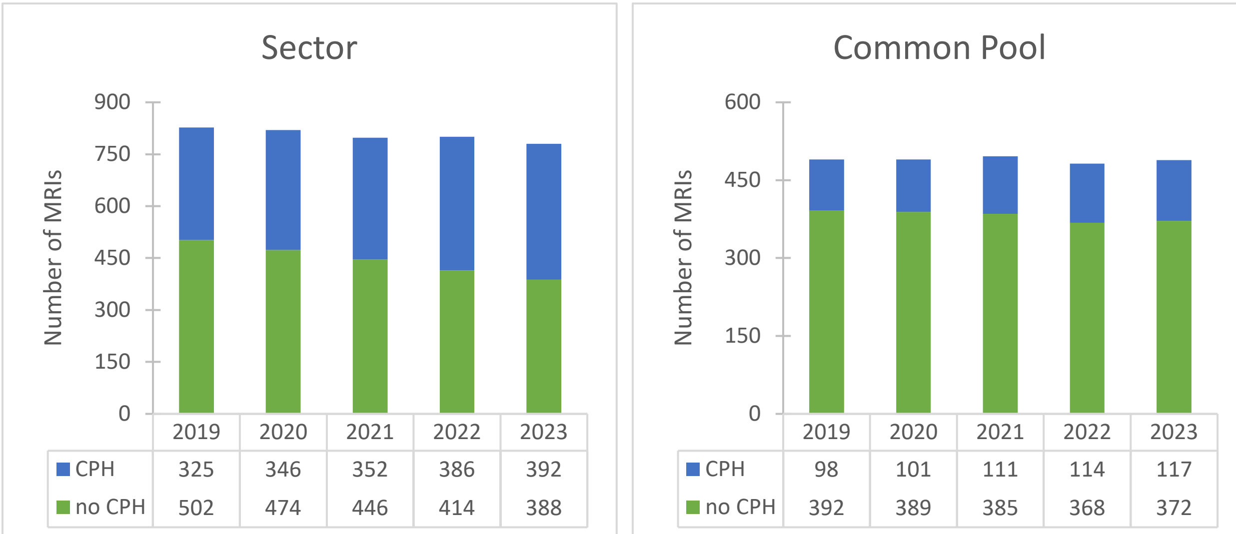
Fishing year	Group	MRIs	CPH	Elig. vessels	Not renewed	Permitted vessels	Any revenue	GF revenue	No landings	% inactive
2019	sector	827	325	543	15	528	349	157	179	34%
2019	common	490	98	401	24	377	272	43	105	28%
2020	sector	820	346	504	12	492	337	161	155	32%
2020	common	490	101	409	25	384	253	36	131	34%
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

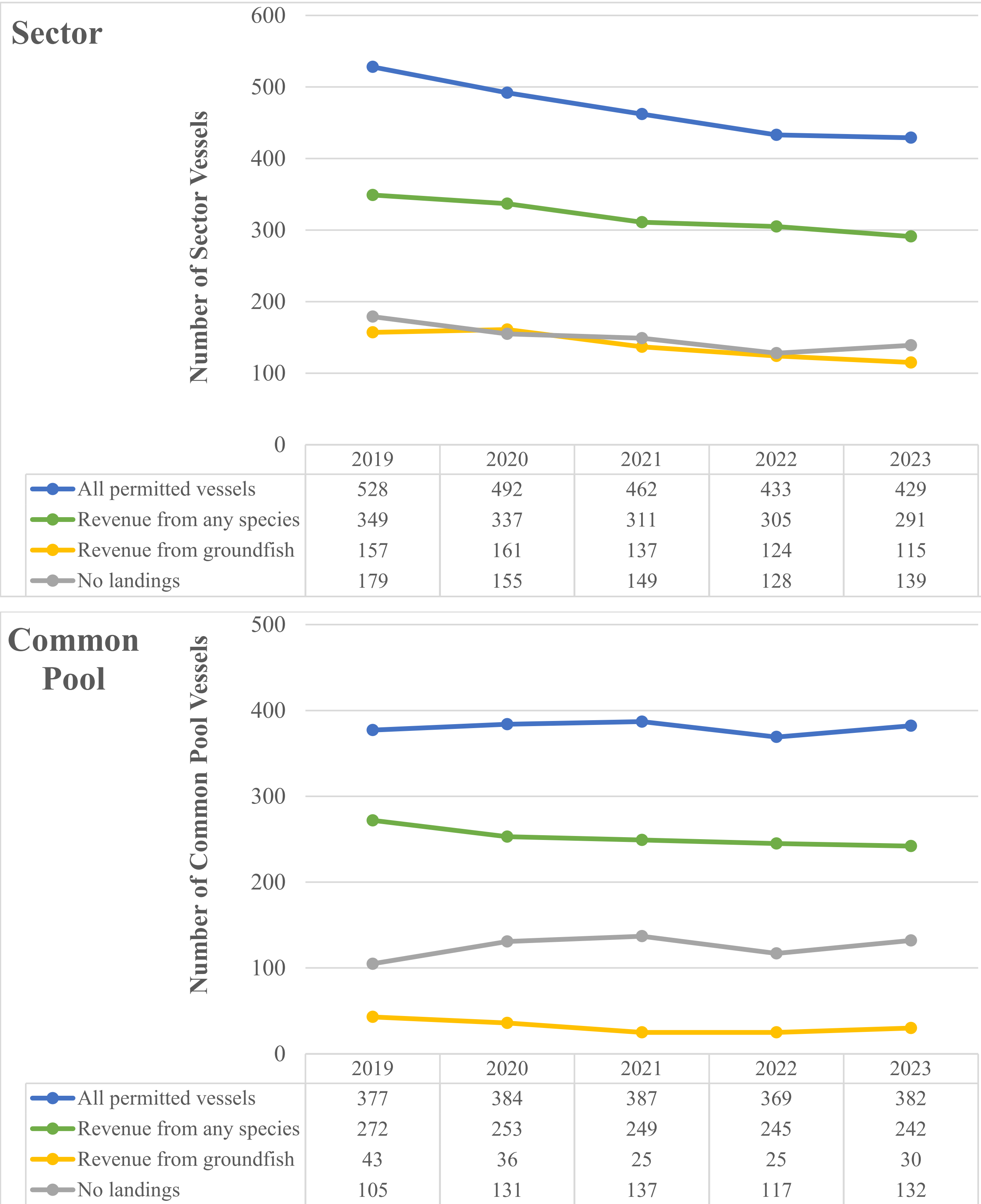
Over the past five fishing years, there has been limited variability in the number of groundfish eligibilities (Moratorium Right Identifiers, MRIs), shown in Table 12. This represents the number of individual fishing privileges and catch histories associated with each Northeast multispecies permit, through 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 2). 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 3). 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 2 – 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 3 – 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.



Sector

	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

Common Pool

	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 13). 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 4 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 14).

Table 13 – Number of active permitted vessels by length class, group and fishing year.

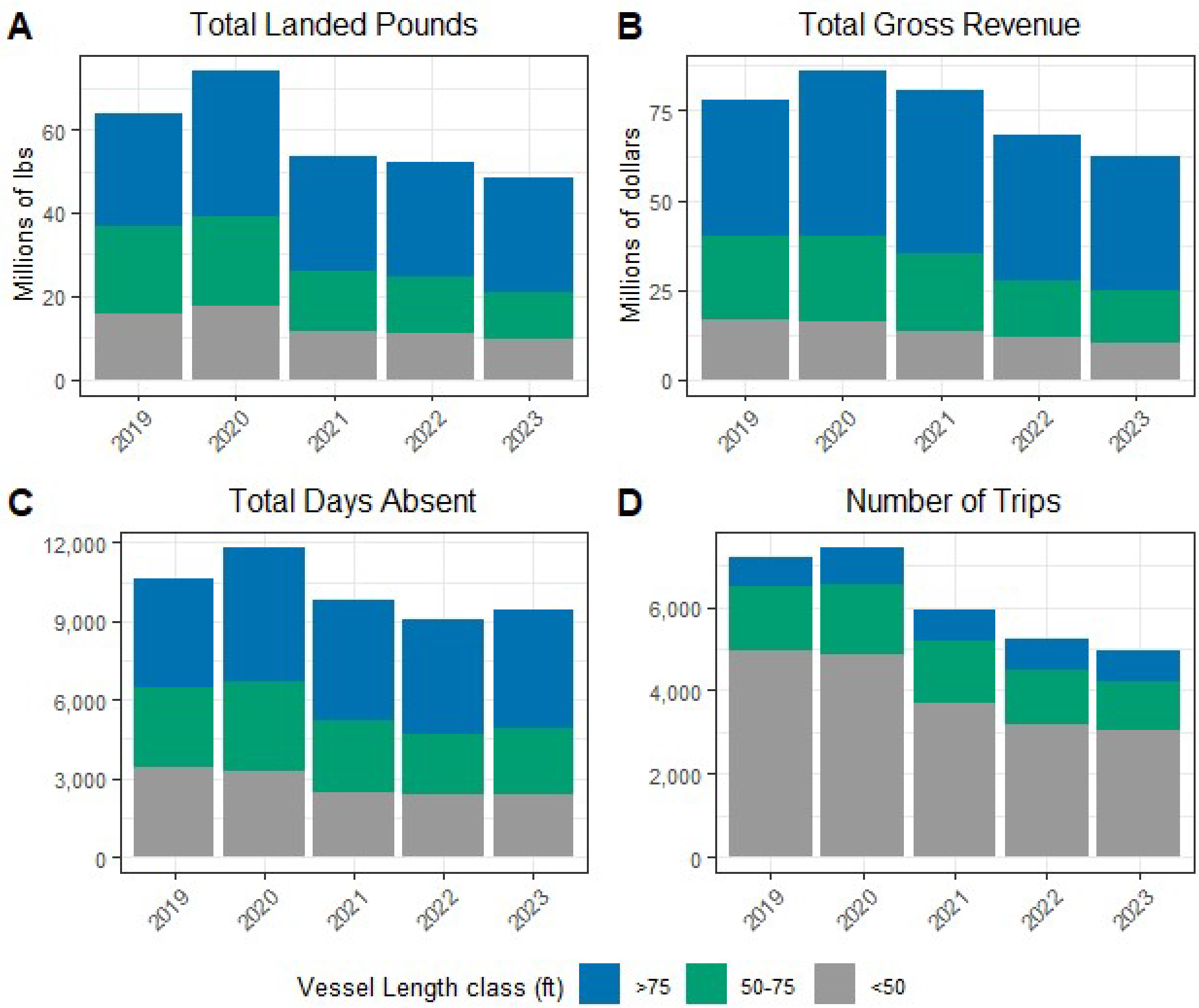
Fishing year	Group	<50 ft.	50-75 ft.	> 75 ft.
2019	common pool	35	6	0
2019	sector	92	47	28
2020	common pool	31	5	0
2020	sector	82	54	36
2021	common pool	26	4	0
2021	sector	72	45	30
2022	common pool	26	4	1
2022	sector	65	39	31
2023	common pool	28	6	0
2023	sector	60	32	32

"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 4 – 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 14 – 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.

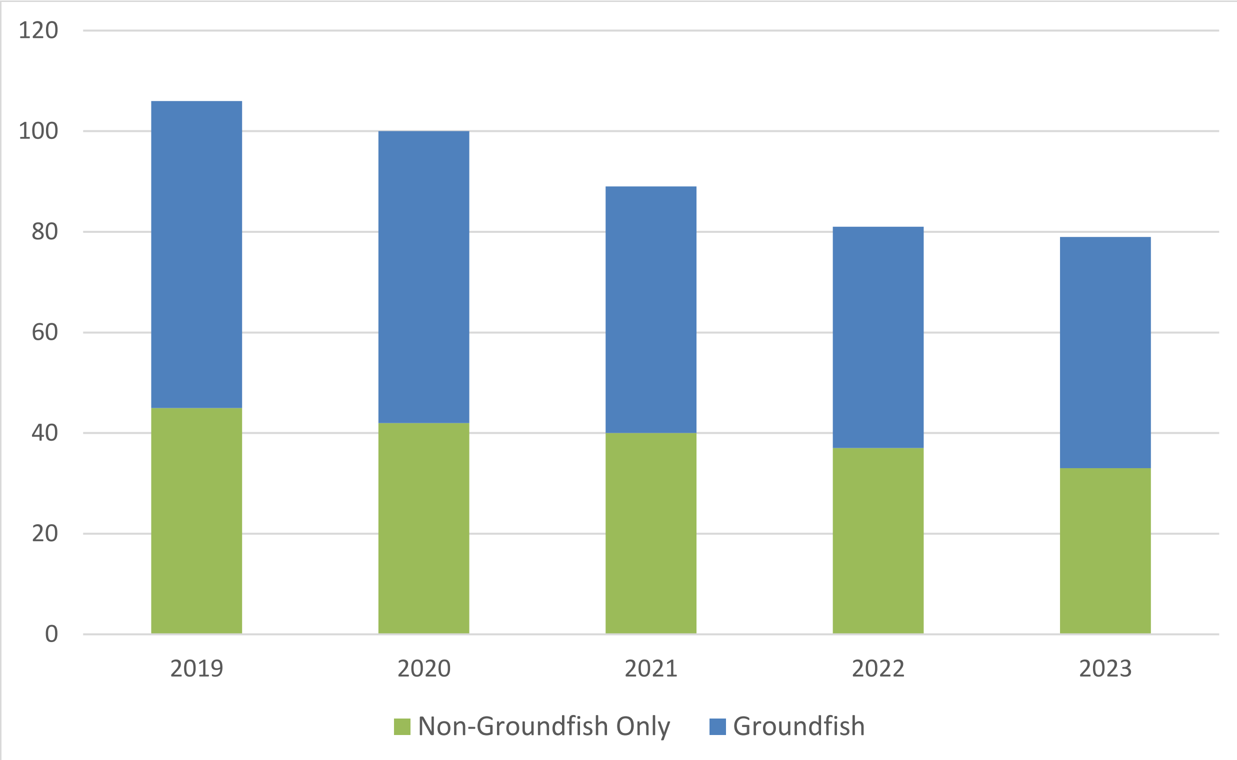
Source: CAMS data. Accessed October 2024

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 5).

