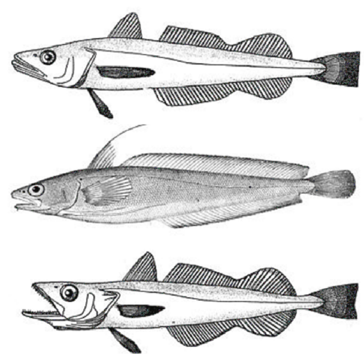
Northeast Multispecies Fishery Management Plan

Small-Mesh Fishery Specifications for Fishing Years 2024-2026

Including an Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Analysis



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

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FISHING YEARS 2024-2026 SMALL-MESH FISHERY SPECIFICATIONS FOR THE NORTHEAST MULTISPECIES FISHERY MANAGEMENT PLAN

Proposed Action: Proposed small-mesh multispecies fishery specifications for fishing years 2024 - 2026.

Responsible Agencies:

New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01950

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Washington, D.C. 20235

For Further Information:

Dr. Cate O'Keefe, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, Massachusetts 01950
Phone: (978) 465-0492
Fax: (978) 465-3116

Abstract: The New England Fishery Management Council, in consultation with NOAA's National Marine Fisheries Service, has prepared a Specifications Document for the Northeast Multispecies Fishery Management Plan (Small-Mesh), which includes an Environmental Assessment. The proposed action focuses on adjustments to annual specifications. The document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives on both. It addresses the requirements of the Magnuson Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, the Regulatory Flexibility Act, and other applicable laws.

1.0 EXECUTIVE SUMMARY

Purpose and Need

The purpose of this Specifications Document for Fishing Years 2024 to 2026 is to set or adjust catch limits for four small-mesh multispecies stocks. This document and the recommended specifications incorporate the results the September 2023 stock assessments that analyzed stock trends through 2022. The need for this action is to prevent overfishing and help achieve optimum yield in the small-mesh multispecies fishery, consistent with the status of stocks and the requirements of the Magnuson-Stevens Fishery Conservation and Management Act, and the Northeast Multispecies Fishery Management Plan (FMP).

This document also contains information and supporting analyses required under other applicable law, including the National Environmental Policy Act (NEPA) and Regulatory Flexibility Act (RFA). This EA updates the previously approved Amendment 19 to the Northeast Multispecies FMP Environmental Impact Statement (NEFMC 2012) which established the catch management framework and overfishing definitions for the four stocks in the fishery.

Proposed Action

The proposed action is comprised of the preferred alternative summarized here and detailed in Section 4.0. The preferred alternative (Alternative 2; Section 4.2) with Option 2 (Section 4.2.2) for the northern red hake TAL, would adopt new Acceptable Biological Catches (ABC), Annual Catch Limits (ACL), and Total Allowable Landings (TAL) for four small-mesh multispecies stocks: northern silver hake, southern whiting (southern silver and offshore hakes), northern red hake, and southern red hake (Table 7 and Table 8). The ABC for northern silver hake would increase to 40,868 mt, the ACL would increase to 38,825 mt, and the TAL would increase to 31,347 mt. Southern whiting specifications would decrease, with an ABC of 20,149 mt, an ACL of 19,142 mt, and TAL of 13,881 mt. Northern red hake specifications would also decrease slightly, with an ABC of 3,129 mt, an ACL of 2,973 mt, and a TAL of 1,274 mt. The northern red hake TAL accounts for uncertainty in the FY 2020-2022 discard rate estimate by using the FY 2017-2019 discard estimate to determine the TAL. Finally, southern red hake ABC and ACL would increase to 1,826 mt and 1,735 mt, respectively, with a TAL of 314 mt, which is a decrease from FY 2021-2023 specifications to account for the higher observed discard rate in 2020-2022.

Summary of Impacts of the Proposed Action

The direct and indirect impacts on the five Valuable Environmental Components (VECs) (described in Section 5.0) are assessed in Section 6.0 and summarized in Table 1. A summary of these potential impacts is given below.

Impacts on Target Species

The preferred alternative is expected to have slight positive impacts on the target species (northern silver hake, southern whiting, northern red hake, and southern red hake). The proposed changes in specifications are based on the most recently updated data available and account for changes in stock biomass as well as scientific uncertainty, discards, and state water landings. The updated specifications for the proposed action are expected to have very low risk of overfishing. The proposed specifications are not anticipated to be limiting and are not expected to increase fishing effort because the fishery is constrained by other factors. A higher northern red hake TAL in the preferred alternative would reduce the risk of triggering a premature in-season accountability measure caused by an otherwise highly uncertain discard rate in Option 1 (Section 4.2.1) based on 2020-2022 data primarily driven by only 15 observed lobster trap trips (4 of which had 62 lb of red hake discards). This northern red hake TAL adjustment would not appreciably increase the risk of causing overfishing because of the relatively large buffer between the TAL and the ACL.

Impacts on Non-target Species

The preferred alternative is expected to have slight negative impacts on overfished non-target species such as Atlantic herring and Northern windowpane flounder, and slight positive impacts on non-target species that are not overfished such as spiny dogfish, butterfish, little skate, barndoor skate, and monkfish. Fishing effort is not expected to change under the new specifications given that the ABC has not been reached for the primary target stocks (primarily northern silver hake and southern whiting) in recent years. Option 2 for the northern red hake TAL is not expected to increase fishing effort but it could lead to changes in location of fishing, which may increase bycatch of species associated with red hake assuming that trips would fish elsewhere to avoid red hake if an in-season AM is triggered.

Impacts on Protected Species

The preferred alternative would likely have a slight negative to slight positive impact on protected species. The action is anticipated to have a negligible to slightly negative impact on ESA-listed species, and a slight negative to slight positive impact on non-ESA-listed/MMPA protected species. Substantial increases in fishing effort are not expected under the preferred alternative, given that ABCs for the target species have not been constraining in recent years, though the changes in specifications could possibly lead to spatial shifts in fishing effort to avoid or target particular hake stocks. This could potentially lead to corresponding increased or decreased risks for co-occurring protected species.

Impacts on the Physical Environment & Essential Fish Habitat (EFH)

The preferred alternative is expected to have a slight negative impact on the physical environment and essential fish habitat, because small-mesh multispecies trawls have a slightly negative impact on the physical environment. The preferred alternative is not anticipated to substantially change fishing effort, though Option 2 for the northern red hake TAL would provide an opportunity for vessel to continue fishing for small-mesh species without changing fishing behavior to avoid red hake. If an in-season AM is prematurely triggered, vessels could shift effort away from mud and mud-sand areas to fish in other areas which are typically more sensitive to disturbance. The preferred alternative could prevent this.

Impacts on Human Communities

The preferred alternative is anticipated to have slight positive economic and social impacts on human communities. The TAL for northern silver hake would increase by 80% under the preferred alternative, which offers an opportunity for a positive economic impact, though utilization rates are not expected to substantially increase. In the northern management area, small-mesh multispecies vessels could make shorter trips to catch the possession limit, reducing associated fishing costs.

The preferred alternative for the northern red hake TAL, Option 2, would provide more flexibility than Option 1, allowing the fishery to operate with a lower risk of triggering in-season AMs. Assuming that the fishery lands the TALs, the combined economic impact of the preferred alternative for all four stocks is more positive than the No Action alternative or Alternative 2, Option 1. The social impacts of the preferred alternatives would also likely be slightly positive. The northern silver hake ABC would increase, which could offer additional fishing opportunities and possibly lead to positive attitudes from stakeholders towards management. Though the ABCs would decrease for two stocks, the specifications are not expected to be constraining to the fishery and would likely maintain the current employment opportunities available in the fishery and adjacent sectors. Higher specifications elsewhere for northern silver hake and southern red hake could provide additional opportunities if market demand increases. The opportunity could allow new fishermen to begin targeting these stocks or mitigate declines in other fisheries that otherwise target other stocks, such as haddock, squid, herring, and mackerel. Some of these stocks either have declining abundance or increasing restrictions on fishing. The added opportunity created by the updated specifications could thus create positive social and economic impacts without jeopardizing the small-mesh multispecies fishery.

Alternatives to the Proposed Action

Additional alternatives were also considered, as detailed in Section 4.0. The No Action alternative (Alternative 1; Section 4.1) would maintain the FY 2021-2023 specifications (Table 6). The ABC for northern silver hake would be 20,410 mt, the ACL would be 19,387 mt, and the TAL would remain 17,457 mt. Southern whiting specifications would be set at an ABC of 40,990 mt, an ACL of 38,941 mt, and TAL of 25,868 mt. Northern red hake specifications would stay at 3,452 mt for the ABC, 3,278 mt for the ACL, and 1,405 mt for the TAL. Finally, southern red hake ABC and ACL would be 1,505 mt and 1,439 mt, respectively, with a TAL of 422 mt. Under Alternative 2, there is also another option for the northern red hake TAL (Option 1) that would use a highly uncertain northern red hake discard rate from FY 2020-2022, resulting in a TAL of 213 mt and a TAL trigger of 192 mt.

Impacts of Alternatives to the Proposed Action

Impacts on Target Species

The No Action alternative (Alternative 1) would likely have a positive impact on northern silver hake, a moderate negative impact on southern whiting, a slight positive impact on northern red hake, and a positive impact on southern red hake. A moderately negative impact of No Action on southern whiting is expected because the ACL would be almost double what is appropriate due to recent changes in stock biomass, which is between the overfished threshold and the MSY-proxy biomass target. If catch increases, it could cause a stock biomass decline and increase the risk of the southern whiting stock to become overfished.

Under No Action, the ACLs for northern silver hake and southern red hake are less than those recommended by the SSC to prevent overfishing and minimize the risk that the stocks would become overfished, so the alternative would likely have positive biological impacts on the stock. Northern silver hake biomass would remain high or even increase more and southern red hake biomass could increase and rebuild toward the management target.

The catch limits for southern whiting under No Action would be higher than the recommended values, which would likely have negligible impacts in the short term given that specifications are not expected to be constraining, but there could be a moderately negative impact on southern whiting if fishing effort increases and causes biomass to decline below the management threshold and become overfished. The No Action alternative would also set the ABC for northern red hake slightly higher than the recommended values, though the stock biomass is well above the target, and therefore is unlikely to cause the stock to become overfished. Alternative 2, Option 1 would likely have a slight positive impact on all four stocks, as the changes in specifications account for changes in stock biomass as well as scientific uncertainty, discards, and state water landings, resulting in low estimated risks of overfishing.

Impacts on Non-target Species

The No Action alternative and Alternative 2, Option 1 would likely have slight negative impacts on overfished species and slightly positive impacts on species that are not overfished. Fishing effort is not expected to change substantially as a result of these alternatives and would maintain a similar level of impact to non-target species as that seen in recent years. However, Alternative 2 Option 1 may lead to changes in the location of fishing effort to avoid catching large amounts of red hake if the in-season accountability measure is triggered early, which could lower the bycatch of species that are associated with red hake or their habitat of sand/mud bottoms.

Impacts on Protected Resources

The No Action alternative is expected to have negligible to slightly negative impacts on ESA-listed species and negligible to slightly positive impacts on non-ESA-listed/MMPA protected species, while Alternative 2, Option 1 is expected to have negligible to slightly negative impacts on ESA-listed species and slight negative to slight positive impacts on MMPA protected species. The No Action alternative would maintain the previously established specifications, likely resulting in similar fishing patterns to those currently observed and therefore is not expected to introduce new or elevated interaction risks to non-ESA-listed species. This would result in negligible impacts to non-ESA-listed stocks/species in poor condition, but indirect, slightly positive impacts on species/stocks for which current operating conditions are not expected to result in exceedance of the potential biological removal (PBR) level. Similarly, given the likely continuation of current fishing effort and behavior patterns, the No Action alternative would likely have negligible to slightly negative impacts on ESA-listed species. Alternative 2, Option 1 is expected to have similar impacts to the No Action alternative, though if the TAL is reached, there may be less fishing effort in areas where red hake typically occur, which could have slightly positive impacts on protected species that co-occur with red hake and slightly negative impacts on others.

Impacts on the Physical Environment and Essential Fish Habitat (EFH)
The No Action alternative and Alternative 2, Option 1 would likely have slightly negative impacts on the physical environment and essential fish habitat. The trawl gear used in the small-mesh multispecies fishery does have a slightly negative impact on the physical environment. While the No Action alternative is not anticipated to change fishing effort, Option 1 for the northern red hake TAL would decrease the TAL by 85% and could lead to vessels changing fishing locations to avoid catching red hake if the TAL is approached. This could reduce impacts on mud and mud-sand habitats frequented by northern red hake, increasing impacts on potentially more sensitive habitat elsewhere.