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 15 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 5 – 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 15 – 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 16 and Figure 5 – Figure 7 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.

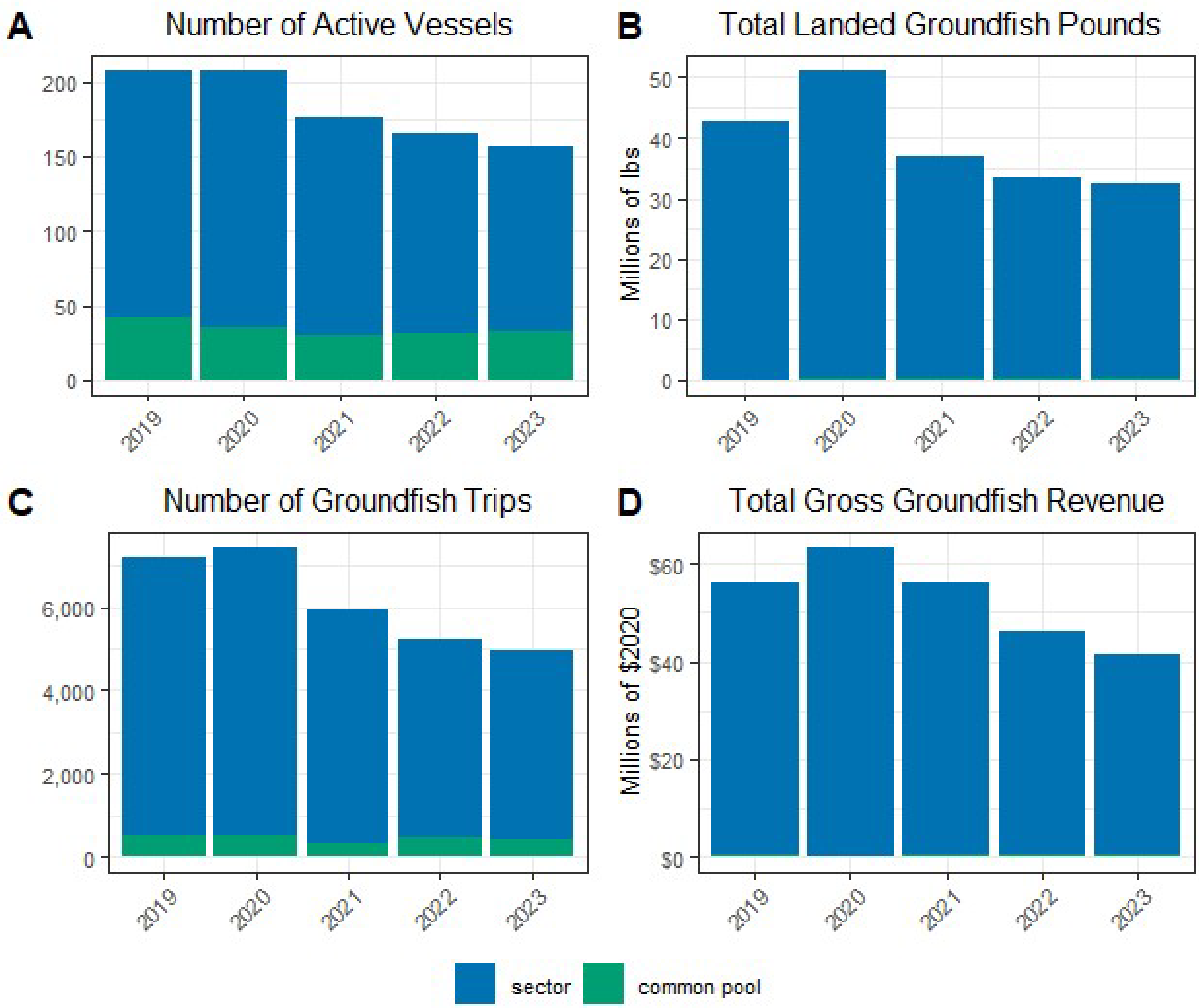
The average price of regulated groundfish landed on groundfish trips from sector vessels was $1.28/lb. in 2023, representing a decline relative to 2022. The average non-groundfish price for sector vessels increased in 2023 ($1.45/lb.) compared to 2022.

Table 16 – 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

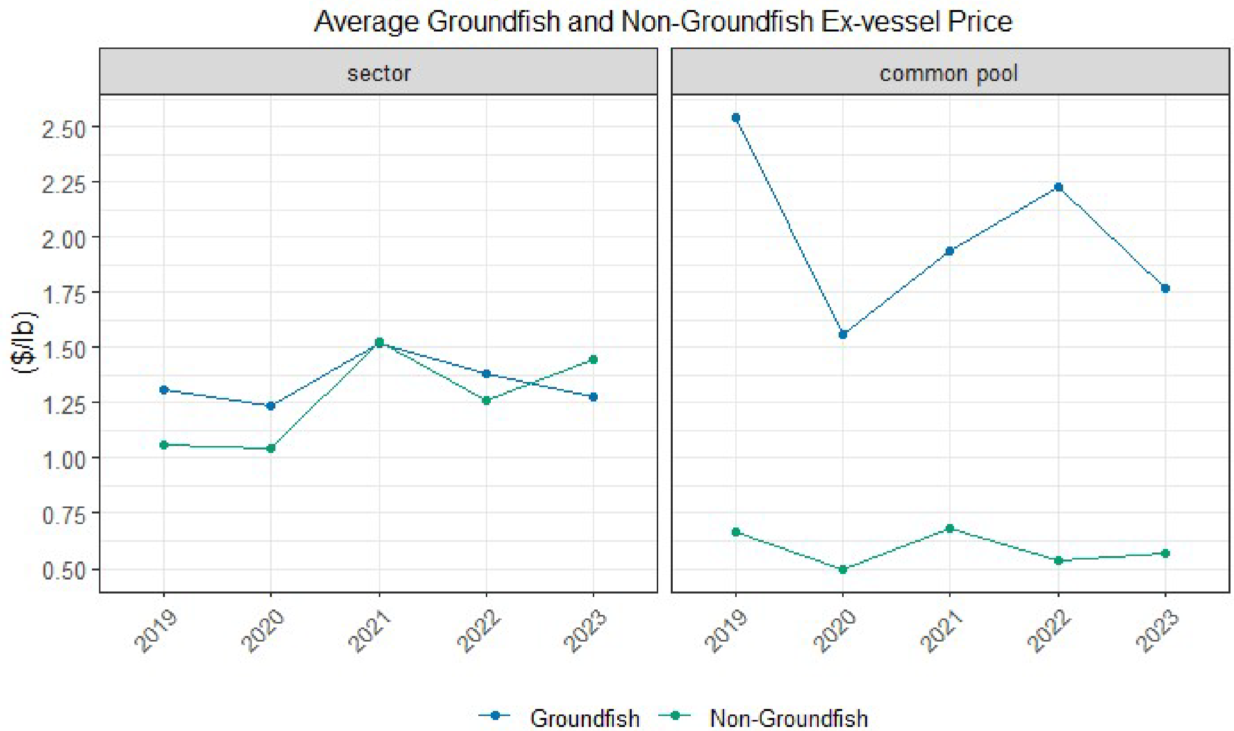
Source: CAMS data. Accessed October 2024

Figure 6 – (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 7 – Average groundfish and non-groundfish price ($2023) by fishing year.



Source: CAMS data. Accessed October 2024.

Table 17 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 18). More detailed information on groundfish landings and revenue by state is provided in Section 5.7.7.

Table 17 – 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 18 – 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 19 and revenue by stock in Table 20. Table 21 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 19 – 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 20 – Stock-level commercial (sector and common pool) revenue (millions of 2023$), FY2019 – 2023.

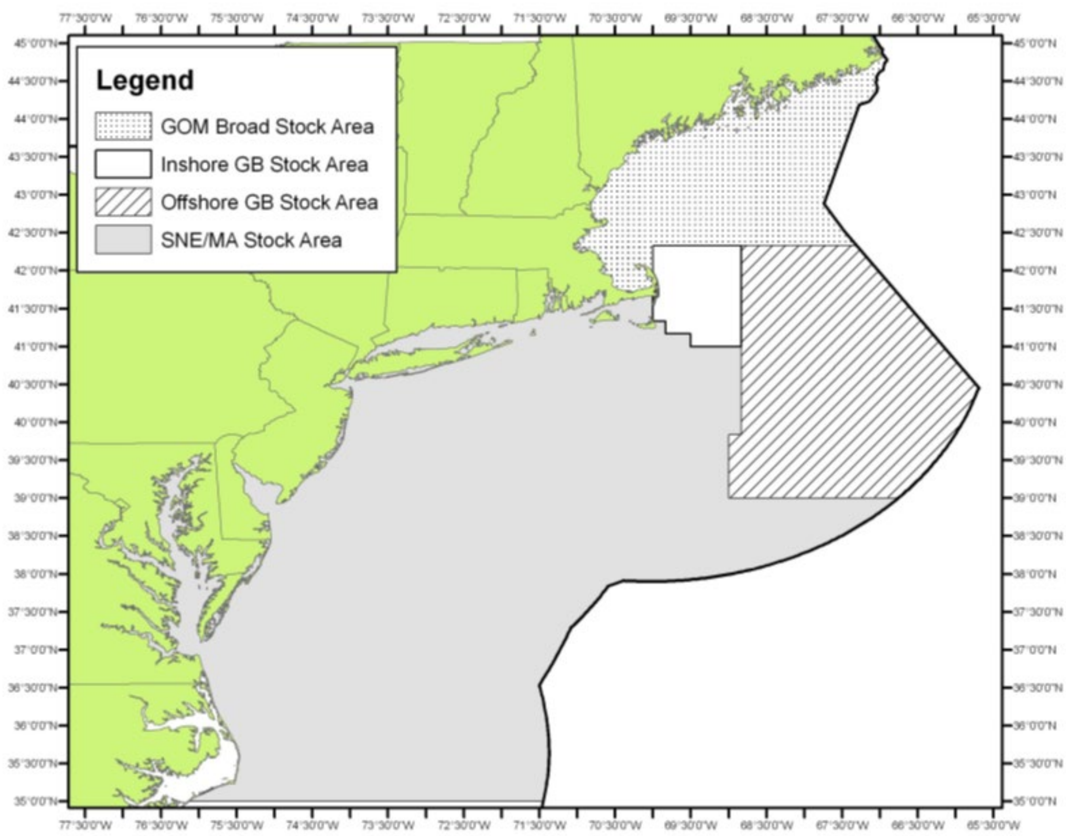
Stock	2019	2020	2021	2022	2023	Avg.
EGOM Cod	0.0	0.0	0.0	0.0	0.0	0.0
GB Cod	1.3	0.9	0.8	0.3	0.3	0.7
SNE Cod	0.0	0.0	0.0	0.0	0.0	0.0
WGOM Cod	3.6	2.6	2.5	1.5	1.9	2.4
GB Haddock	12.1	15.5	9.5	8.0	7.0	10.4
GOM Haddock	9.6	11.1	11.9	8.8	3.5	9.0
Halibut	0.4	0.4	0.3	0.2	0.2	0.3
White Hake	4.9	5.0	6.2	5.5	4.8	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 21 – 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.

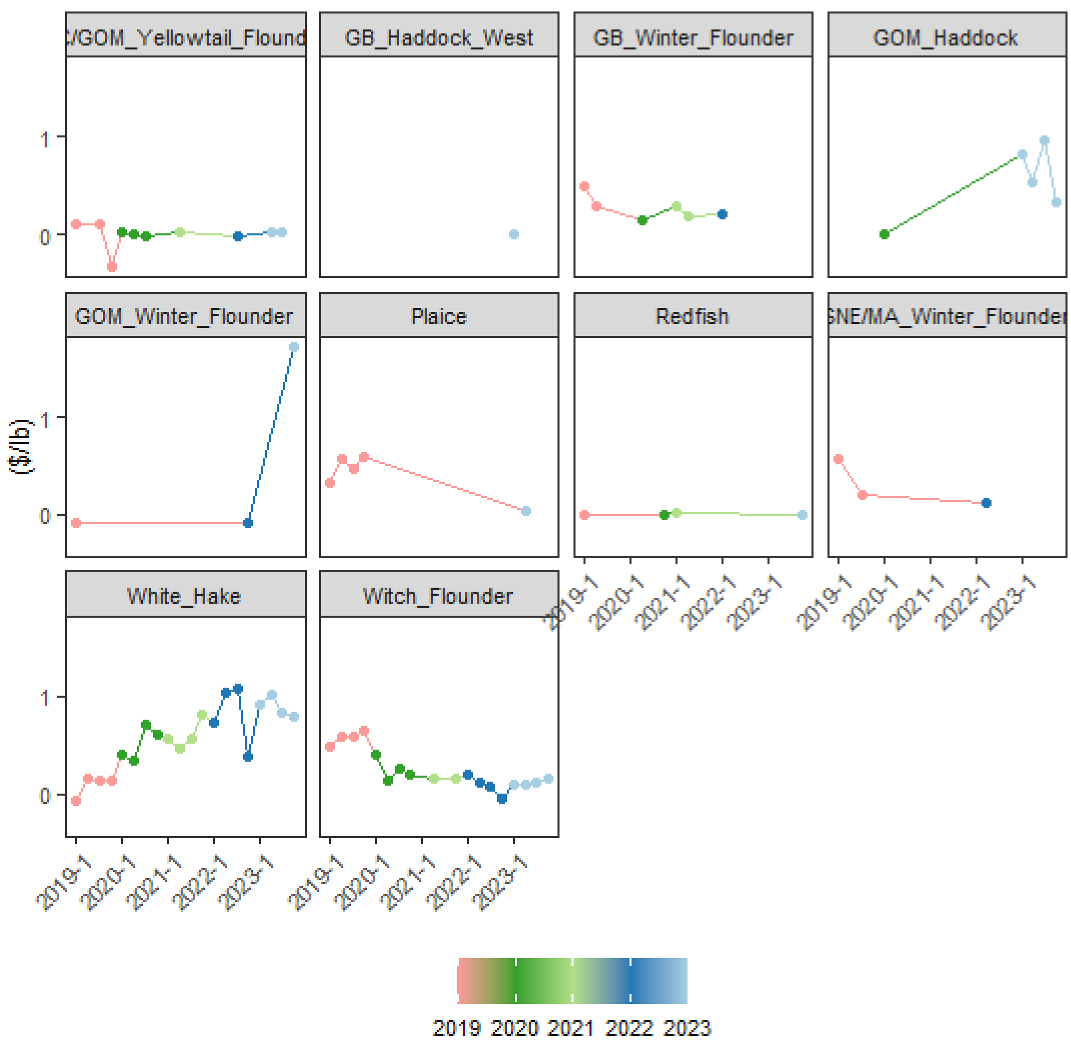
A hedonic price model[25] of reported inter-sector ACE leases between FY2019 and FY2023 shows quarterly price trends in ACE leasing over time (Figure 8). Missing points indicate quarters where there were no reported trades for that stock. A few stocks (e.g. GB haddock east, pollock) do not have reported

[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 22 – Table 25 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 8 – 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 22 – 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 23 – 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 24 – 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 25 – 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 26 – Table 30 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 26). 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 27). 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 28). 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 29). 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 30). Combined groundfish revenues from Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina were $0.02 million during 2023.

Table 26 – 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 27 – 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 28 – 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 29 – 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 30- 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

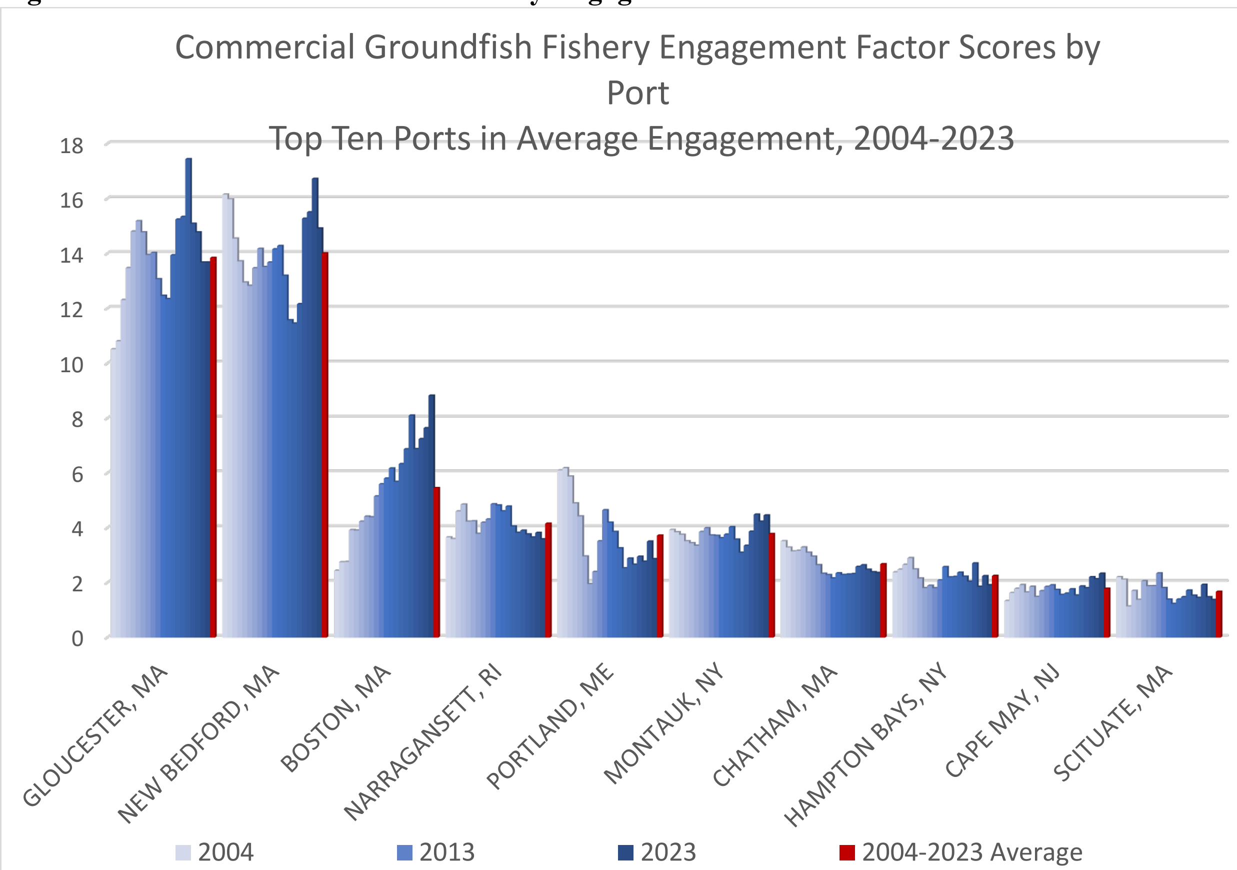
In addition to primary and secondary port classifications for groundfish landings and revenue, fishing communities can also be understood in terms of overall engagement in the commercial groundfish fishery and other social and economic community conditions. NOAA Fisheries social scientists produce indicators 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 9 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 9 – Commercial Groundfish Fishery Engagement Scores



5.7.7.1.2 **2009 – 2020 Recreational Engagement**

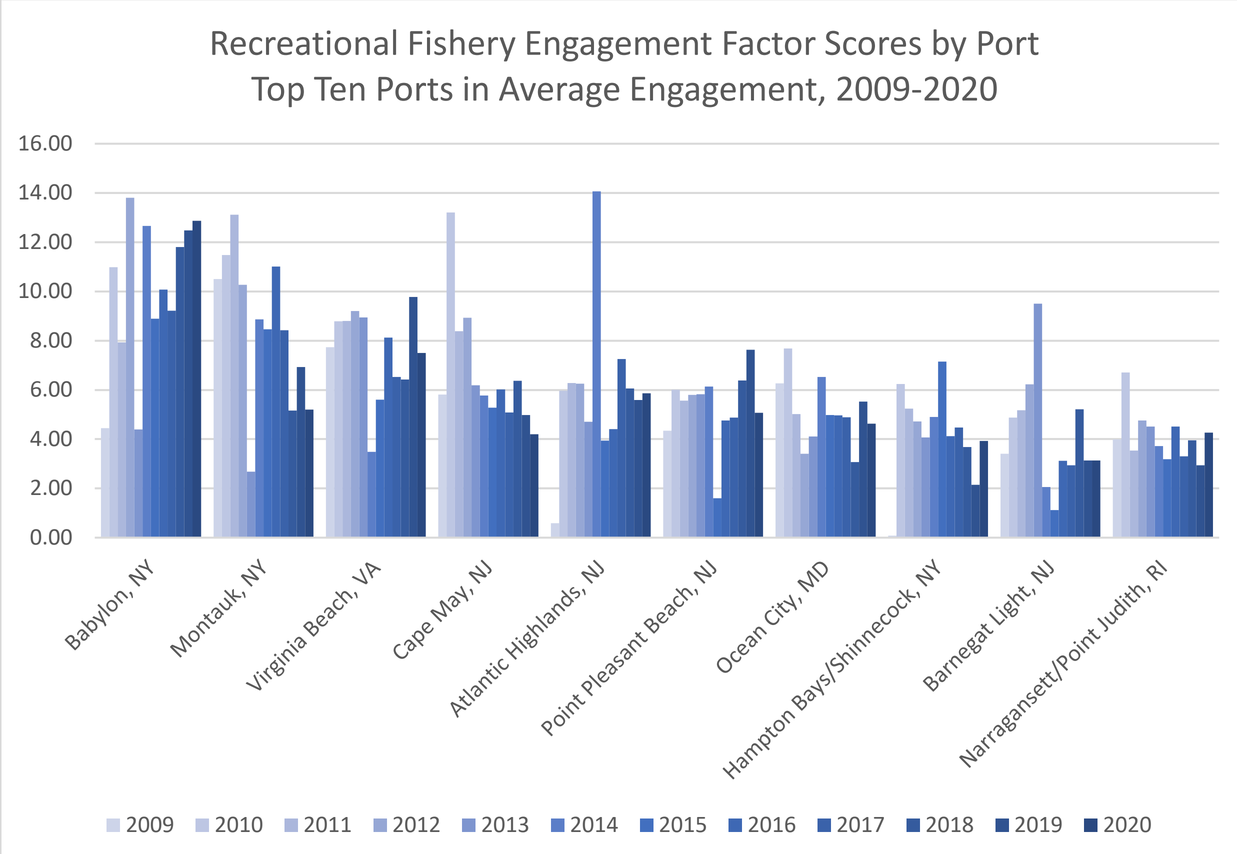
The Recreational Engagement Indicator is a numerical index that reflects the level of a community's engagement in all recreational fisheries relative to other communities in the Northeast. Index factor scores are available from 2009 – 2020 and will be updated through 2021 in the next groundfish specifications 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 10 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 10 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 10). 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 10 – 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 31 and Table 32). 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 31 – 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 32 – 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 33). 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 33). 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 33 – 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 34 – Table 36.

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 34). 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 34 – 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 35- 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 36 – 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).

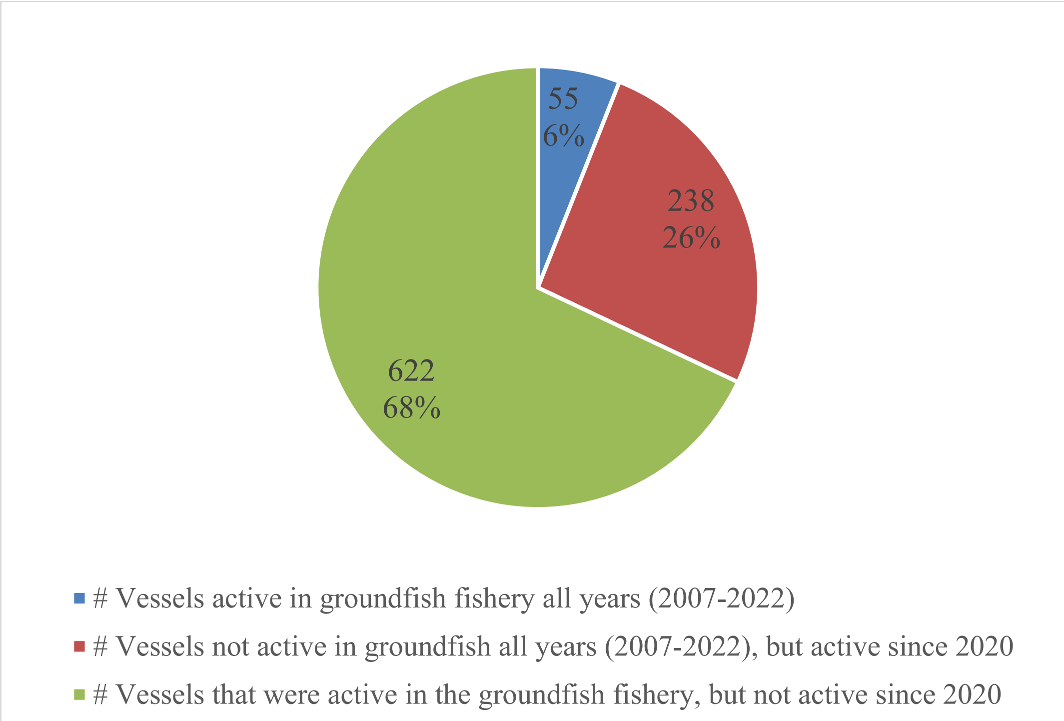
Table 37 shows the change in participation in the groundfish fishery over time. All years in the time series show a decline in the number of active vessels, relative to the previous year. Entry is defined as a vessel being active in a given year, after being inactive in the previous year. Similarly, exit is defined as a vessel being inactive in a given year, after being active in the previous year. Figure 11 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 38 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 37 – 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 11 – 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 38 – 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 39 – Table 41 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 39 – 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 40 – 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 41 – 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 41 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 12 – Figure 35 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 12 – Commercial groundfish fishery in-season catch (mt) of Eastern Gulf of Maine cod.