Impacts on Human Communities
The No Action alternative is anticipated to have a negligible to slightly positive economic impact and a negligible to slightly negative social impact on human communities. The specifications in the No Action alternative have not been constraining and are not expected to be constraining in the future given current fishing effort. Recent landings have been substantially lower than the TALs, suggesting that the TAL is not a constraining factor for profit maximization. Nonetheless, No Action would block increases in the northern silver hake specifications and reduce an opportunity for the fishery and reliant communities if demand for silver hake increases. The No Action alternative would set specifications that do not take into account the most updated data or SSC recommendations for preventing overfishing. While catch remained below the ACL for FY 2020-2022, these specifications would likely have negligible impacts in the short term, setting specifications at levels above SSC recommendations for southern whiting and northern red hake could have long-term negative impacts on the fishery, resulting in long-term negative social impacts.

Alternative 2, Option 1 would likely have slightly positive economic and social impacts. This alternative would take into account SSC recommendations for ABCs and OFLs, and would increase the TAL for northern silver hake. However, the lower TAL for northern red hake may result in a potentially premature closure of the northern red hake fishery if in-season AMs are triggered, having slight negative social and economic impacts caused by the loss in revenue and increase in fishing costs.

Table 1. Summary of direct and indirect impacts on Valued Environmental Components (VECs), comparing Alternative 2 to No Action. No Action impacts are based on the effect that the associated specifications would have on the five VECs. The preferred alternative is shaded.

<table>
<tr><th colspan="2" rowspan="2">Alternative</th><th colspan="5">Direct and Indirect Impacts</th></tr>
<tr><th>Target Species</th><th>Non-target Species</th><th>Protected Species</th><th>Physical Environment & Essential Fish Habitat</th><th>Human Communities</th></tr>
<tr><td colspan="2">Alternative 1: No Action</td><td>Northern silver hake: positive
Southern whiting: moderate negative
Northern red hake: slight positive
Southern red hake: positive</td><td>Overfished species: slight negative
Not overfished species: slight positive</td><td>ESA-Listed species: negligible to slight negative
Non-ESA Listed/ MMPA Protected species: negligible to slight positive</td><td>Slight negative</td><td>Economic: Negligible to slight positive
Social: negligible to slight negative</td></tr>
<tr><td rowspan="2">Alternative 2: 2024-2026 Specifications Adjustment</td><td>Option 1 for Northern red hake TAL</td><td>Northern silver hake: slight positive
Southern whiting: slight positive
Northern red hake: slight positive
Southern red hake: slight positive</td><td>Overfished species: slight negative
Not overfished species: slight positive</td><td>ESA-Listed species: negligible to slight negative
Non-ESA Listed/ MMPA Protected species: slight negative to slight positive</td><td>Slight negative</td><td>Economic: Slight positive
Social: slight positive</td></tr>
<tr><td>Option 2 for Northern red hake TAL</td><td>Northern silver hake: slight positive
Southern whiting: slight positive
Northern red hake: slight positive
Southern red hake: slight positive</td><td>Overfished species: slight negative
Not overfished species: slight positive</td><td>ESA-Listed species: negligible to slight negative
Non-ESA Listed/ MMPA Protected species: slight negative to slight positive</td><td>Slight negative</td><td>Economic: Slight positive
Social: slight positive</td></tr>
</table>

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2.4 ACRONYMS

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ANPR	Advanced Notice of Proposed Rulemaking
AP	Advisory Panel
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
B_{MSY}	Biomass that would allow for catches equal to Maximum Sustainable Yield when fished at the overfishing threshold (F_{MSY})
BiOp, BO	Biological Opinion, a result of a review of potential effects of a fishery on Protected Resource species
CEQ	Council on Environmental Quality
CPUE	Catch per unit of effort
DAS	Day(s)-at-sea
d/K	Ratio of discarded fish to kept catch in weight
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
EA	Environmental Assessment
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
F	Fishing mortality rate
FEIS	Final Environmental Impact Statement
FMP	Fishery management plan
FW	Framework
FY	Fishing year
GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
HAPC	Habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
IFQ	Individual fishing quota
ITQ	Individual transferable quota
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MPA	Marine protected area
MRIP	Marine Recreational Information Program
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NEFMC	New England Fishery Management Council

NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OLE	Office for Law Enforcement (NMFS)
OY	Optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SNE	Southern New England
SNE/MA	Southern New England-Mid-Atlantic
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
TAL	Total allowable landings
TED	Turtle excluder device
TEWG	Technical Expert Working Group
TMS	Ten-minute square
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	Vessel monitoring system
VEC	Valued ecosystem component
VTR	Vessel trip report
WGOM	Western Gulf of Maine
YPR	Yield-per-recruit

3.0 BACKGROUND AND PURPOSE

3.1 Background

This framework adjustment to the Small-Mesh Multispecies Fishery Management Plan (FMP) sets fishery specifications for fishing years (FY) 2024-2026. The Council did not include any other measures for consideration; this action includes fishery specifications only.

3.1.1 Management background

The Small-Mesh Multispecies FMP specifies the management measures for the northern and southern stocks of silver hake (*Merluccius bilinearis*), the northern and southern stocks of red hake (*Urophycis chuss*), and a single stock of offshore hake (*Merluccius albidus*), which primarily co-occurs with the southern stock of silver hake. Catches of silver hake and offshore hake are generally not differentiated in the market and are therefore collectively referred to as "whiting" with the fishery that harvests these species referred to as the "whiting" fishery. Silver hake and red hake are both managed as two distinct stocks, a northern and a southern, based on geographic delineations.

The small mesh multispecies fishery is managed by a collection of exemptions to the Northeast Multispecies FMP. These exemptions allow a fishery to be exempt from the minimum mesh size provided they catch less than 5% of regulated multispecies. There are currently five exemption areas (Map 1) in the northern management area that are open seasonally (Table 3) with possession limits dependent upon the species and mesh size (Table 4). In the southern management area, small-mesh multispecies fishing is open year-round with certain requirements in the Southern New England and Georges Bank regulated mesh area.

Amendment 19 (NEFMC 2012) established an Annual Catch Limit Framework (Figure 1) to comply with new provisions of the Magnuson-Stevens Act. This framework establishes limits on catch and landings for each of the four stocks in the fishery, as well as in-season and post-season accountability measures to compensate for prior catch overages. The framework also established a 3-year specification cycle, beginning in 2012, which has been revised in 2015, 2018, and 2021 to account for new information about stock condition and changes in biomass. An additional adjustment to the northern red hake specifications was also made in 2019. During this time, there were three adjustments to a TAL trigger, to account for ACL overages in the previous fishing year (Table 2). Landings reached the TAL trigger in 2016 and 2017 for northern red hake and in 2020 for southern red hake, which triggered a reduction in the possession limit to 400 lbs. Because of strong year classes of northern red hake and no overfishing occurring recently, the Council reset the northern red hake TAL trigger in the last specifications for the 2021-2023 fishing years to 90% of the TAL and the in-season AM has not been triggered since then.

Table 2. ACL overages and post-season AM actions.

Fishery/Stock	Year of ACL overage	Percent of ACL	Post-season AM adjustment	Effectiveness
Northern Red Hake	2012	127.5	62.5%[1]	May 28, 2015
Northern Red Hake	2015	124.6	37.9%[2]	May 9, 2017
Southern Red Hake	2018	149.6	40.4%[1]	August 25, 2020

[1]Reduced from 90 percent
[2]Reduced from 62.5 percent

Map 1. Small-mesh exemption areas in the Gulf of Maine and on Georges Bank shown in green with open season labels. Northern management area statistical areas are shown in light grey shading. The GOM/GB regulated mesh area is hatched. Habitat management areas and groundfish closure areas are also shown as an outline.

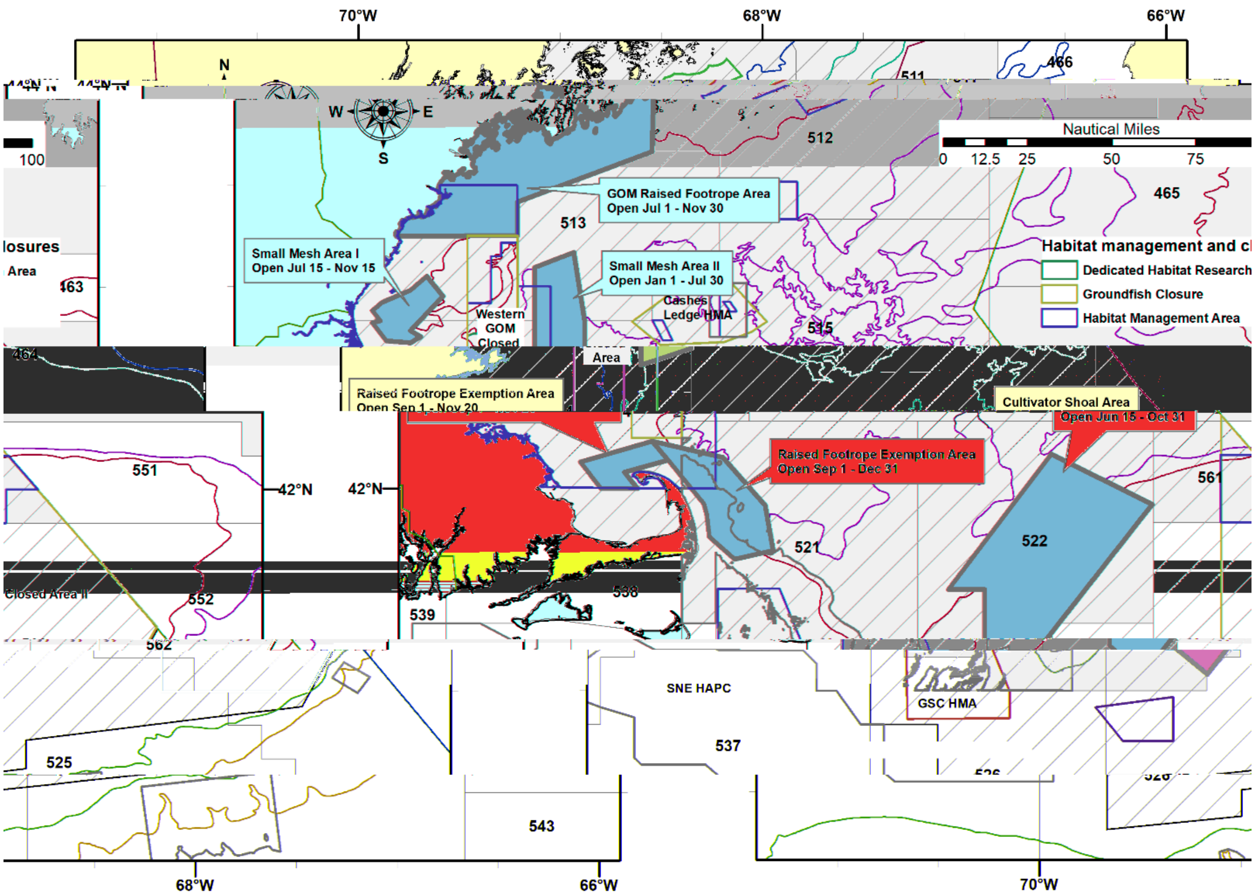


Table 3. Northern area exemption program seasons.

	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Cultivator		June 15 – October 31										
GOM* Grate			July 1 – November 30									
Small I			July 15 – November 15									
Small II	– June 30								January 1 –			
Cape Cod RFT†					Sept 1 – Nov 20							
					September 1 – December 31							

* GOM = Gulf of Maine
† RFT = Raised Footrope Trawl

The Gulf of Maine Grate Raised Footrope area is open from July 1 through November 30 of each year and requires the use of an excluder grate on a raised footrope trawl with a minimum mesh size of 2.5 inches. Small Mesh Areas I and II are open from July 15 through November 15, and January 1 through June 30, respectively. A raised footrope trawl is required in Small Mesh Areas I and II, and the trip limits are mesh size dependent. Cultivator Shoal Exemption Area is open from June 15 – October 31, and requires a minimum mesh size of 3 inches. The Raised Footrope Trawl Exemption Areas are open from September 1 through November 20, with the eastern portion remaining open until December 31. A raised footrope trawl, with a minimum mesh size of 2.5-inch square or diamond mesh, is required. The Southern New England and Mid-Atlantic Regulated Mesh Areas are open year-round and have mesh size dependent possession limits for the small-mesh multispecies.

The mesh size dependent possession limits for all the areas where small-mesh trawl fishing is allowed by exemption are:

Table 4. Mesh size dependent possession limits, subject to in-season accountability measures (triggered when landings exceed the TAL trigger) that would reduce the silver hake and whiting possession limit to 2,000 lb. and the red hake possession limit to 400 lb.

Codend Mesh Size	Silver and offshore hake, combined, possession limit	Northern red hake	Southern red hake
Smaller than 3.0”	15,000 lb	3,000 lb	600 / 1,000 lb
Equal to or greater than 3.0”	30,000 lb (40,000 lb in Southern Management Area)	3,000 lb	600 / 1,000 lb

The Council and NMFS approved Framework 62 (NEFMC 2021b) in January 2022 to initiate rebuilding of southern red hake. At the time, southern red hake biomass was below the minimum biomass threshold and therefore was deemed to be overfished. Also, as a measure to reduce discards, the specifications adjustments for 2021-2023 increased the whiting possession limit from 3,500 lbs. while using trawls with less than 2.5-inch mesh and 7,500 lbs. while using trawls with less than 3-inch mesh to 15,000 lbs. for all trawls using less than 3-inch mesh.

3.2 PURPOSE AND NEED

The purpose for this action is to set annual catch limit specifications including: Overfishing Limit (OFL), the Acceptable Biological Catch (ABC; a limit to account for scientific uncertainty); the Annual Catch Limit (ACL; a limit to account for management uncertainty), Total Allowable Landings (TAL; a Federal-waters landings limit to account for discards and state-water landings), and a TAL trigger (to trigger a reduction in the possession limit to reduce the risk that catches will exceed the ACL). The need for these specification adjustments is to respond to new assessment information and changes in stock biomass, be consistent with the OFL and ABC recommendations of the Council’s Scientific and Statistical Committee, and allow more opportunity for the fishery to achieve optimum yield, while at the same time potentially reducing regulatory discards. The purpose and need for the action are summarized in Table 5.

Table 5. Purpose and need for this action to change specifications.

Action	Purpose	Need
To set specifications including: OFL, ABC, ACL, TAL, and TAL triggers	To adjust catch specifications to be consistent with stock status and changes in biomass.	The action is needed achieve the objectives of the NE Multispecies FMP, prevent overfishing, and achieve optimum yield.

4.0 ALTERNATIVES UNDER CONSIDERATION

The Council considered the alternatives described below in Section 4.1. It did not consider any others because these provide a reasonable range of alternatives to address the purpose and need for action described in Section 3.2. The two alternatives (with options for northern red hake TAL) represent a reasonable range of alternatives for purposes of NEPA analysis given the status of the silver, offshore, and red hake stocks and the requirements of the MSA.

The alternatives in this action would set specifications that determine when overfishing is occurring after accounting for scientific and management uncertainty. These specifications include the Overfishing Limit (OFL), the Acceptable Biological Catch (ABC; a limit to account for scientific uncertainty), the Annual Catch Limit (ACL; a limit to account for management uncertainty), Total Allowable Landings (TAL; a Federal-waters landings limit to account for discards and state-water landings), and a TAL trigger (to trigger a reduction in the possession limit to reduce the risk that catches will exceed the ACL). Specifications are identified for four stocks that are targeted by the small-mesh multispecies fishery: northern silver hake, southern whiting (southern silver and offshore hakes), northern red hake, and southern red hake.

4.1 ALTERNATIVE 1 - NO ACTION

Alternative 1 would continue the existing catch specifications shown in the table below. With No Action, the regulations specify that existing catch specifications will continue (i.e., roll over) for subsequent fishing years until an action is taken to change them, subject to any changes in the TAL trigger due to current year or future catch overages.

Table 6. Small-mesh multispecies fishery specifications that existed in fishing years 2021-2023. Under No Action, these specifications would continue, subject to changes in the TAL trigger due to current year or future overages.

Stock	OFL (mt)	ABC (mt)	ACL (mt)	TAL (mt)	TAL trigger (mt)	TAL trigger (%)
Northern silver hake	39,930	20,410	19,387	17,457	15,711	90%
Southern whiting	72,160	40,990	38,941	28,742	25,868	90%
Northern red hake	N/A	3,452	3,278	1,405	1,265	90%
Southern red hake	N/A	1,505	1,429	422	173	41%

Rationale: The No Action specifications would be consistent with the stock biomass indices for 2017-2019 (as assessed in 2020), exploitation associated with the MSY-proxy for silver hake, the SSC's recommended exploitation rate for red hake, estimated scientific uncertainty for silver hake, and a 5% buffer for management uncertainty. The ABCs and related silver hake specifications account for scientific and management uncertainty by following the procedures identified in the management plan's ACL framework (Figure 1; NEFMC 2012).

These specifications prevented overfishing (except for southern red hake when catches exceeded these limits), and biomass of northern silver hake and northern red hake are among the highest for the time series. These specifications would be more conservative than those in Alternative 2 for northern silver hake and (overfished) southern red hake, but they would be slightly less conservative for northern red hake and considerably less conservative for southern whiting. It is not expected that the No Action specifications would cause small-mesh multispecies stocks to become overfished or reduce the potential for biomass increases of (overfished) southern red hake. The No Action alternative would furthermore keep stable catch limits, which is beneficial for fishing industry planning. None of the No Action specifications are expected to restrict fishing activity due to the low utilization rates for northern silver hake (14.7% of the ACL in fishing year 2022), southern whiting (7.1%), northern red hake (15.8%), and southern red hake (37.3%).

4.2 Alternative 2 – 2024-2026 Specifications Adjustment (Preferred Alternative with Option 2 for Northern Red Hake Preferred)

The Council may select Option 1 or 2 for northern red hake specifications.

Alternative 2 would revise and update the specifications to be consistent with the 2020-2022 biomass estimates from the September 2023 Management Track Assessment. This alternative could be implemented with either Option 1 (Section 4.2.1) or Option 2 (Preferred) (Section 4.2.2), which would apply to northern red hake catch limits, both described below. The OFL and ABC specifications were recommended by the Council's Scientific and Statistical Committee (SSC) based on the management track assessments and recommendations from the Whiting Plan Development Team. The specifications (Table 7) account for updated estimates of scientific uncertainty (silver hake and whiting only), management uncertainty, discards, and state-water landings. These specifications are consistent with the framework (Figure 1) that the Council adopted in Amendment 19 (NEFMC 2012).

Table 7. Updated specifications for fishing years 2024-2026. Option 2 for northern red hake TAL and TAL trigger is preferred.

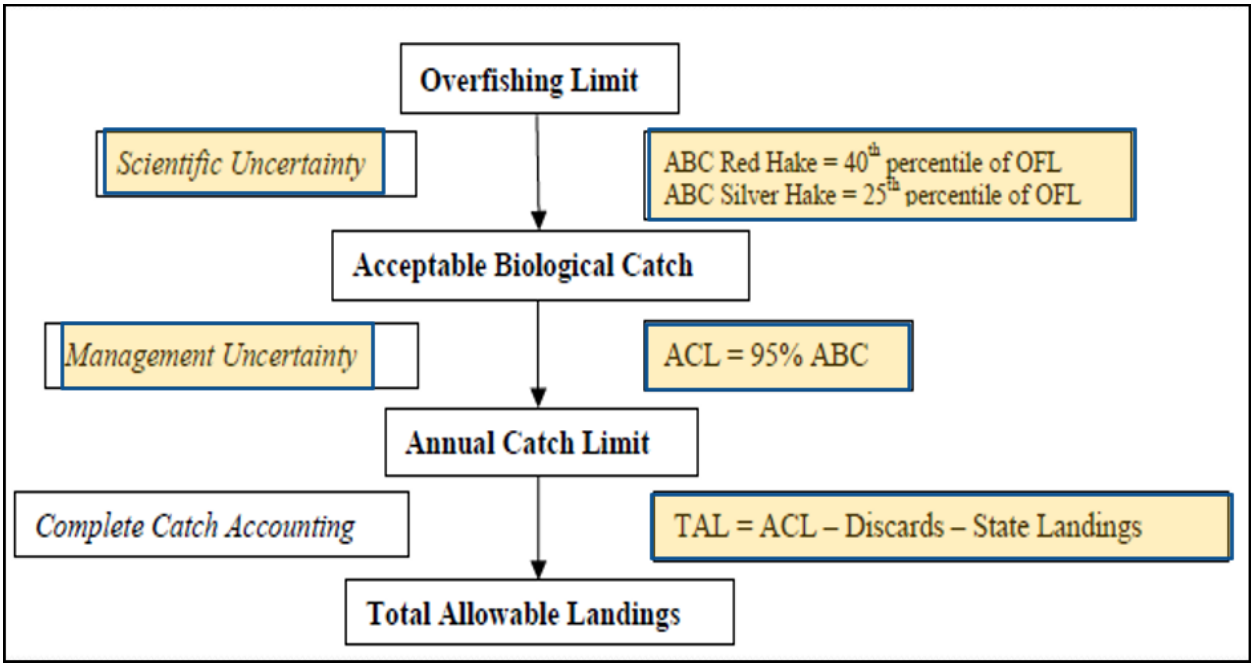
Stock	OFL (mt)	ABC (mt)	ACL (mt)	TAL (mt)	TAL trigger (mt)	TAL trigger (%)
Northern silver hake	79,473	40,868	38,825	31,347	28,212	90%
Southern whiting[1]	35,419	20,149	19,142	13,881	12,493	90%
Northern red hake – Option 1	Unknown	3,129	2,973	213	192	90%
Northern red hake – Option 2 (Preferred)	Unknown	3,129	2,973	1,274	1,147	90%
Southern red hake	Unknown	1,826	1,735	314	129	41%

Table 8. Change in specifications relative to No Action.

Stock	OFL (mt)	ABC (mt)	ACL (mt)	TAL (mt)	TAL trigger (mt)
Northern silver hake	99%	100%	100%	80%	80%
Southern whiting	-51%	-51%	-51%	-52%	-52%
Northern red hake – Option 1	-	-9%	-9%	-85%	-85%
Northern red hake – Option 2 (Preferred)	-	-9%	-9%	-9%	-9%
Southern red hake	-	21%	21%	-26%	-26%

[1] Southern whiting includes southern silver hake and offshore hake (a minor component of catch often landed together with silver hake). Following previously accepted scientific recommendations, the southern whiting specifications include a 4% increase to account for these mixed catches of offshore hake.

Figure 1. Specification framework for small-mesh multispecies stocks.



Rationale: Biomass of all stocks has changed since the 2020 update assessment. In addition, the assessment model formerly used for the red hake stocks has been rejected and replaced with an empirical assessment model. The basis for MSY-proxy remains the 1973-1982 period for silver hake, while the SSC recommended using the following periods for the red hake stocks: 1981-1994 (1.41% exploitation) for the northern stock and 2001-2019 (3.38% exploitation) for the southern stock (NEFMC 2023). Inputs for these specifications include an update to the 3-year (2020-2022) moving average survey biomass indices (fall only for silver hake[2]; mean of spring and fall index for red hake), exploitation associated with MSY-proxy for silver hake, the SSC's recommended exploitation rate for red hake, estimated scientific uncertainty for silver hake, and a 5% buffer for management uncertainty.

The revised specifications use the same MSY-proxy exploitation rate as the Council used for the FY 2021-2023 specifications. The FY 2024-2026 specifications in this alternative reflect updated stock biomass estimates derived from the spring (red hake) and fall (silver and red hakes) bottom trawl surveys to prevent overfishing from occurring for stocks with declining biomass (southern silver hake and northern red hake) and by reducing the Allowable Biological Catch (ABC) and associated specifications.

The increase in ABC and associated specifications are adjustments to account for the large increase in northern silver hake biomass and the moderate increase in southern red hake biomass, estimated from bottom trawl survey data from 2019-2022.[3] The increase in the northern silver hake biomass allows the fishery an opportunity to catch and land optimum yield (accounting for scientific and management uncertainty) if market demand and price improve. Biomass in the fall 2022 survey stood at 28.64 kg/tow, approximately double the value for 2018-2021.