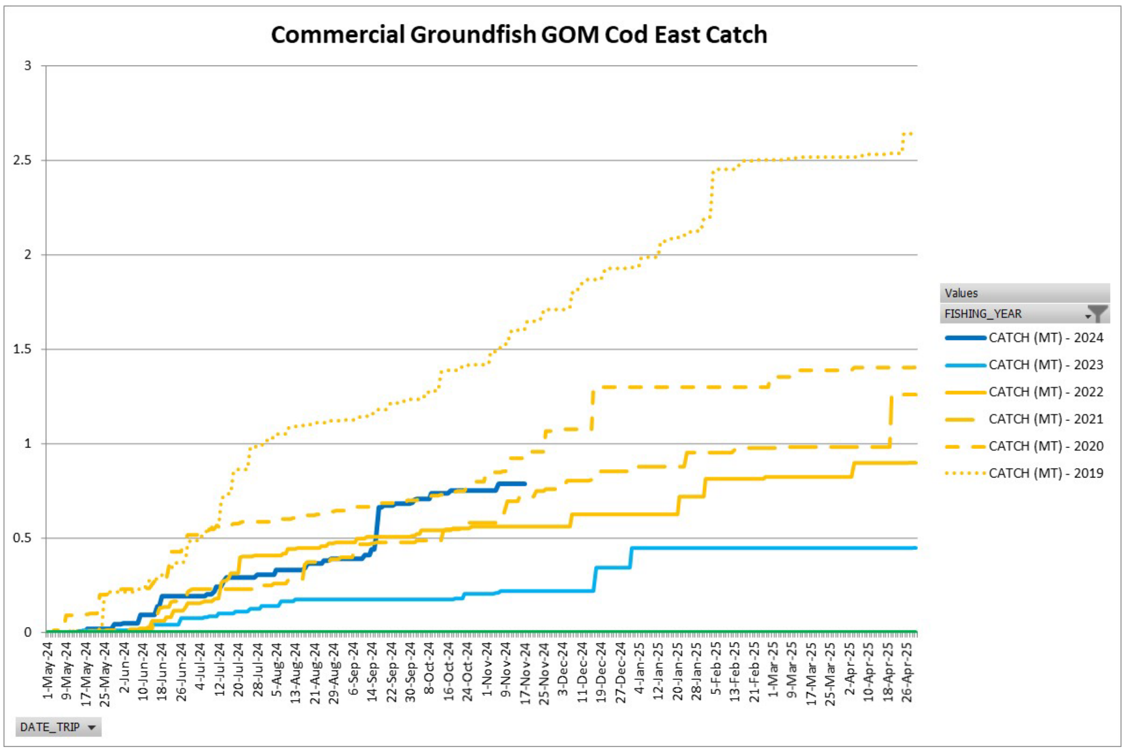


Figure 13 – Commercial groundfish fishery in-season catch (mt) of Western Gulf of Maine cod.

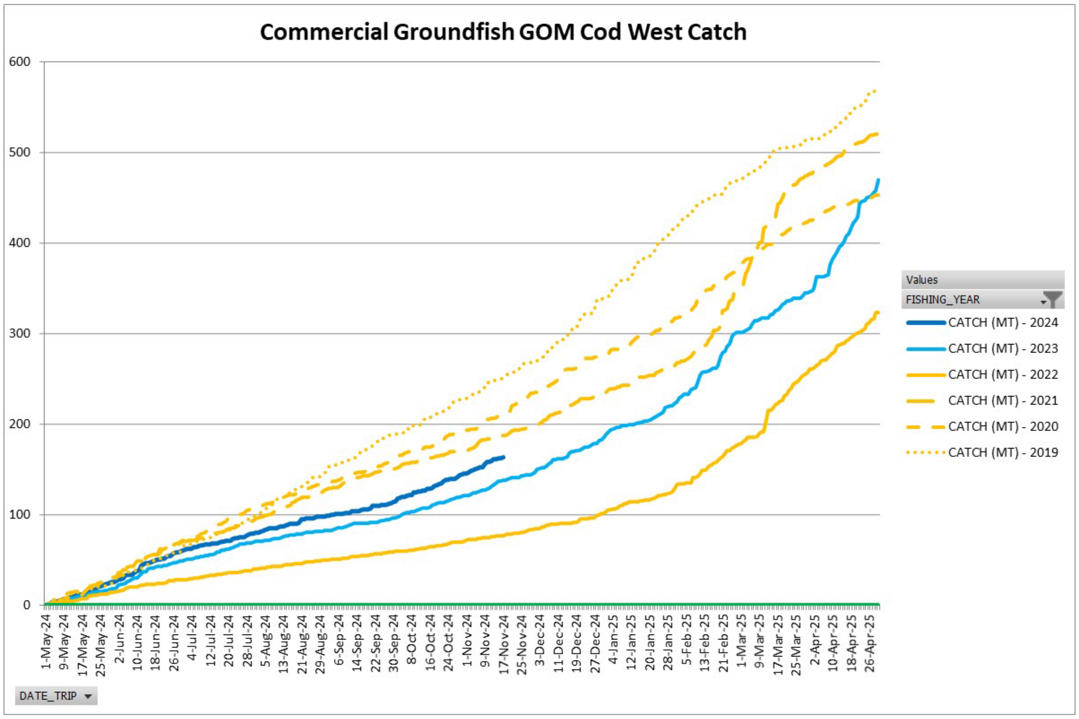


Figure 14 – Commercial groundfish fishery in-season utilization (mt) of Eastern GB cod.

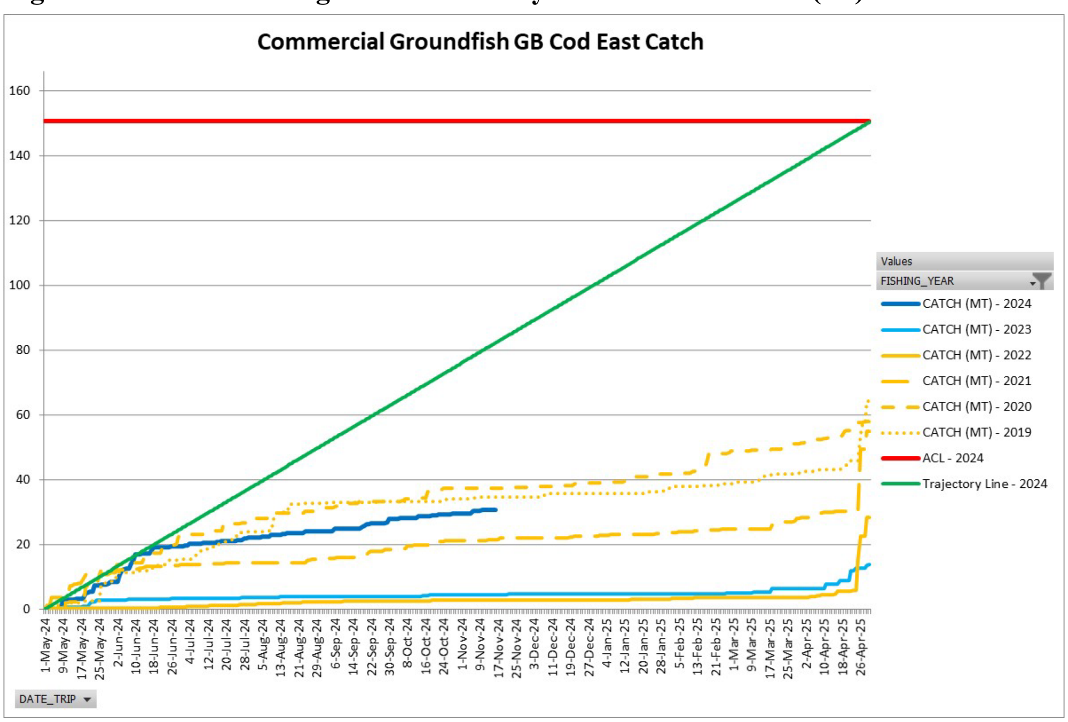


Figure 15 – Commercial groundfish fishery in-season catch (mt) of Georges Bank cod.

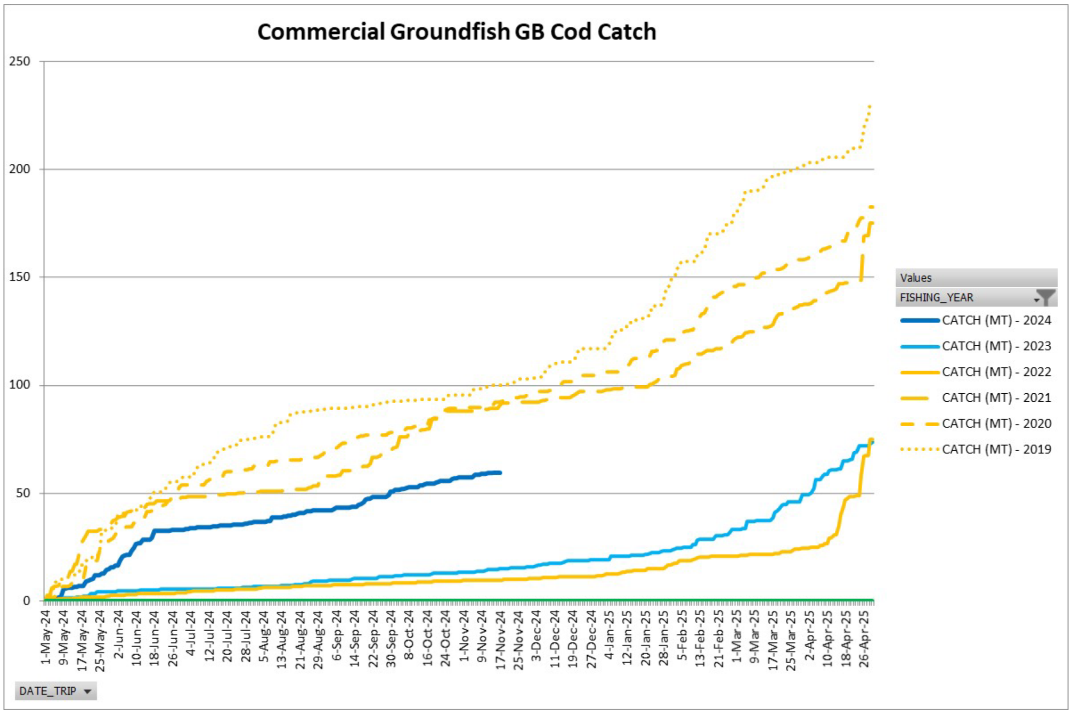


Figure 16 – Commercial groundfish fishery in-season catch (mt) of Southern New England cod.

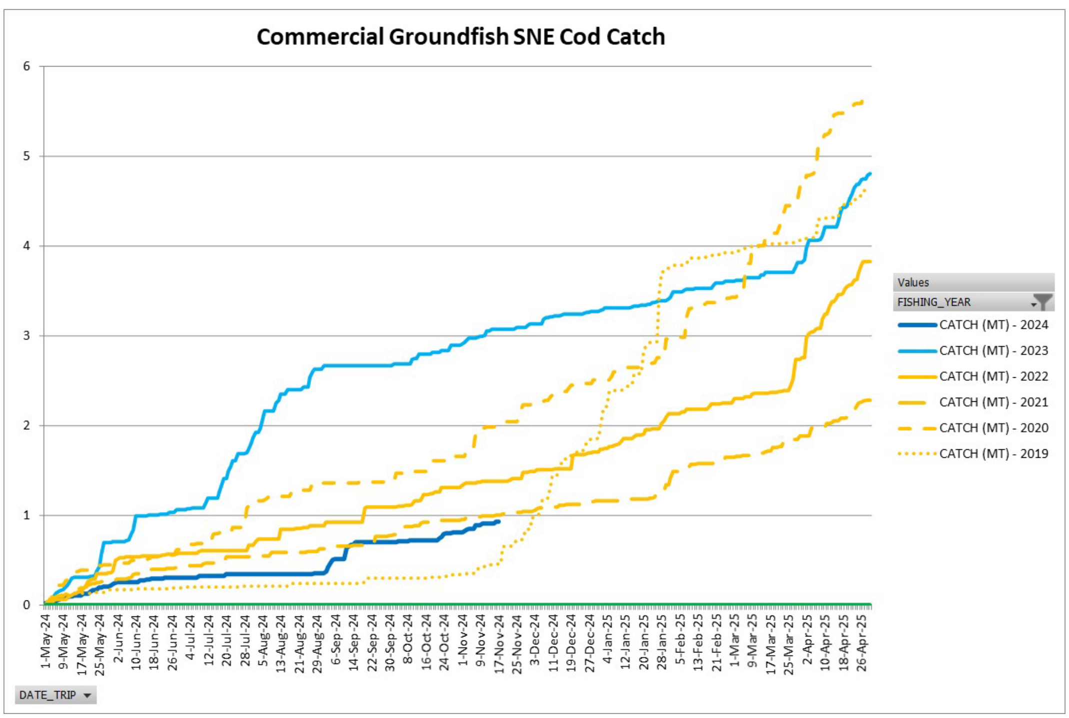


Figure 17 – Commercial groundfish fishery in-season catch (mt) of Eastern GB haddock.

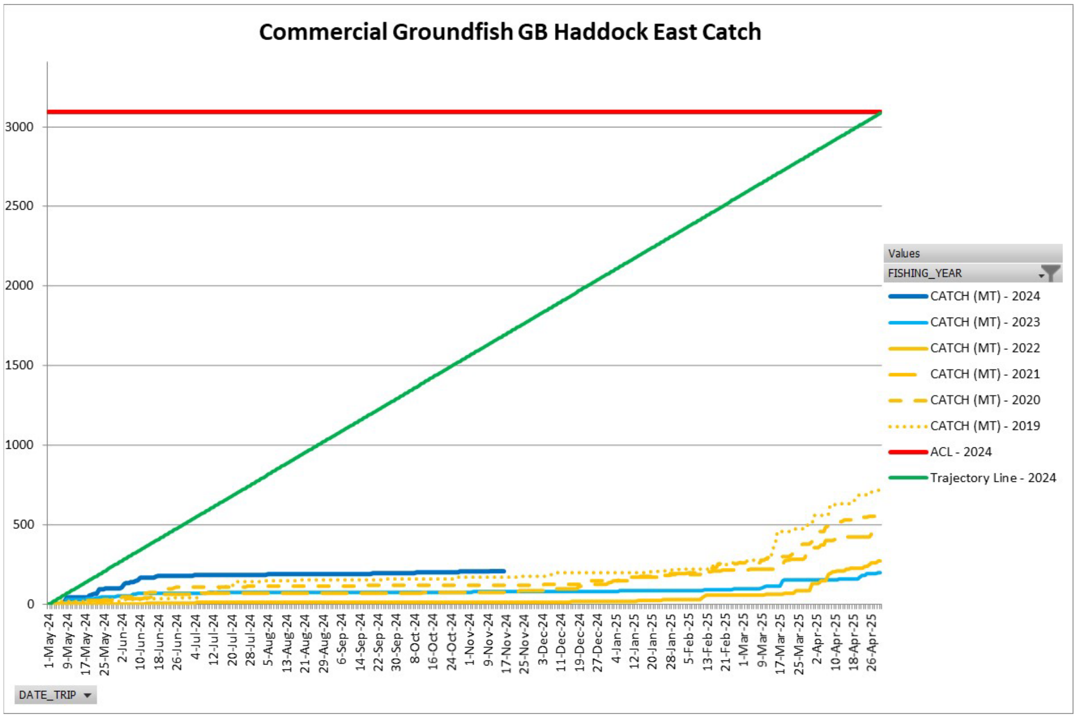


Figure 18 – Commercial groundfish fishery in-season catch (mt) of GB haddock.

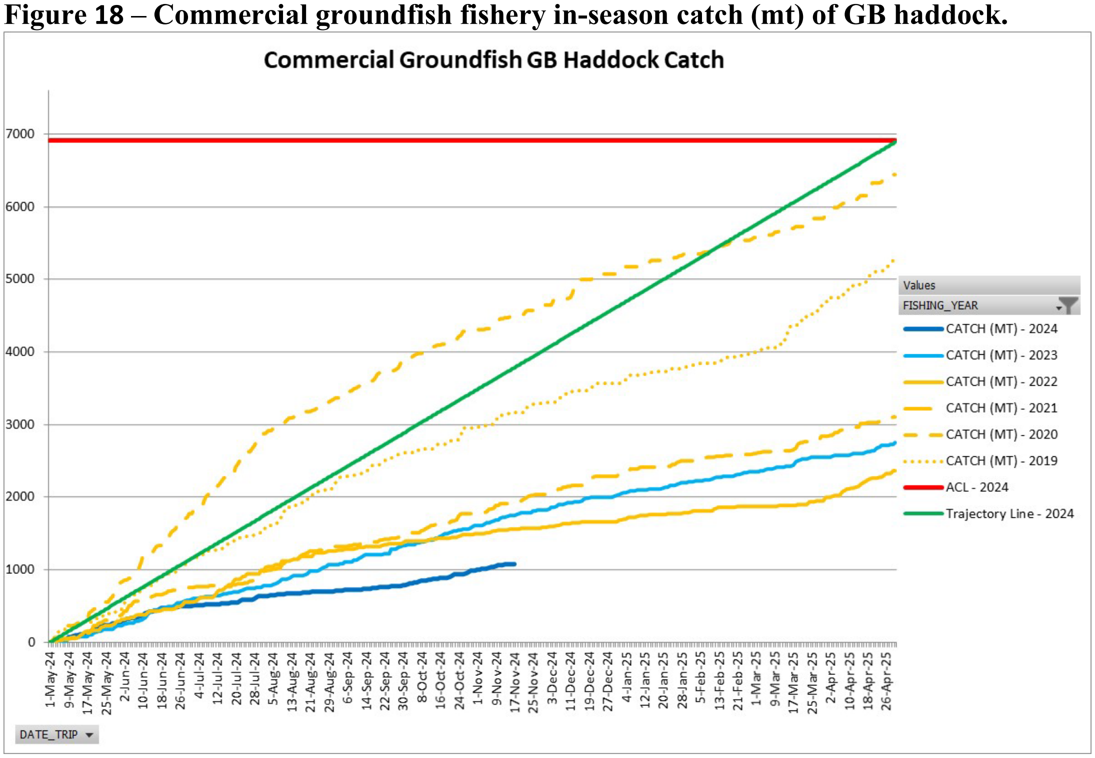


Figure 19 – Commercial groundfish fishery in-season catch (mt) of GOM haddock.

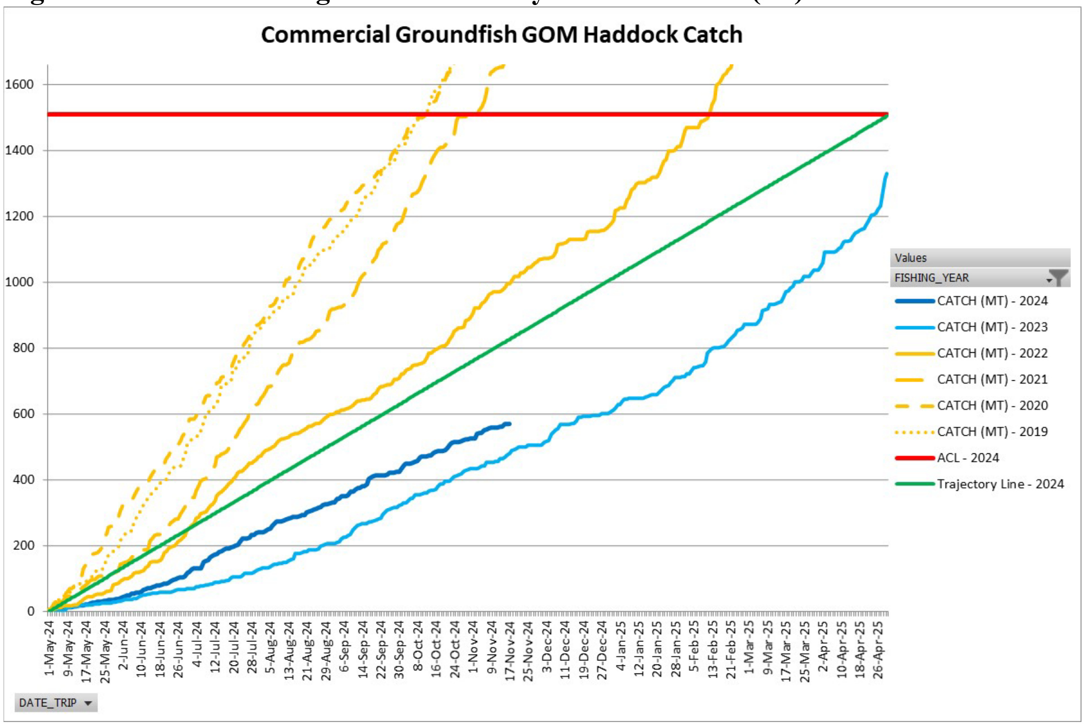


Figure 20 – Commercial groundfish fishery in-season catch (mt) of GB yellowtail flounder.

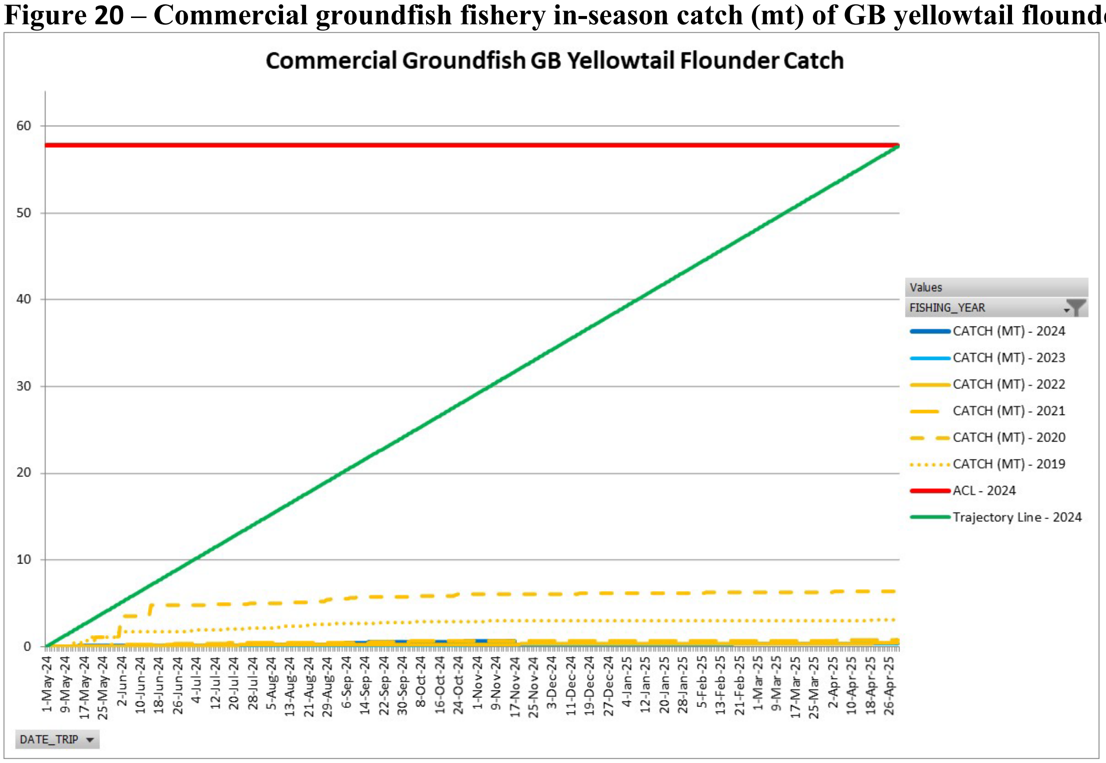


Figure 21 – Commercial groundfish fishery in-season catch (mt) of SNE/MA yellowtail flounder.

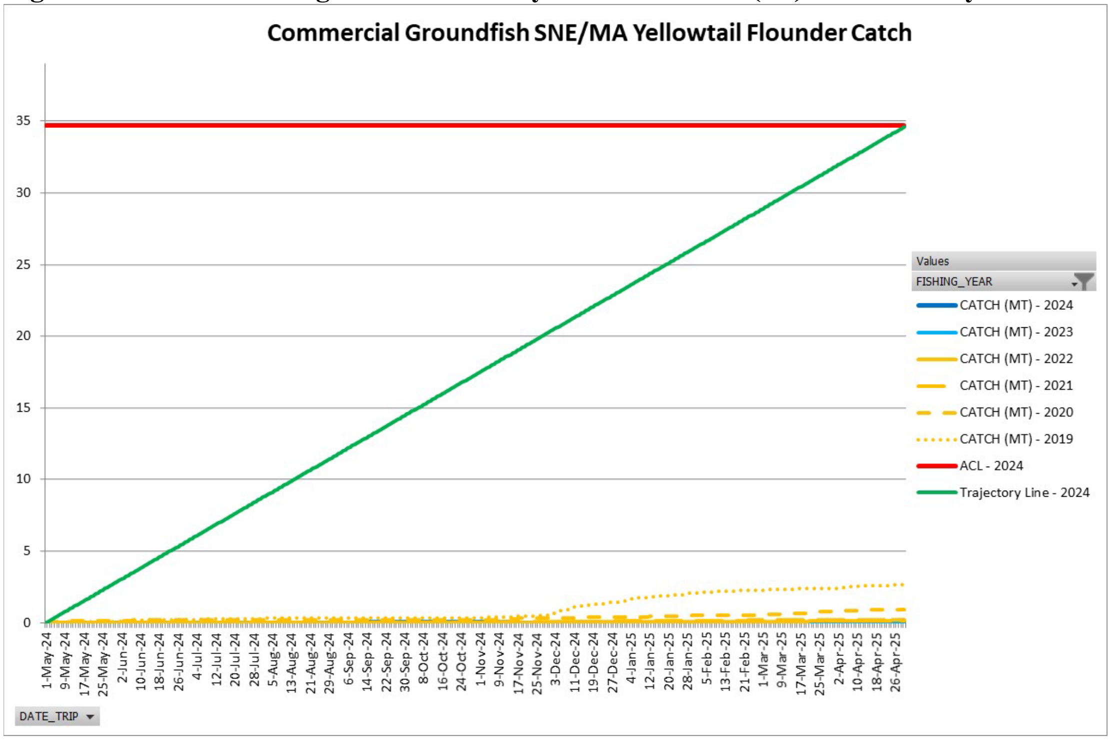


Figure 22 – Commercial groundfish fishery in-season catch (mt) of CC/GOM yellowtail flounder.