The Council opted not to explore the possibility of reducing the southern red hake Acceptable Biological Catch (ABC) from the recommendation put forth by the Plan Development Team, which applied the

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[2] The southern whiting fall survey indices were averaged only for 2021-2022, due to the missing fall 2020 survey.
[3] Red hake: Fall 2019 to 2022 and Spring 2021 to 2023; Silver hake: Fall 2020-2022, both excluding the 2020 surveys.

mean exploitation rate from 2001-2019 to the 2021-2022 biomass. Following a thorough evaluation of assessment data and the PDT recommendation, the SSC refrained from suggesting any additional reduction at this time, affirming that the current ABC is not expected to lead to overfishing and aligns with rebuilding objectives for this stock.

Moreover, the southern red hake catch in 2022 constitutes only 37.3% of the 2021-2023 ABC, with no anticipated increase in trips targeting southern red hake. While this alternative proposes a 21% increase in the ABC, the Total Allowable Landings (TAL) limit for the southern red hake stock is set lower than No Action, accounting for higher discard rates during fishing years 2020-2022 compared to 2017-2019. Implementing a 26% reduction in the southern red hake TAL serves to curtail the potential rise in directed fishery catches, especially considering the effect of a 600/1,000 lb. possession limit to greatly reduce targeting and promote avoidance during the rebuilding period.

Considering the low exploitation rate, combined with the lower TAL that mainly affects the directed fishery, and the low possession limits required by the rebuilding plan provisions, the increase in the southern red hake ABC is negligible compared to No Action and is in compliance with the rebuilding plan provisions and expected to support rebuilding.

In light of the low exploitation rate, the impact of the reduced TAL predominantly on the directed fishery, the constraining possession limits, and the marginal increase in the southern red hake ABC compared to No Action, the Council concluded that the proposed adjustment is not a threat to rebuilding efforts.

4.2.1 Northern red hake Total Allowable Landings (TAL) Option 1

For Option 1, the specifications for northern red hake would be those shown in Table 7. The TAL would decrease by 85% compared to No Action (Table 8).

Rationale: This measure would deduct from the ACL to determine northern red hake TAL based on 2020-2022 discard estimates, including high northern red hake discard estimates for the lobster trap fishery. It would have a lower risk of catch exceeding the ACL if the lobster fishery northern red hake discards remain high.

4.2.2 Northern red hake Total Allowable Landings (TAL) Option 2 (Preferred Option)

For Option 2, the TAL for northern red hake would be set to account for the discard rate in 2017-2019 (the same rate that is used for No Action), which would keep the TAL rate constant as a fraction of the ACL (Table 7). The TAL would be set at 1,274 mt, a 9% decrease compared to No Action (Table 8).

Rationale: The PDT concluded that the updated red hake discard estimate in the American lobster fishery is highly skewed and uncertain. Excluding this skewed discard rate would reduce northern red hake discard estimate to a customary level and maintain a TAL amount that might otherwise be unnecessarily low (see Option 1). It would increase the TAL from 7% of the ACL under Option 1 to 43% of the ACL (the same rate that was applied in the current specifications based on 2017-2019 northern red hake discard estimates).

The 2020-2022 discard estimates were highly influenced by a small amount of red hake bycatch on one observed lobster trap trip in 2021 and 4 observed trips (totaling 62 lb of red hake bycatch) in 2022. The discard rate (D/Kall) is then applied to total landings, about 50 million pounds of lobsters. These estimates account for about 50% of total estimated discards despite being observed on only a few trips. This skewed estimate would not be applied for setting 2024-2026 northern red hake TAL due to the unusually high uncertainty in these estimates.

Due to the recent high productivity and stock biomass, a substantial buffer between TAL and ACL would exist under Option 2 to account for expected northern red hake discards.

5.0 AFFECTED ENVIRONMENT

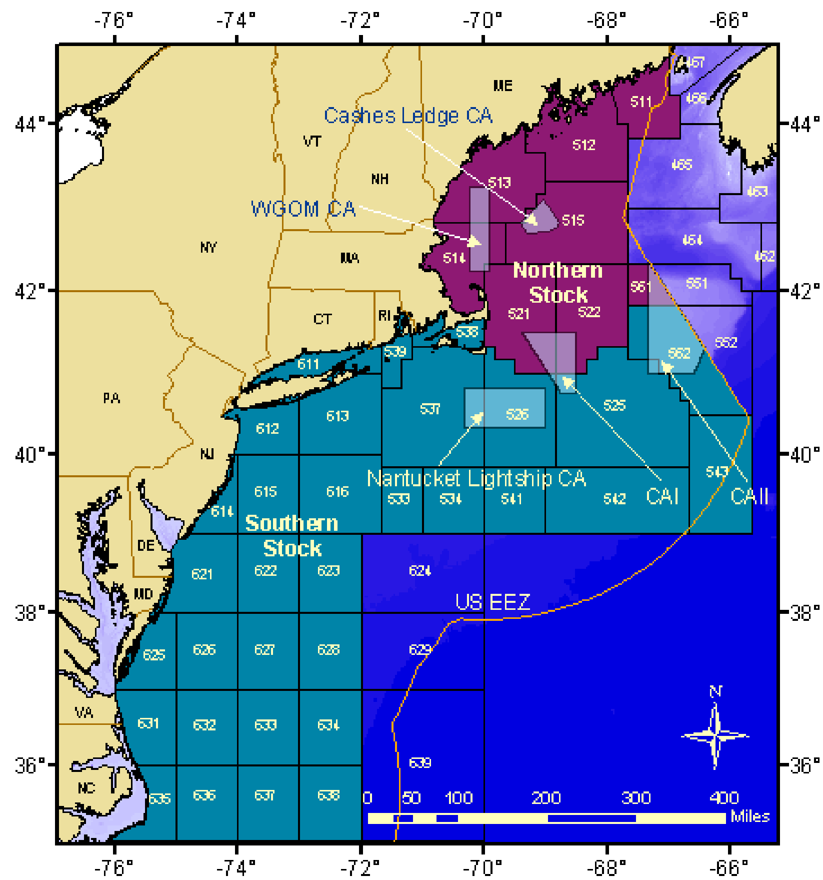
5.1 Introduction

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

5.2 Target Species (Silver, Red, and Offshore Hakes)

The target species for this action are silver hake (*Merluccius bilinearis*), red hake (*Urophycis chuss*), and offshore hake (*Merluccius albidus*). Silver and red hakes are separated into northern and southern stocks for management purpose (Map 2) and assessed as semi-independent stocks. Offshore hake are a minor component in the fishery and are often mixed in commercial fishery catches with southern silver hake, together landed as "whiting".

Map 2. Statistical areas used to define red and silver hake in the northern and southern management areas. Offshore hake statistical areas are restricted to the southern management region only.



These fish are primarily targeted by commercial fishermen using small-mesh trawls in large-mesh exemption areas and seasons. Silver hake is the primary target for the small-mesh multispecies fishery, but trips occasionally target red hake particularly in the northern management area and offshore hake in the southern management area. Offshore and red hakes are mostly landed as non-target species when fishermen target silver hake.

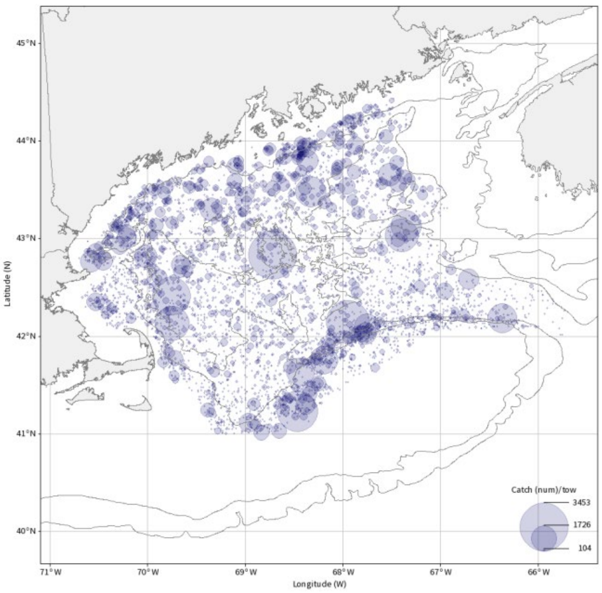
The silver hake population (distribution indexed by the NMFS Bottom Trawl Survey - Map 3) constitutes an important link in the food web dynamics due to their high prey consumption capacity and as food source for major predators in the northwest Atlantic ecosystem. Consumptive estimates of silver hake indicate that predatory consumption represents a major source of silver hake removals from the system and primarily includes goosefish, bluefish, windowpane, four spot flounder, red hake, cod, silver hake, thorny skate, winter skate, little skate, Pollock, and spiny dogfish (Garrison and Link 2000, NEFSC 2011). Silver hake are generally cannibalistic, but their diet varies by region, size, sex, season, migration, spawning and age (Garrison and Link 2000, Lock and Packer 2004, Link et al. 2011).

Over 50 percent of age-2 fish (20 to 30 cm, 8 to 12 in) and virtually all age-3 fish (25 to 35 cm, 10 to 14 in) are sexually mature (O'Brien et al. 1993). Silver hake grow to a maximum length of over 70 cm (28 in) and ages up to 14 years have been observed in U.S. waters, although few fish older than age 6 have been observed in recent years (Brodziak et al. 2001, NEFSC 2011). Silver hake are nocturnal, semi-pelagic predators, moving up in the water column to feed at night, primarily between dusk and midnight and returning to rest on the bottom during the day, preferring sandy, muddy or pebble substrate (Collette and Klein-MacPhee eds. 2002).

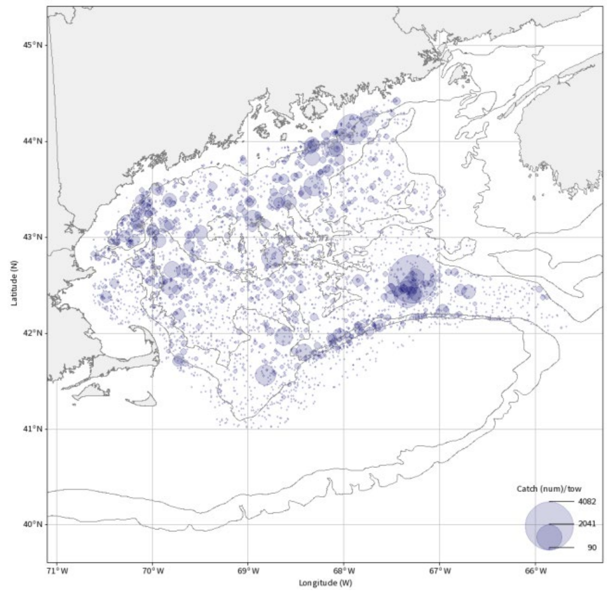
Map 3. Fall (left) and spring (right) survey distribution of silver hake from the NEFSC bottom trawl surveys, 1963-2022. Map Source: [NEFSC 2023]