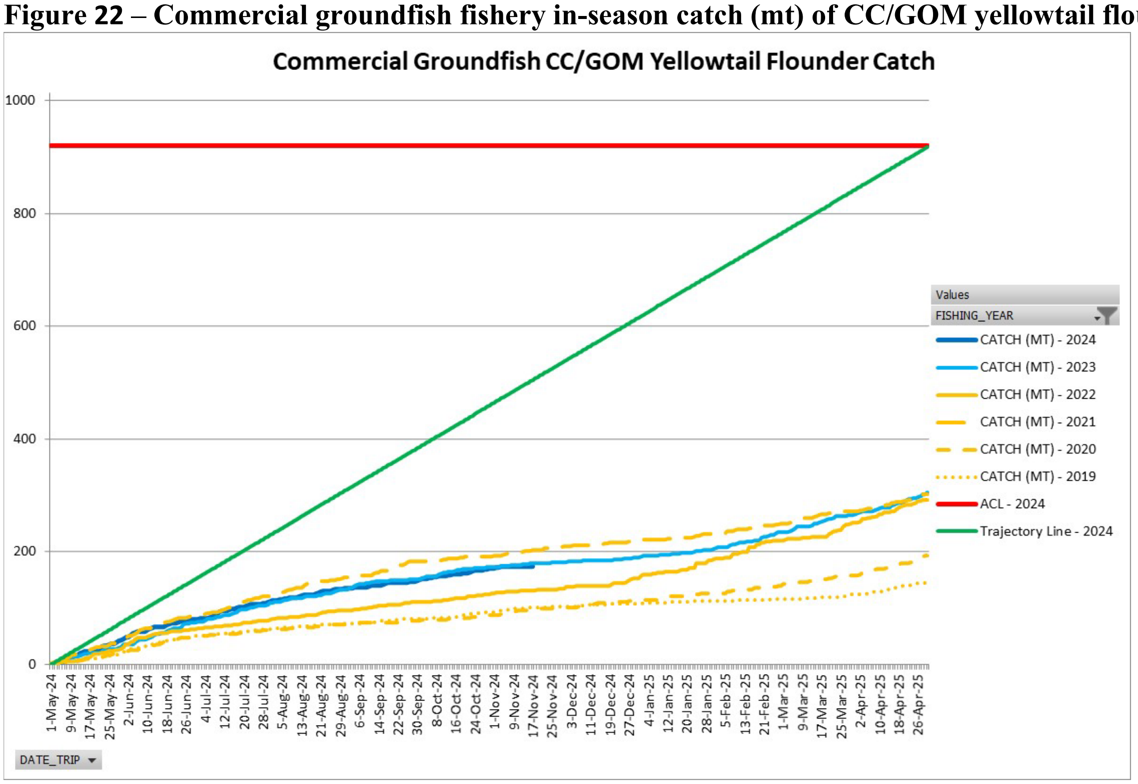


Figure 23 – Commercial groundfish fishery in-season catch (mt) American plaice.

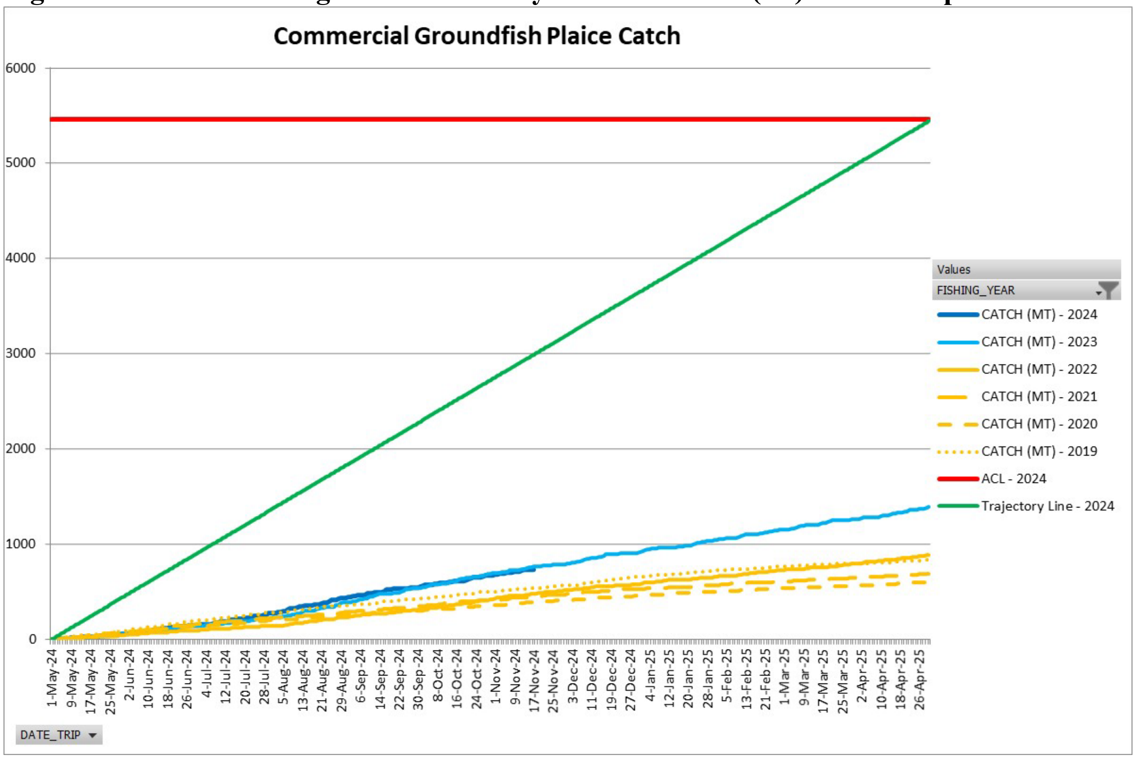


Figure 24 – Commercial groundfish fishery in-season catch (mt) of witch flounder.

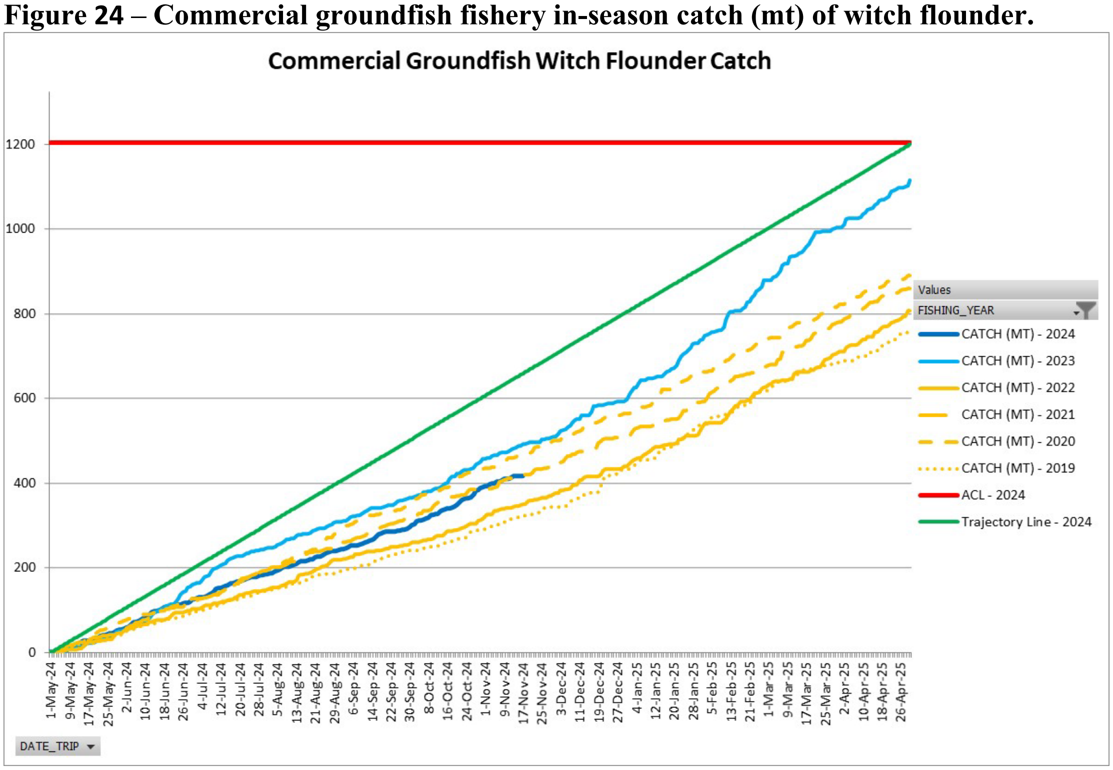


Figure 25 – Commercial groundfish fishery in-season catch (mt) of GB winter flounder.

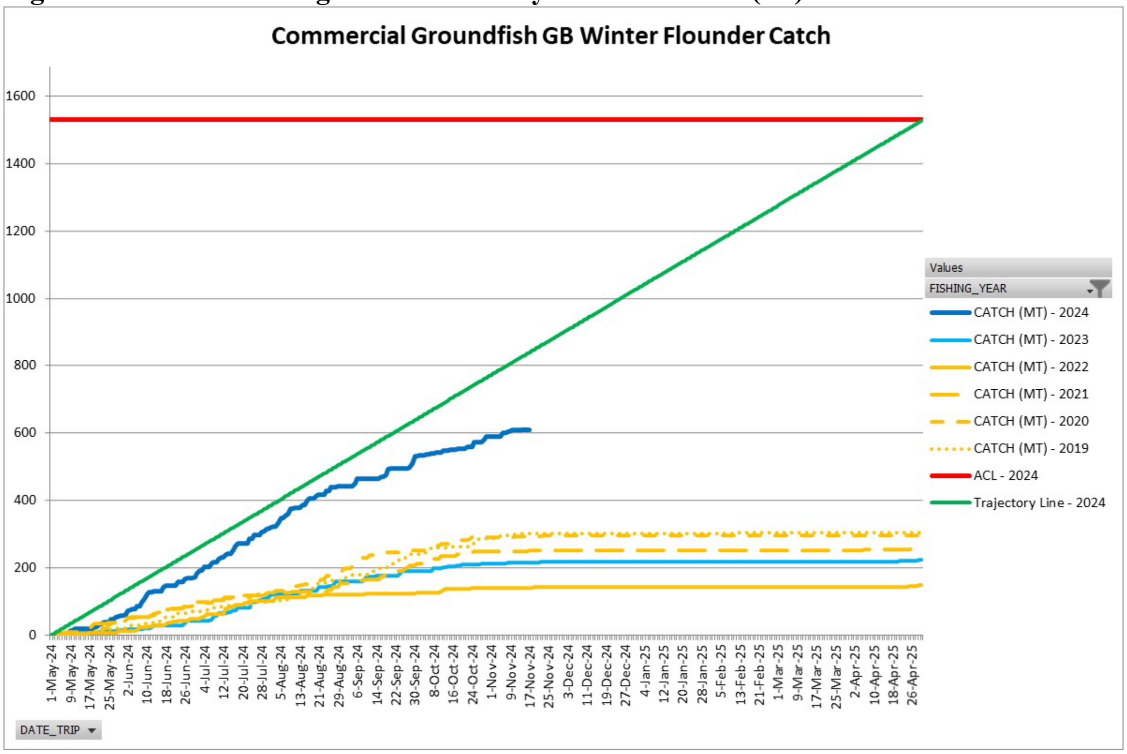


Figure 26 – Commercial groundfish fishery in-season catch (mt) of GOM winter flounder.

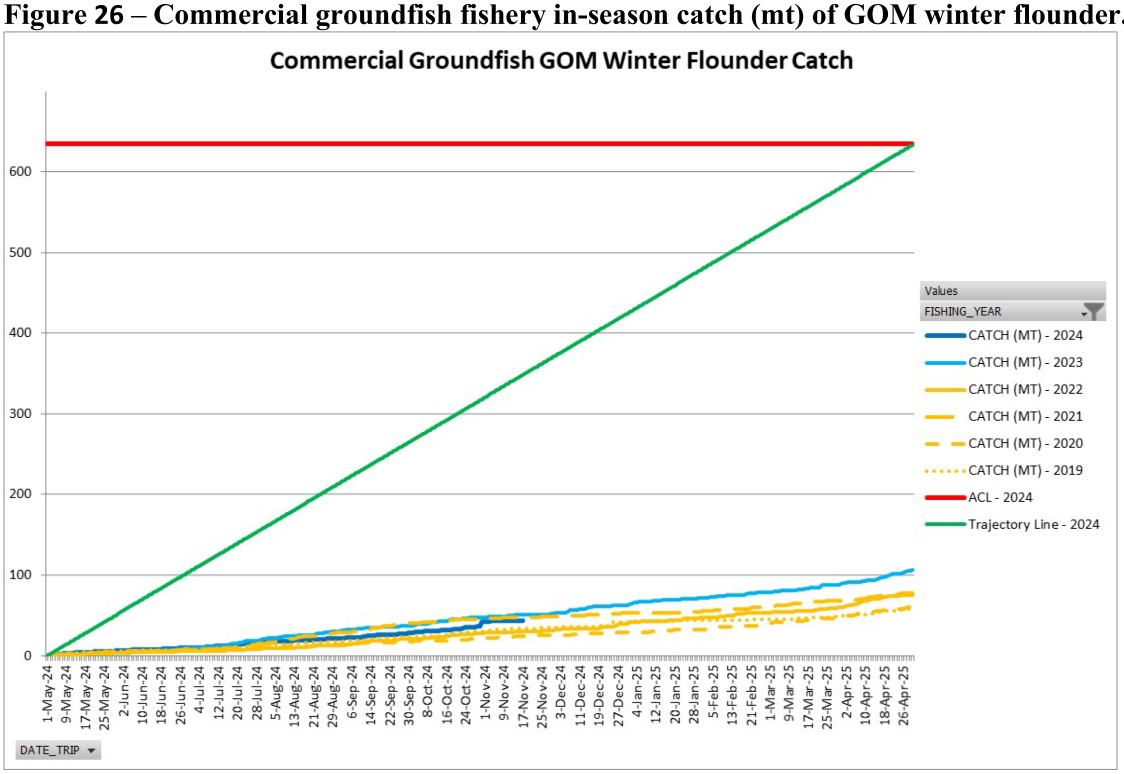


Figure 27 – Commercial groundfish fishery in-season catch (mt) of SNE/MA winter flounder.

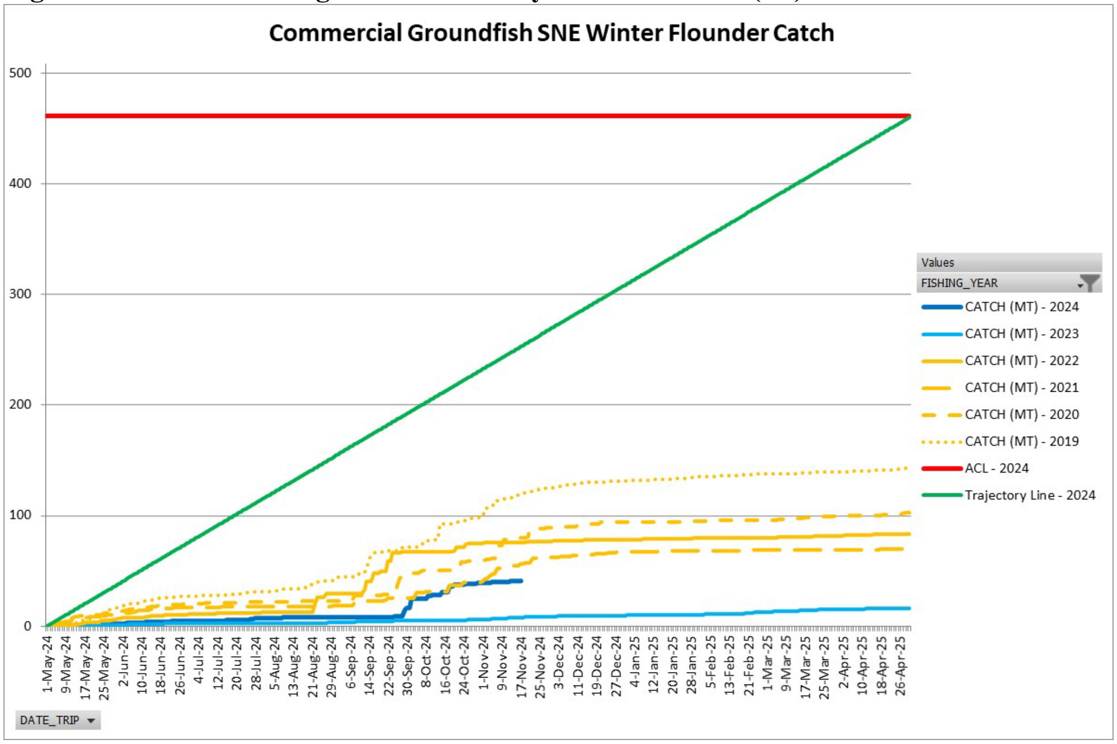


Figure 28 – Commercial groundfish fishery in-season catch (mt) of redfish.

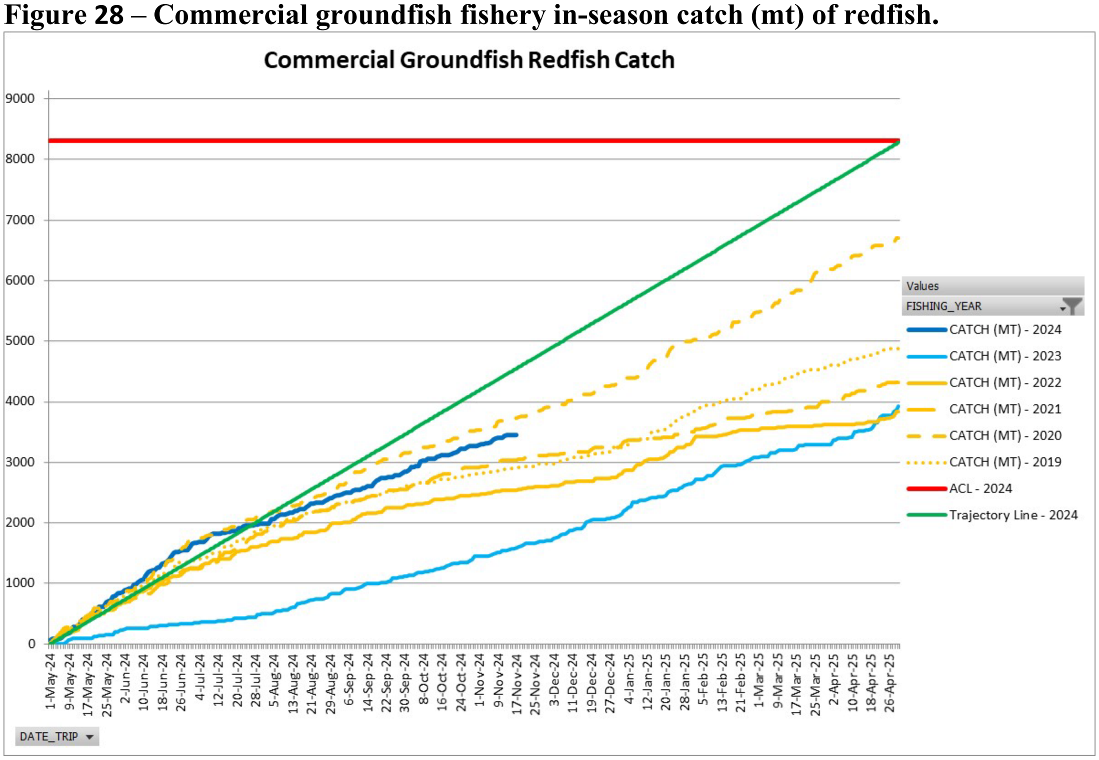


Figure 29 – Commercial groundfish fishery in-season catch (mt) of white hake.

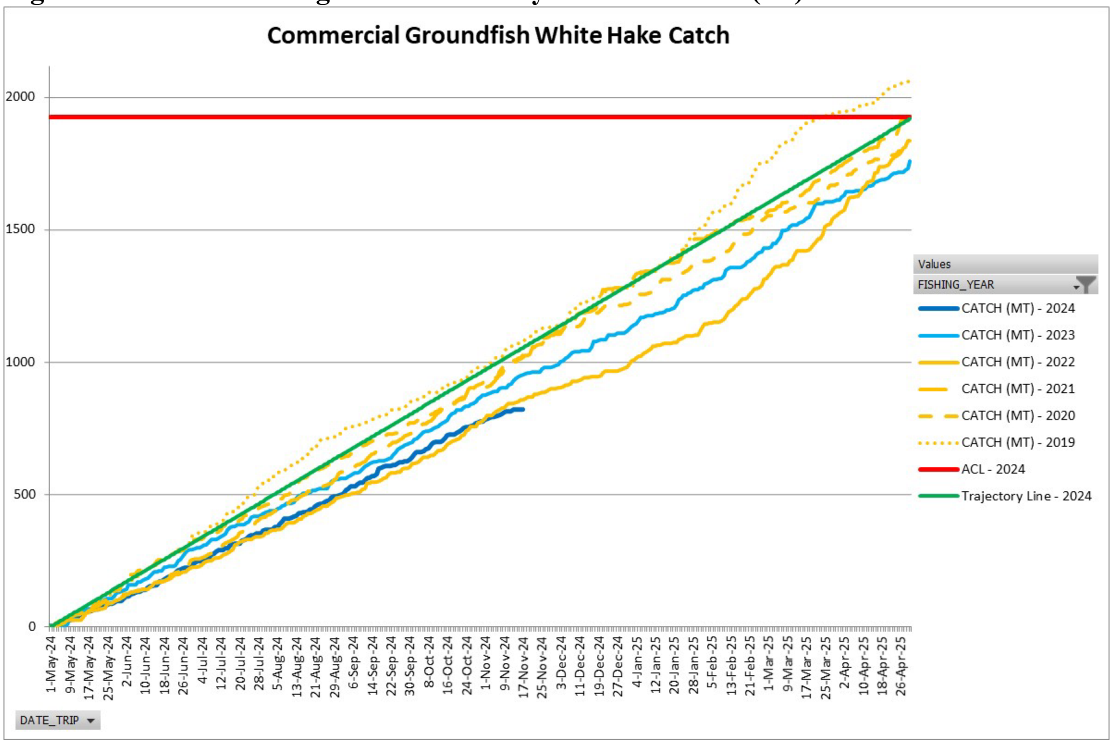


Figure 30 – Commercial groundfish fishery in-season catch (mt) of pollock.

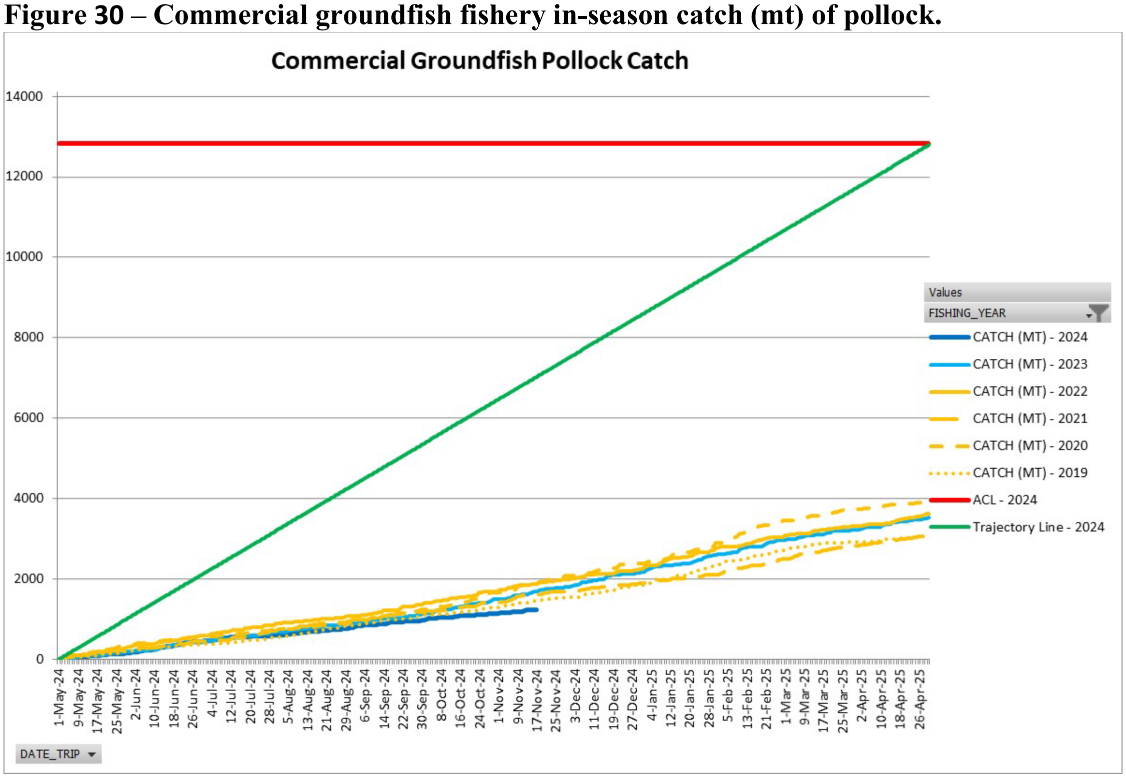


Figure 31 – Commercial groundfish fishery in-season catch (mt) of Atlantic halibut.