Northern silver hake

Fall, 1963-2022

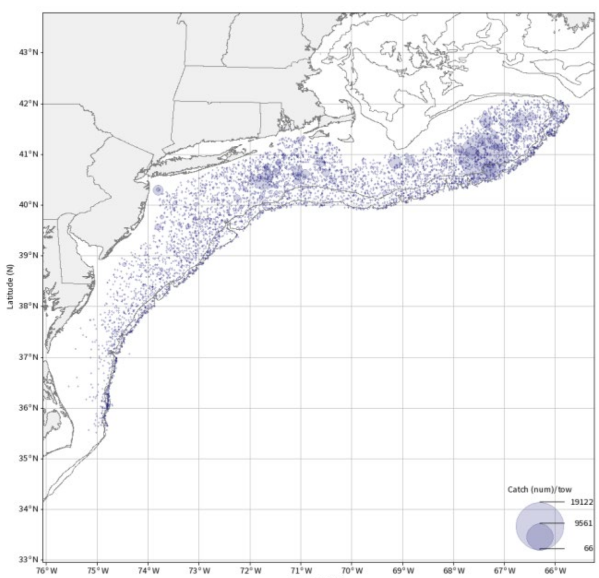


Spring, 1968-2022

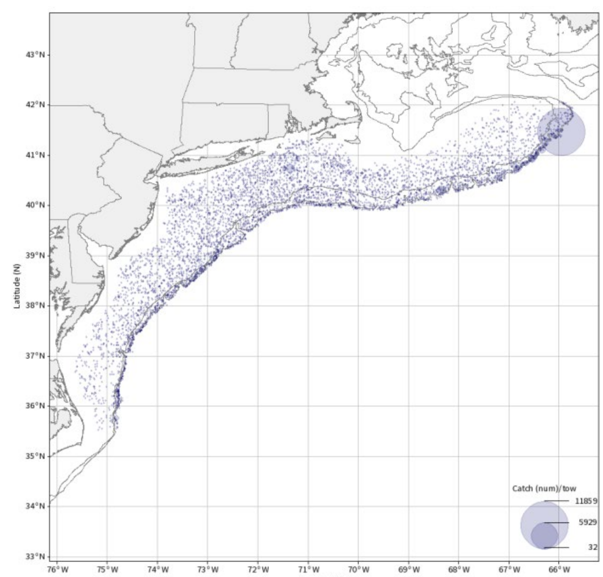


Southern silver hake

Fall, 1963-2022



Spring, 1968-2022

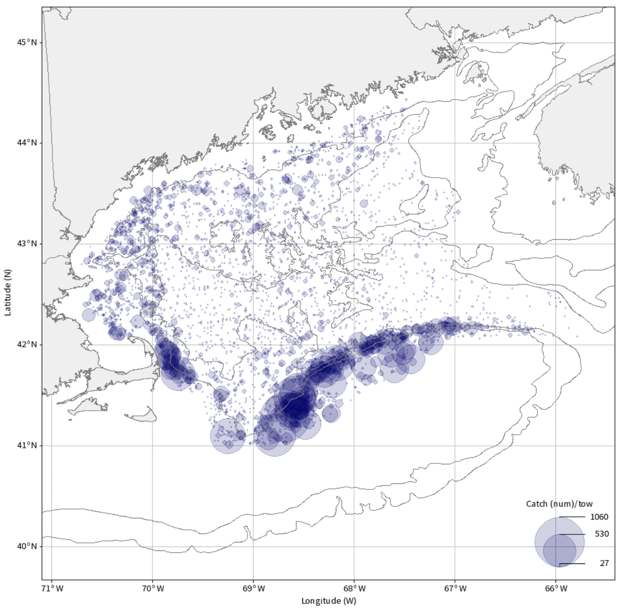


Red hake (distribution indexed by the NEFSC Bottom Trawl Survey - Map 4) prefer soft sand or muddy bottom, and feed primarily on crustaceans such as euphausiids, decapods, and rock crabs as well as fish such as haddock, silver hake, sea robins, sand lance, mackerel and small red hake (Bowman et al. 2000). Primary predators of red hake include spiny dogfish, cod, goosefish, and silver hake (Rountree 1999). As juveniles, red hake seek shelter from predators in scallop beds, and are commonly found in the mantle cavities of (or underneath) sea scallops. In the fall, red hake likely leave the safety of the scallop beds due to their increasing size and to seek warmer temperatures in offshore waters (Steiner et al. 1982).

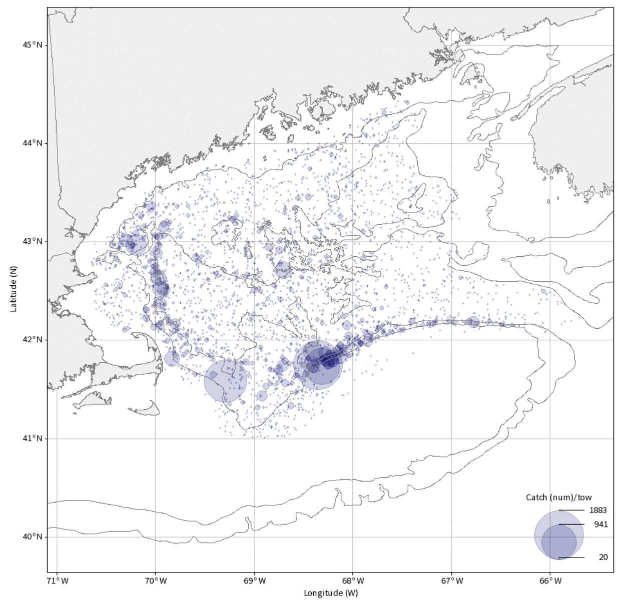
Map 4. Fall (left) and spring (right) survey distribution of red hake from the NEFSC bottom trawl surveys, 1963-2022. Map Source: NEFSC 2023

Northern red hake

Fall, 1963-2022

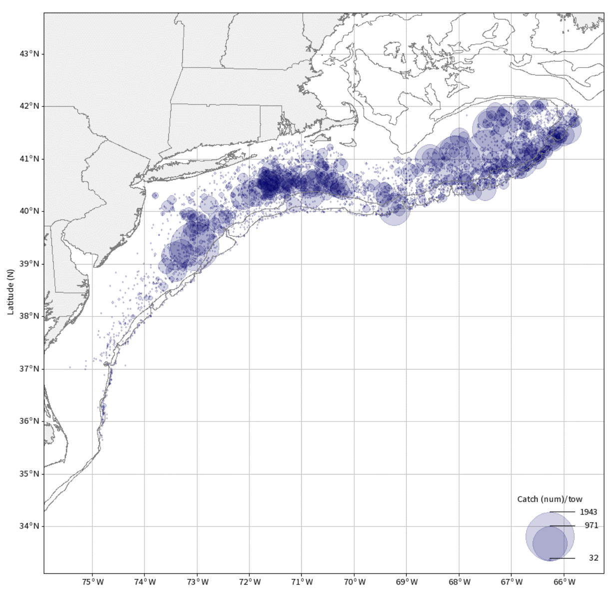


Spring, 1968-2023

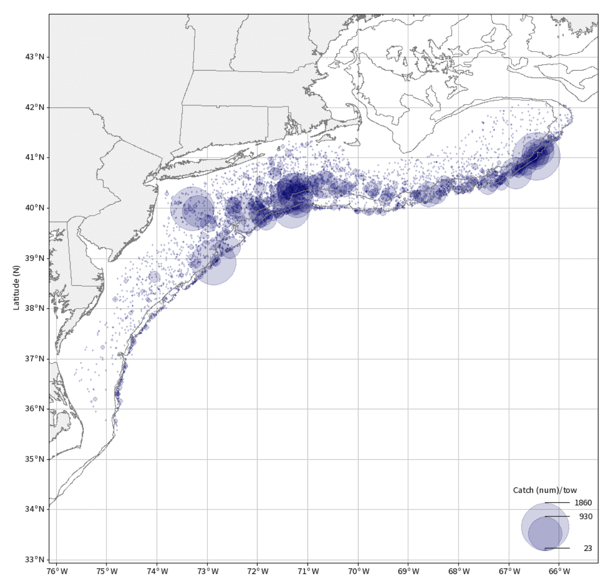


Southern red hake

Fall, 1963-2022

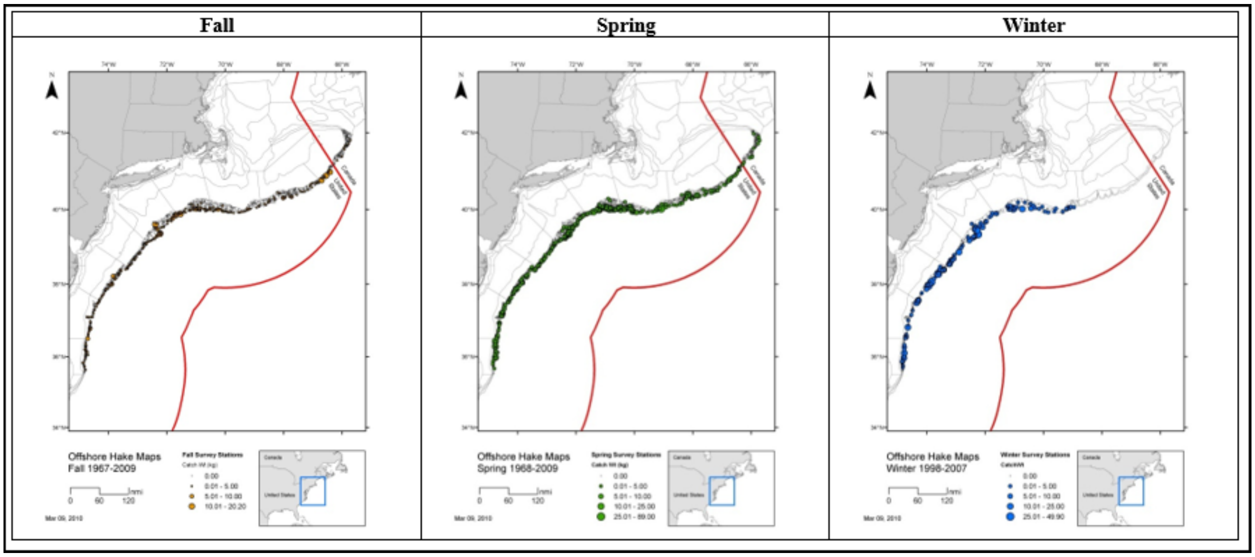


Spring, 1968-2023



Offshore hake are located primarily on the continental shelf and presumably beyond the NEFSC survey area (Map 5). Offshore hake tend to be concentrated in the southern Georges Bank region in the fall, whereas in the spring, they are found further south in the Mid-Atlantic Bight. However, offshore hake appears to be more abundant during the winter months.

Map 5. Fall (left), Spring (middle) and winter (right) survey distribution of offshore hake from the NEFSC bottom trawl surveys, 1967-2009.



5.2.1 Silver hake stock status and life history

Stock status

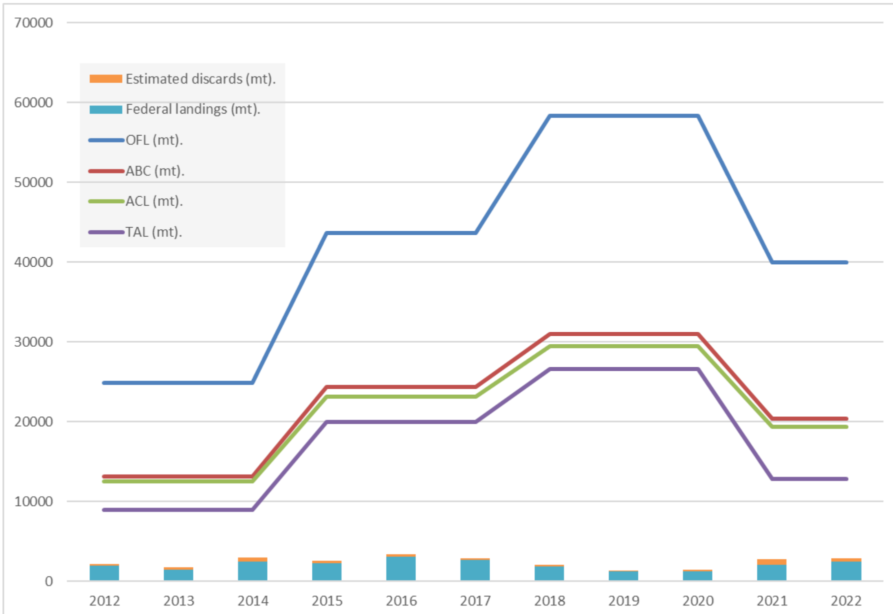
A management track assessment was performed in September 2023 and the results were presented to the Council's Whiting Plan Development Team and its Scientific and Statistical Committee. In the absence of an analytical approach for assessing silver hake, the assessment followed the accepted empirical index-based method from the previous benchmark assessment (NEFSC 2011). The index-based approach is based on the three-year moving average of the NEFSC fall bottom-trawl survey and exploitation index for stock status determination. The assessment results are summarized below, but more details about the northern silver hake assessment are available in the draft assessment report (NEFSC 2023c). More information about the analysis used by the Council to derive catch advice and the catch limit recommendations by the SSC are available on the Council's web site.

The 2023 assessment updated commercial fishery catch data, research survey index and the assessment method based on an empirical approach through 2022. As of 2022, both stocks of silver hake are not overfished and overfishing is not occurring. Exploitation is well below the overfishing threshold and catches since 2012 have been well below the annual specifications (Figure 2).