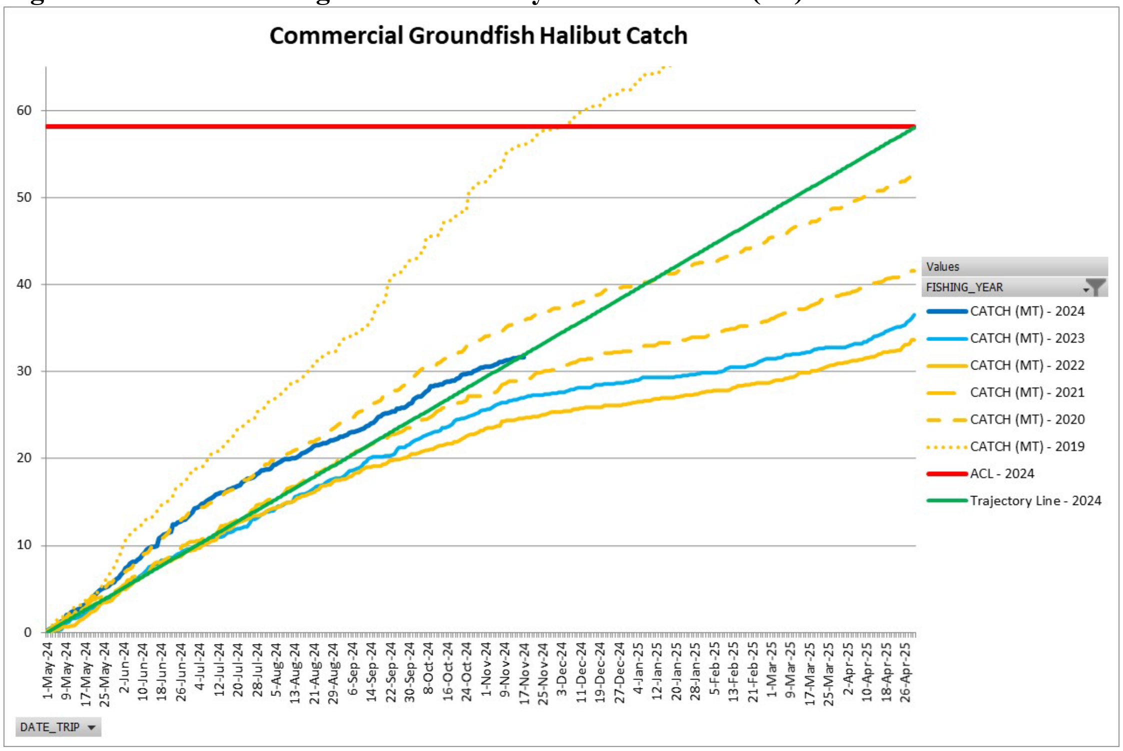


Figure 32 – Commercial groundfish fishery in-season catch (mt) of northern windowpane flounder.

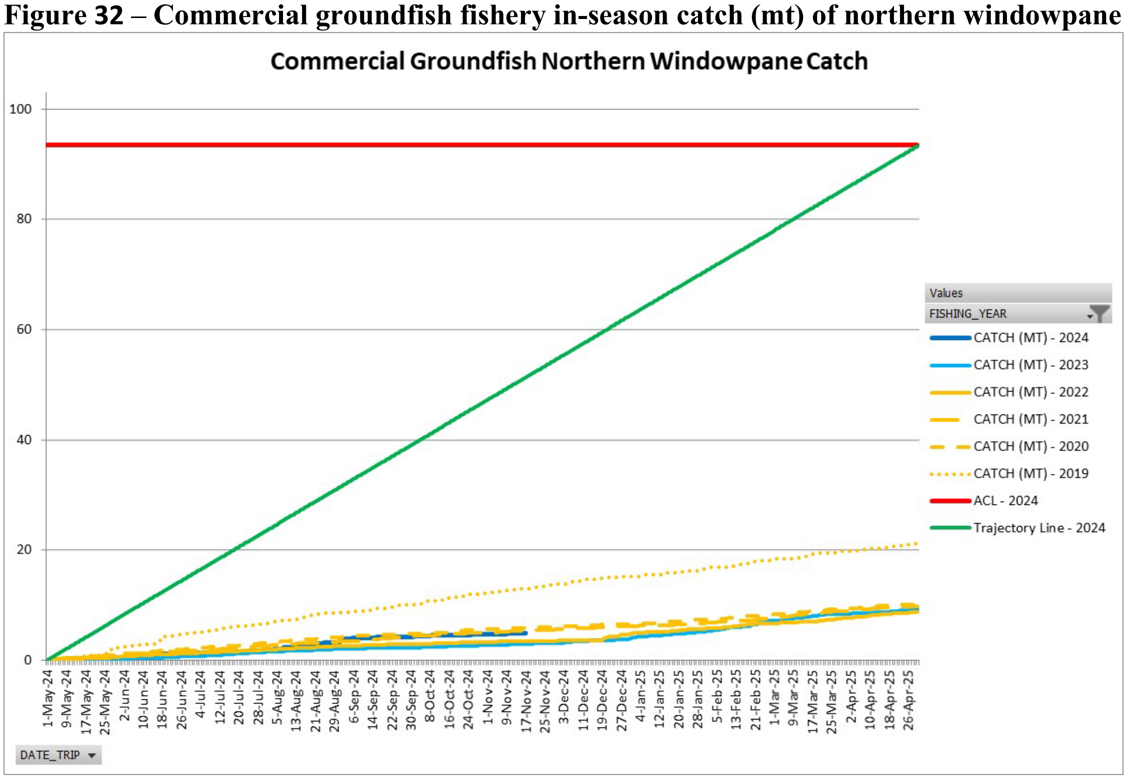


Figure 33 – Commercial groundfish fishery in-season catch (mt) of southern windowpane flounder.

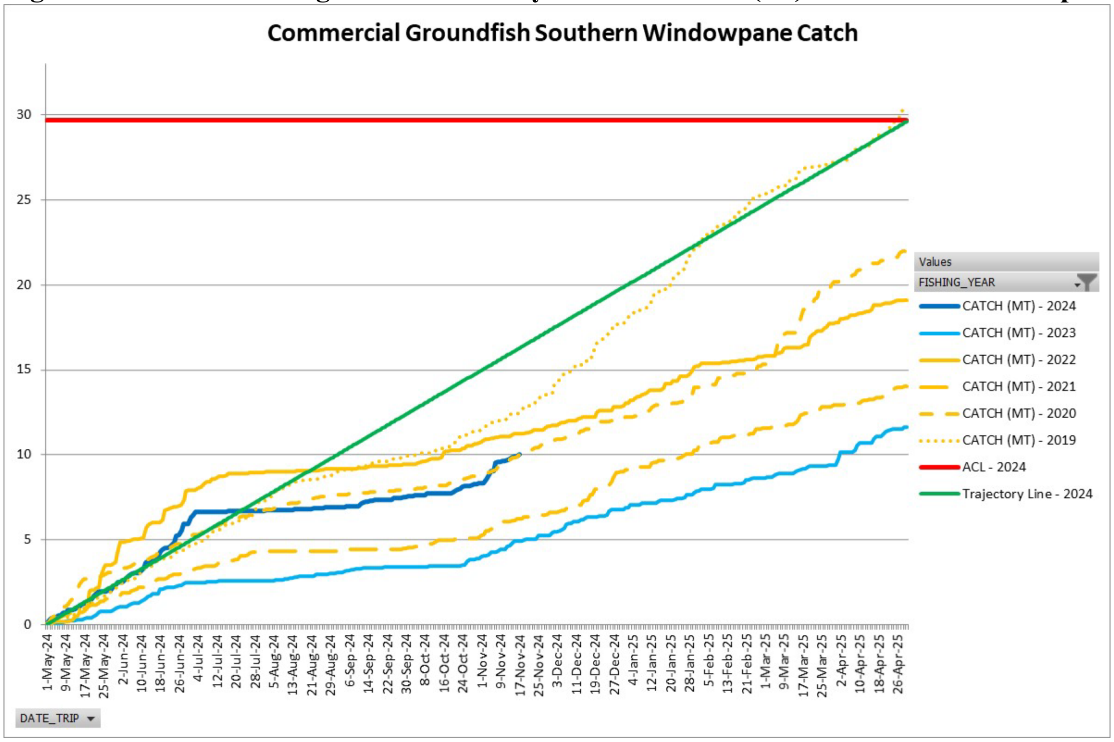


Figure 34 – Commercial groundfish fishery catch (mt) utilization of ocean pout.

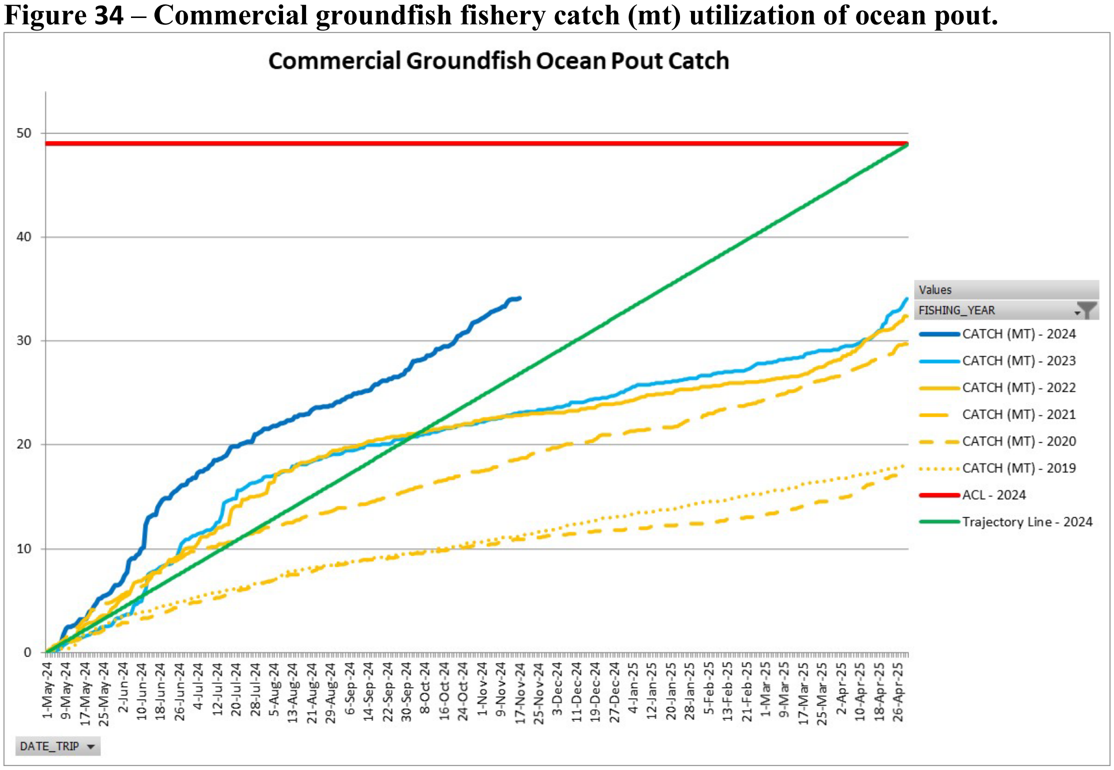
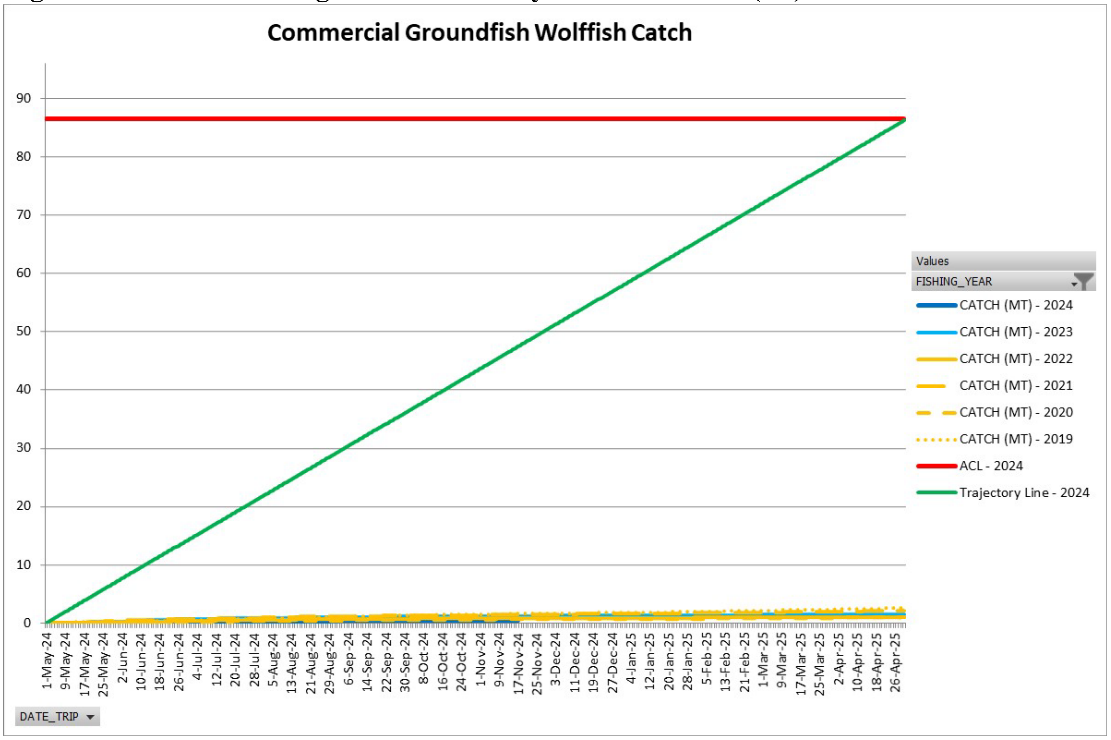


Figure 35 – Commercial groundfish fishery in-season catch (mt) of wolffish.



5.7.10.1.1 Sector Harvesting Component

In all years, the sector vessels landed the overwhelming majority of groundfish landed (Table 16). 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 42). 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 42 – 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 42 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 16).

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 16).

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 43).

Table 43 – 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 43 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 44 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 45 provides information on active party/charter permits by state and year. Table 46 provides information on the number of party/charter trips by state and year.

Table 44 – 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 45 – 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 46 – 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 47 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 48 and Table 49).

Table 47 – 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 48 – 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	623.3	128.3	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
				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 49 – 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 50 provides a breakdown of the number of vessels active in the for-hire component of the recreational fishery for FY2019 to FY2023.

Table 50 – 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 51.

Table 51 – 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 52 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 53 summarizes recent catches by the commercial fishery of SNE cod.

Table 52 – 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 53- 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.