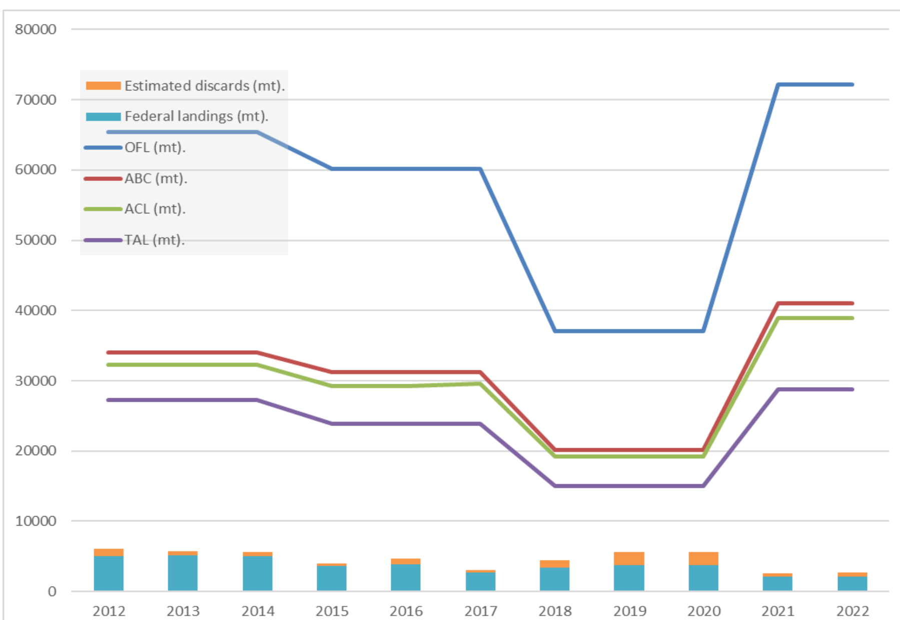
Since the implementation of catch limit specifications in Amendment 19, the northern silver hake and southern whiting stocks have remained healthy and the fishery has experienced some decline in trips, landings, and revenue (NEFMC 2023). Northern silver hake and southern whiting catches in FY 2022 were a small proportion of the ACL (14.7% for northern silver hake and 7.1% for southern whiting). More details about the annual silver hake and whiting catch estimates are in Section 5.1 of the SAFE Report (NEFMC 2023).

Figure 2. Discards and landings of northern silver hake and southern whiting as a proportion of the ACL since Amendment 19.

Northern silver hake

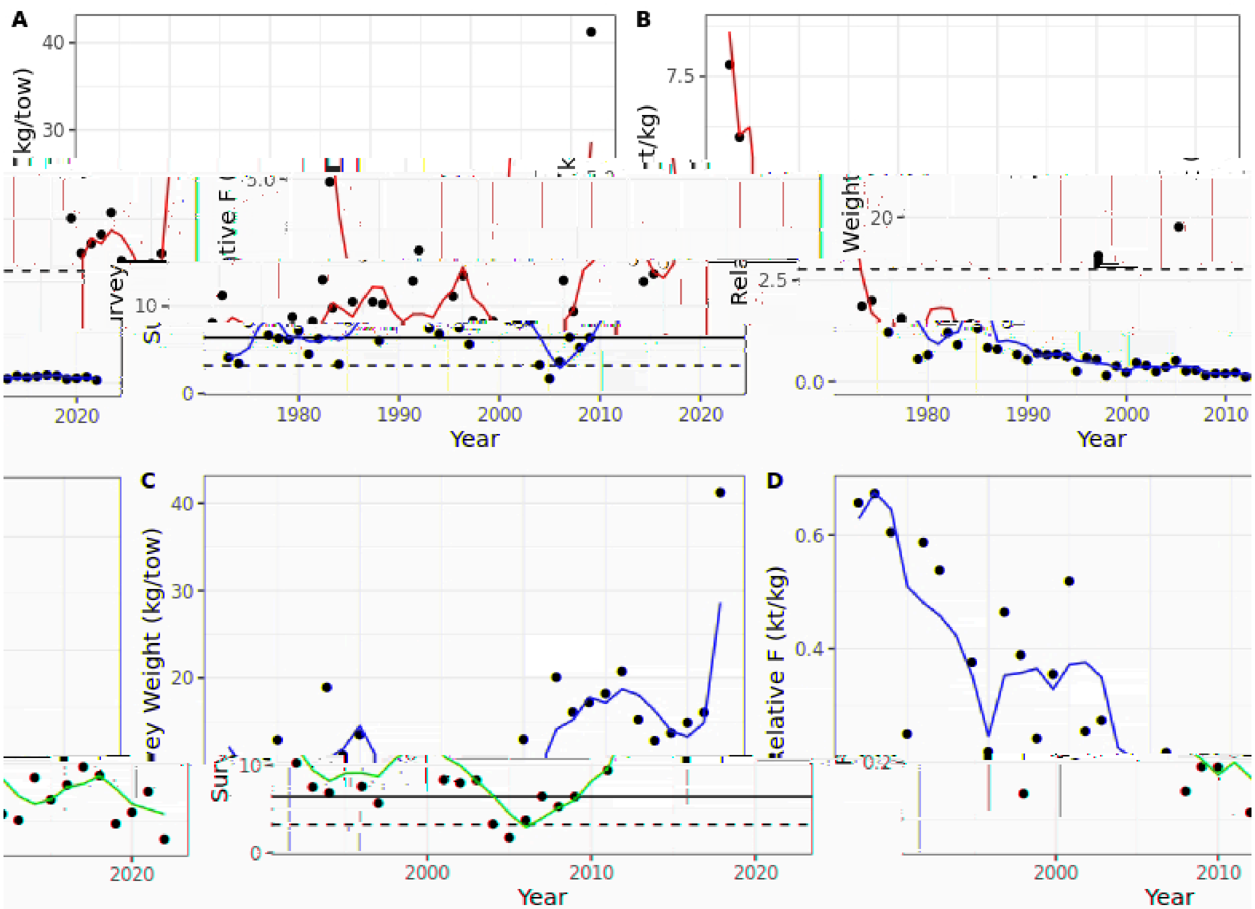


Southern whiting



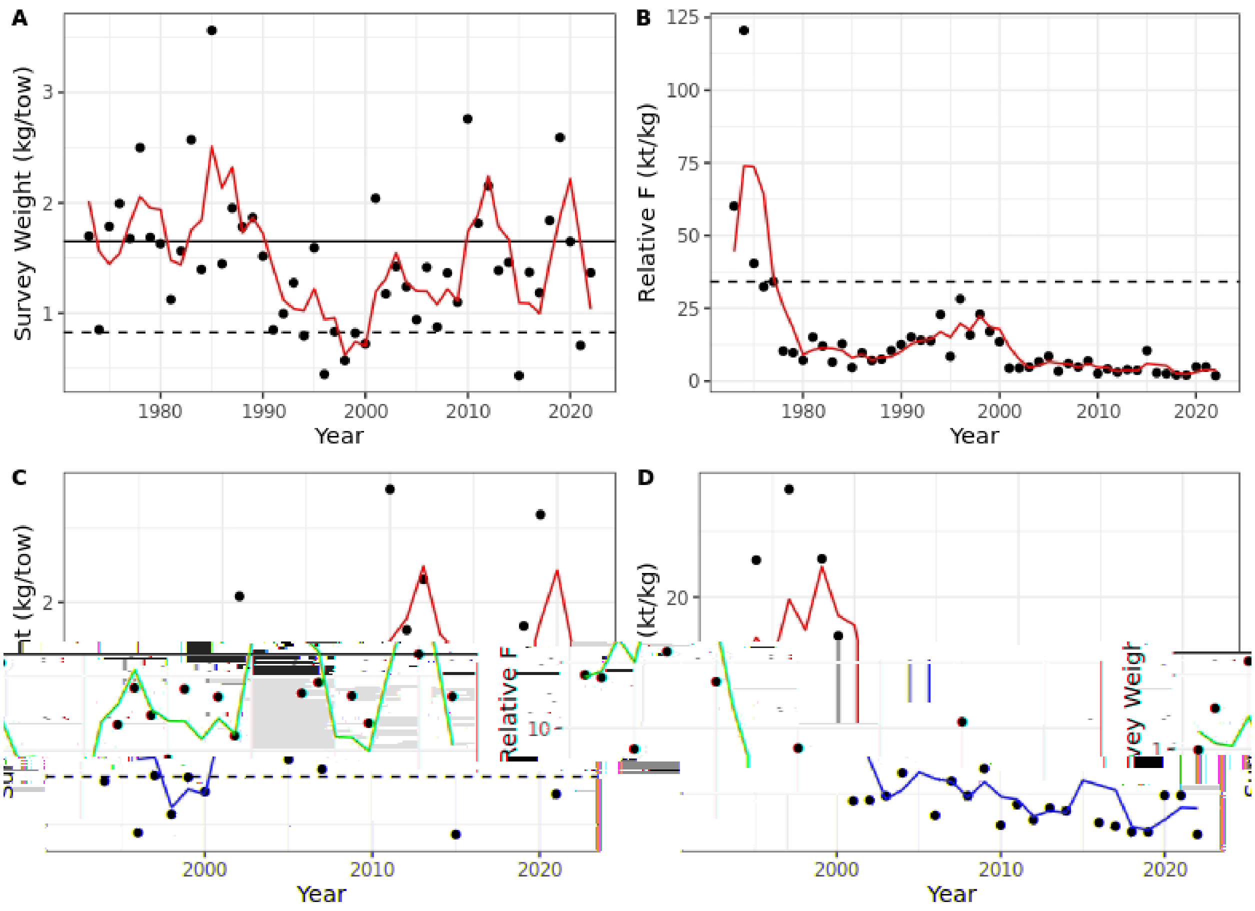
For northern silver hake (Figure 3), the NEFSC fall index (kg/tow) in 2022 (defined as the 3-yr arithmetic average for years 2020-2022), was estimated to be 28.64 kg/tow, which is 446% of the proxy biomass target (B_{MSY} proxy = 6.42 kg/tow). The 2022 exploitation rate (also defined as the 3-yr arithmetic average for years 2020-2022) was estimated to be 0.11, which is 4% of the overfishing proxy threshold (F_{MSY} proxy = 2.77 kt/kg).

Figure 3. Northern silver hake fall survey biomass in kg/tow (A,C) and relative exploitation ratios (B,D) of the total catch to the NEFSC fall survey index in kt/kg and associated 3-yr moving averages (solid red lines). The horizontal dashed lines represent the biomass and overfishing thresholds and the solid horizontal line is the target. Panels C and D reflect the most recent 30 years of the time series. Biomass proxy threshold = 3.21 kg/tow; biomass proxy target = 6.42 kg/tow; overfishing proxy threshold = 2.77 kt/kg.



For southern silver hake (Figure 4), the NEFSC fall index (kg/tow) in 2022 (defined as the 3-yr arithmetic average for years 2020-2022), was estimated to be 1.036 kg/tow, which is 63% of the proxy biomass target (B_{MSY} proxy = 1.65 kg/tow). The 2022 exploitation rate (also defined as the 3-yr arithmetic average for years 2020-2022) was estimated to be 3.878, which is 11% of the overfishing proxy threshold (F_{MSY} proxy = 34.17 kt/kg).

Figure 4. Southern silver hake fall survey biomass in kg/tow (A,C) and relative exploitation ratios (B,D) of the total catch to the NEFSC fall survey index in kt/kg and associated 3-yr moving averages (solid red lines). The horizontal dashed lines represent the biomass and overfishing thresholds and the solid horizontal line is the target. Panels C and D reflect the most recent 30 years of the time series. Biomass proxy threshold = 0.82 kg/tow; biomass proxy target = 1.65 kg/tow; overfishing proxy threshold = 34.17 kt/kg.



<u>Life history</u>

A summary of silver hake life history is provided in Hare et al. (2016). Silver hake is a fast swimming, mostly benthic, marine finfish species that occurs from the Gulf of St. Lawrence to South Carolina, but is most abundant from Nova Scotia to New Jersey (Lock and Packer 2004). The species reaches maturity between 2 and 3 years of age (NEFSC 2011). Spawning occurs in inshore areas of the Gulf of Maine, southern Georges Bank, Nantucket Shoals, and south of Martha's Vineyard to Cape Hatteras (Klein-MacPhee 2002). Spawning begins in January in the southern portion of the range with a peak in spring, and continues to the north with a northern US peak in summer and a Canadian peak in late summer (Lock and Packer 2004). Silver hake are serial spawners with up to three spawning events per season (Klein-

MacPhee 2002). Eggs are pelagic and hatch after about 2 days (Klein-MacPhee 2002). Larvae are pelagic in the upper 40 m of water for approximately 1 month in the southern part of their range to up to 5 months in Canadian waters (Klein-MacPhee 2002; Lock and Packer 2004).

Calanoid copepods are the main prey of larval silver hake (Klein-MacPhee 2002). Larvae first mature into pelagic juveniles that associate with jellyfish, then settle to the benthos at 12-20mm fork length (Klein-MacPhee 2002; Lock and Packer 2004). Benthic juveniles prefer silt or sand bottom with amphipod tubes for cover (Klein-MacPhee 2002). Copepods, amphipods, mysids, euphausiids, and small decapod shrimp are the main prey of juveniles (Klein-MacPhee 2002). Adult silver hake prefer cool waters (3-17°C) at a variety of depths over sand or silt bottom from shallow inshore areas out to 400 m and possibly deeper (Klein-MacPhee 2002). Silver hake are more active and hunt at night for crustaceans, a large variety of small fish, and squid (Klein-MacPhee 2002). An ontogenetic shift from mostly crustaceans to mostly fish and squid prey occurs at 20-25cm, and cannibalism is also quite common in the species (Klein-MacPhee 2002). Some of the many predators of silver hake include: spiny dogfish, little skate, monkfish (goosefish), pollock, Atlantic cod, haddock, hakes, Acadian redfish, sea raven, bluefish, Atlantic mackerel, swordfish, flounders, silver hake, and harbor porpoise (Klein-MacPhee 2002).

Seasonal migrations from inshore summer and autumn habitat to offshore winter and spring habitat are influenced by temperature (Klein-MacPhee 2002). Silver hake also undergo along-shore migrations and the northern and southern stocks mix on Georges Bank in summer (Lock and Packer 2004). Based on a variety of metrics, the Gulf of Maine and Mid-Atlantic stocks are distinct, but the degree of mixing and the location of the boundary between stocks are not well understood (Lock and Packer 2004).

5.2.2 Red hake stock status and life history

Stock status

A management track assessment was performed in September 2023 and the results were presented to the Council's Whiting Plan Development Team and its Scientific and Statistical Committee. The overfished and overfishing status of both red hake stocks is considered unknown. Due to the current high biomass and low exploitation rate of northern red hake, it is likely that the stock is not overfished and overfishing is not occurring. Southern red hake exploitation is very low and the stock biomass is near the overfished threshold. The southern red hake stock is currently in a rebuilding plan (NEFMC 2021b).

Northern red hake

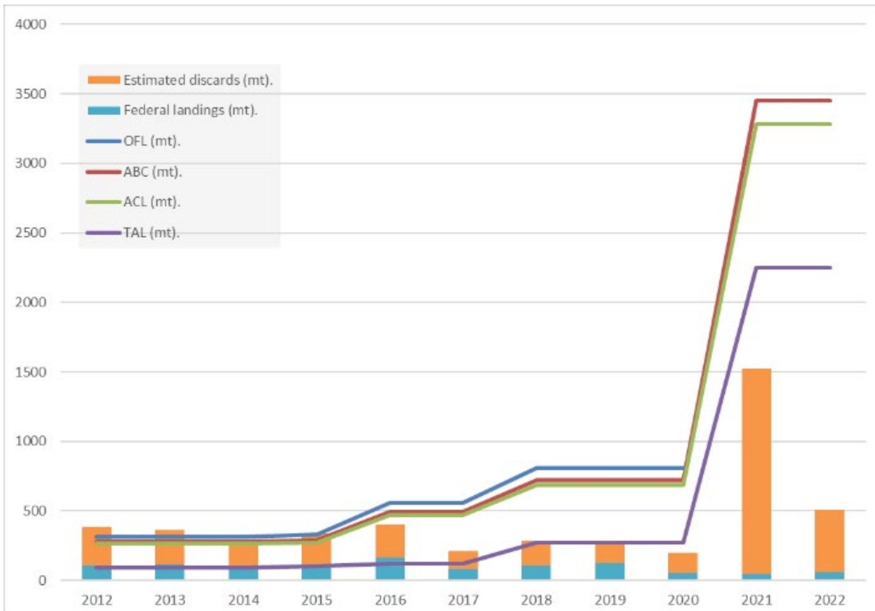
Catches of northern red hake exceeded the ACL in 2012, 2013, and 2015, but the combination of the AMs and high recruitment have allowed the stock to recover and in 2018-2019 the northern red hake catch has averaged only 40 percent of the ACL. Biomass of southern red hake declined while catches (primarily discards in the whiting and squid fisheries) increased in 2018-2019. This resulted in triggering AMs in 2018 and 2019 and the stock was assessed as being overfished. At the time, the average survey biomass during 1980-2010 was deemed to be an acceptable proxy for MSY conditions (NEFMC 2021b) but the most recent assessment (NEFMC 2020a) considered the stock status to be unknown, without MSY reference points. During 2018-2019, catches averaged 147% percent of the ACL, which was based on the former assessment and B_{msy}-proxy reference point. For 2020-2023 the Council raised the northern red hake ABC. Catch averaged 20% of the ACL during 2020-2022. Stock productivity and biomass has increased in recent years.

Southern red hake

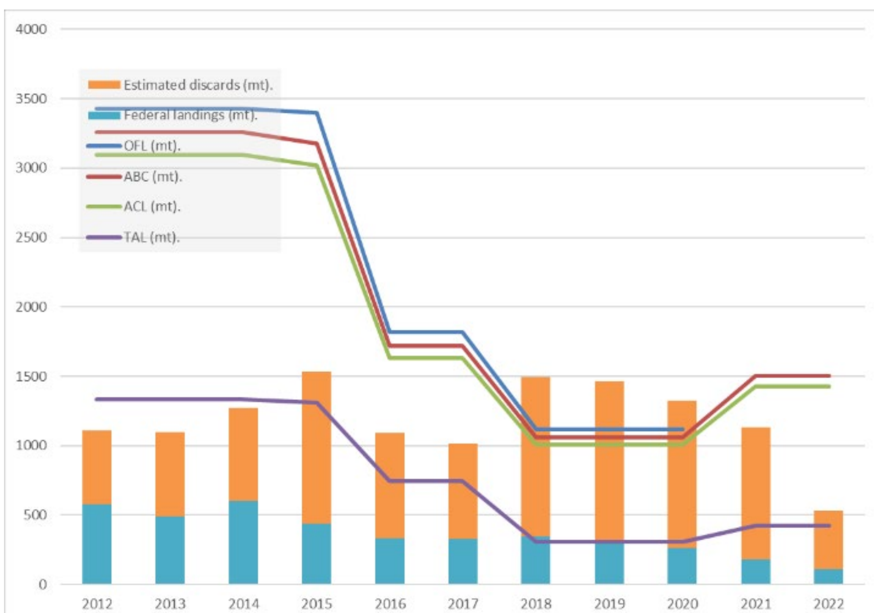
Catches of southern red hake exceeded the ACL in 2018 to 2020 and the biomass declined to below the minimum biomass threshold, prompting the Council to initiate a rebuilding plan via Framework 62 (NEFMC 2021b). Since then, catches have declined, accounting for only 79.0% of the 2021 ACL and 37.3% of the 2022 ACL. Despite this, southern red hake stock productivity and recruitment has remained low and the stock biomass (0.344 kg/tow) is below the overfishing definition threshold (0.507 kg/tow). In 2020, the Council's SSC, however, determined that the low exploitation rate estimates (averaging just 0.21 percent from 2012-2022) were an unlikely driver of changes in stock biomass.

Figure 5. Discards and landings of red hake as a proportion of the ACL since Amendment 19.

Northern red hake



Southern red hake

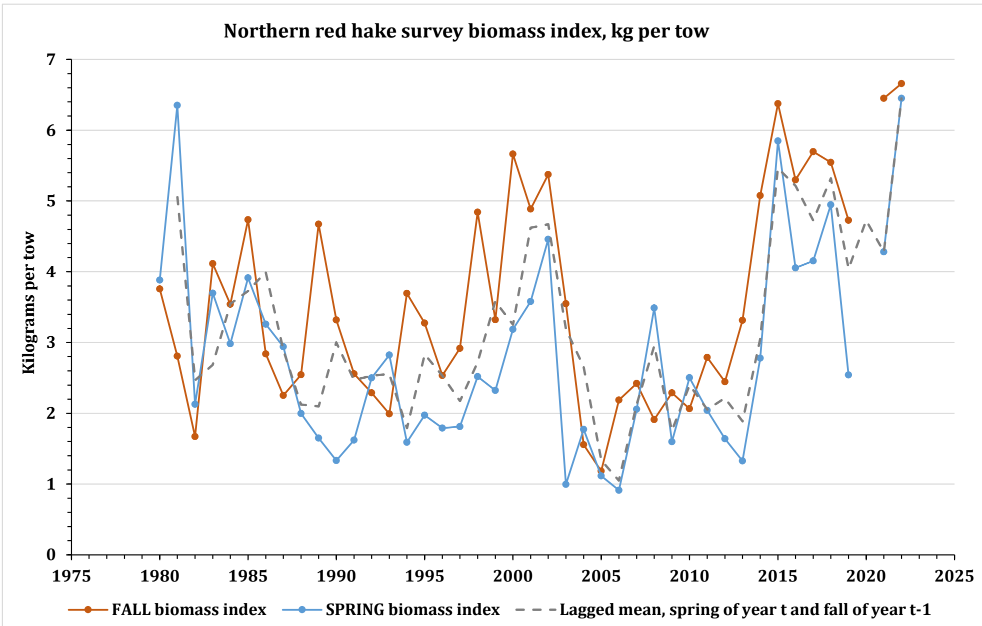


Note: Recreational catch has been included in specifications since 2020, but is not included in these figures. Discards and landings only include data from the Federal commercial fishery.

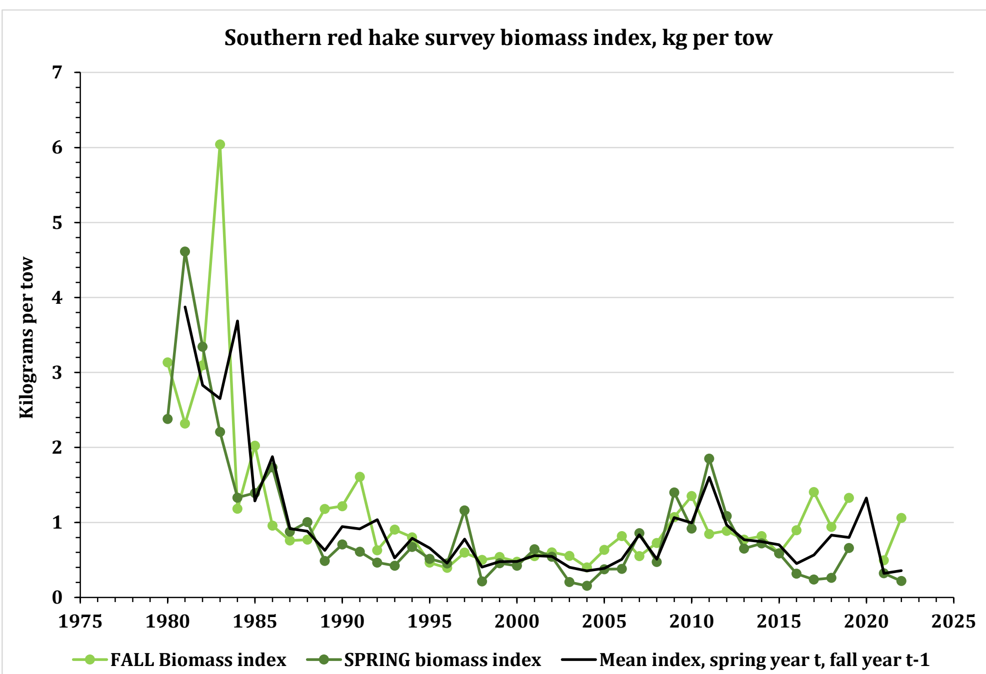
Figure 6. Trends in red hake biomass and exploitation (NEFSC 2023).

NEFSC bottom trawl survey index, 1980-2022. The 2020 values are treated as missing.

Northern red hake

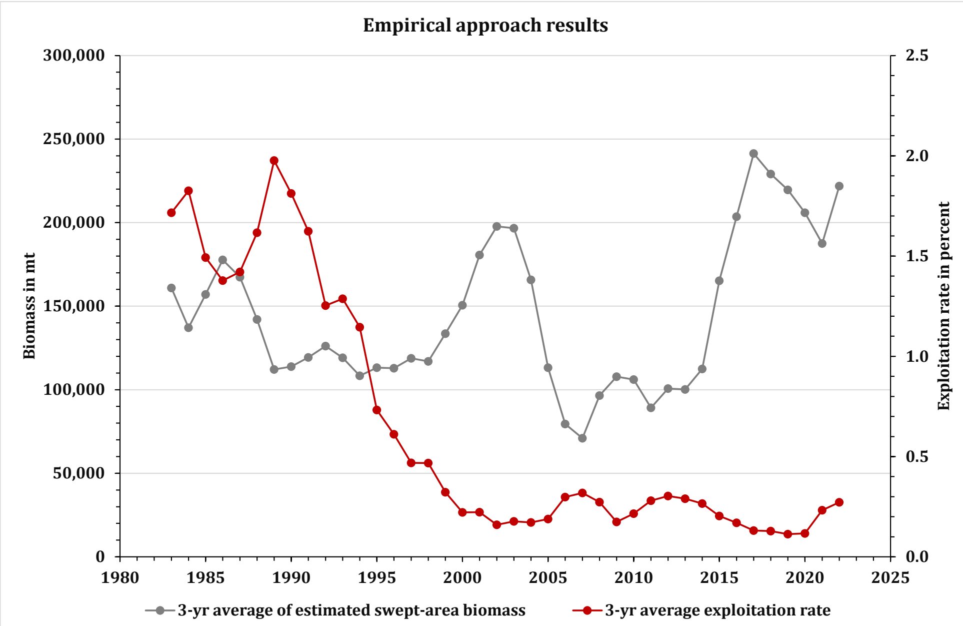


Southern red hake

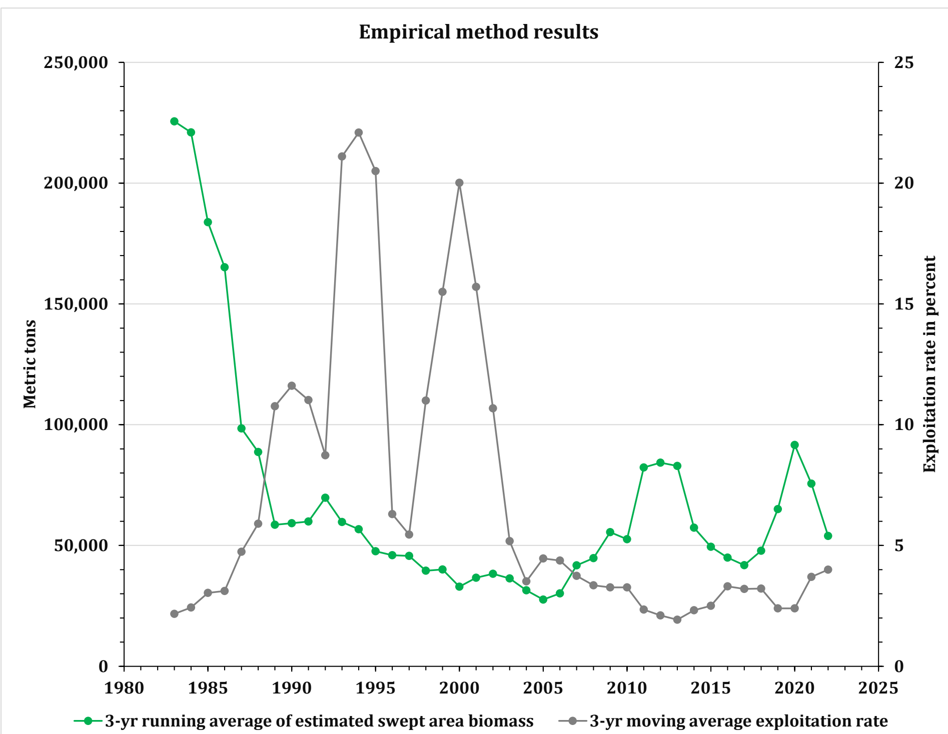


Exploitation rate and swept-area biomass from the empirical approach.

Northern red hake



Southern red hake



Life history

A summary of red hake life history is provided in Hare et al. (2016). Red hake is a marine, demersal species found from the Gulf of St. Lawrence to North Carolina, but is most abundant from the western Gulf of Maine through southern New England (NEFSC 2011). Red hake reach maturity around 1.4 (males) and 1.8 years (females; NEFSC 2011), with females generally older and larger than males (Steimle et al. 1999). Spawning occurs from April through November (July to November in the Gulf of Maine) on the continental shelf and in coastal embayments (Steimle et al. 1999). Spawning in the Mid-Atlantic Bight may produce the majority of recruits (Steimle et al. 1999). Within a week from spawning, buoyant eggs hatch into small pelagic larvae that prey on copepods and other small planktonic crustaceans (Steimle et al. 1999). Larvae transition into pelagic juveniles at approximately 20-30 mm standard length (Fahay 2007) and remain pelagic for approximately 2 months relying on floating debris, sargassum, and jellyfish tentacles for shelter (Steimle et al. 1999). By 35-40 mm total length, red hake begin a gradual descent to the benthos. They settle on fine-sand sediment on the shelf, and in larger estuaries in areas such as Sea Scallop beds, depressions in open seabeds, Atlantic surfclam shells, Moon Snail egg-case collars, anemone and polychaete tubes, debris, and artificial reefs (Steimle et al. 1999). Settlement occurs in September to December, but a strong thermocline may delay descent (Steimle et al. 1999). Throughout the juvenile stage, red hake prey on small crustaceans including larval and small decapod shrimp and crabs, mysids, euphausiids, and amphipods (Steimle et al. 1999).

Red hake are mostly demersal, but can be found in the water column. They tolerate a large range of temperatures but may be sensitive to low dissolved oxygen levels (Steimle et al. 1999). Like juveniles, adult hake prefer soft sediments and use depressions in the sediment, shell beds, and inshore reefs (natural and artificial) for shelter and are rarely found in open sandy bottom (Steimle et al. 1999). Red hake make seasonal migrations influenced by temperature, preferring inshore habitat during warm months, and offshore habitats during colder months (Steimle et al. 1999).

Adult hake prey upon crustaceans, demersal and pelagic fish, and squid (Steimle et al. 1999). Predators on adult and juvenile hake include many large piscivores such as striped bass, spiny dogfish, monkfish (goosefish), other hake species, sea raven, harbor porpoise, and larger red hake (Steimle et al. 1999).

5.2.3 Offshore hake stock status and life history

Offshore hake are not assessed and the status of the stock is unknown. Offshore hake occur primarily in deep water off the edge of the Continental Shelf and occasionally appear in survey and commercial fishery catches. Because offshore hake are landed with silver hake as “whiting”, their catches are accommodated by a 4% increase in the southern whiting catch specifications that are derived from the southern silver hake biomass indices.

A summary of offshore hake life history is provided in Hare et al. (2016). Offshore hake is a marine species found along the outer continental shelf and upper slope from the southern edge of the Grand Banks to the Caribbean and Gulf of Mexico (Klein-MacPhee 2002). The mean length at maturity for this sexually dimorphic species is 23 cm for males and 28 cm for females, who tend to grow faster and live longer than males (NEFSC 2011). The spawning season is long, peaking between April and July, but may continue year-round (Chang et al. 1999; NEFSC 2011). Spawning occurs on the outer continental shelf and presumably also on the slope at or near the sea floor, but produces pelagic eggs (Chang et al. 1999). After 6-8 days, pelagic larvae hatch out of the eggs (Chang et al. 1999). Larvae transform at approximately 20 mm total length, but juveniles may not settle to benthic habitats until 30 mm total length (Chang et al. 1999). Juveniles and adults are demersal, occurring between 80 – 1170 m, but primarily occur around 200 m (Chang et al. 1999). Juveniles consume small fish, shrimp, and crustaceans (Chang et al. 1999). Monkfish (goosefish), larger hakes, and likely other fishes prey on juvenile offshore hake (Chang et al. 1999). Adult offshore hake may make vertical migrations at night and mature females may congregate on deeper parts of the slope than the males and juveniles (Chang et al. 1999; Klein-MacPhee 2002). Adult hakes consume mostly fish, such as Lanternfish, sardines, anchovies, and juvenile conspecifics, but occasionally also include crustaceans and squids in their diet (Chang et al. 1999). The only documented predator of adult offshore hake is monkfish (goosefish); however other predators likely consume the species but are not identified due to difficulty separating offshore hake from silver hake (Klein-MacPhee 2002).

5.3 NON-TARGET SPECIES

In the FY 2020-2022 SAFE Report (NEFMC 2023), the Council's Whiting PDT estimated the bycatch of 21 species that are frequently caught by fishermen targeting whiting and red hake. The analysis included estimates for species in the large-mesh multispecies fishery, some of which are overfished and in a rebuilding program. This analysis focused only on trips fishing with trawl mesh less than 5.5 inches and landing more than 2,000 lbs of whiting or 400 lbs. of red hake, i.e. trips targeting small-mesh multispecies with small-mesh trawls.

For the 21 species with previous small-mesh multispecies discard estimates, total discards declined from 2,649 mt/year to 1,880 mt/year. The top three species that are discarded in the small-mesh multispecies fishery were silver hake, butterfish, and red hake, representing 42.4% of the estimated total discards and 10.6% of total kept, or 2,395 mt (Table 9). Estimated bycatch of overfished groundfish stocks include winter flounder, ocean pout, yellowtail flounder, witch flounder, windowpane flounder, cod and white hake (Table 11), which contributed to only 3.1% of the estimated total discards and 0.8% of total kept, or 173 mt. Atlantic herring is also overfished and accounted for 0.6% of estimated bycatch and 0.2% of total kept, or 36 mt during fishing years 2020-2022.

Excluding silver and red hakes, the average discard rate was 27% of total landings on small-mesh multispecies trips (>2000 lbs. silver hake or >400 lbs. red hake). The discard rate (Table 10) was higher in the Mid-Atlantic (23 to 43%) than for Georges Bank and Southern New England (21 to 37%) and the Northern Management Area (Gulf of Maine and northern Georges Bank; 18 to 26%). Not accounting for discarding of the target species (presumably due to size or limited dockside demand), the higher discard rate primarily comes from butterfish and scup, both targeted with small mesh trawls in the Mid-Atlantic and Southern New England. Large-mesh groundfish discard rates were highest in the northern management area (0.7 to 1.9% D/Kall; 3.0 to 7.5% of total discards) than for Georges Bank/Southern New England (0.4 to 0.6% D/Kall; 1.6 to 2.0% of total discards) and the Mid-Atlantic (0.3 to 0.6% D/Kall; 0.9 to 2.1% of total discards).

Table 9. Top ranked and important groundfish bycatch discard estimates for 2020-2022 compared to previous estimates for 2017-2019. The grand total includes discard estimates for species not listed in the table.

Species	2017-2019 rank	2017-2019 estimate, mt	2020-2022 rank	2020-2022 estimate, mt
Red hake	1	1,967	3	403
Silver hake	2	1,692	1	1,088
Spiny dogfish	3	890	4	341
Butterfish	4	774	2	904
Little skate	5	568	5	189
Atlantic herring	6	383	11	36
Winter skate	7	311	8	115
Haddock	8	282	16	14
Winter flounder	9	209	17	14
Fluke	10	187	9	101
Barndoor skate	11	148	6	170
Monkfish	12	129	7	163
Ocean pout	13	113	19	8
Yellowtail flounder	14	92	12	35
Witch flounder	15	66	14	16
Windowpane flounder	16	51	10	38
American plaice	17	46	18	13
Thorny skate	18	18	15	15
Cod	19	13	21	2
White hake	20	10	20	7
Smooth skate	21	0	13	16
Grand total		**7,948**	-	**5,639**

Table 10. Discard estimates in the small-mesh multispecies fishery for the top 30 species by region and fishing year, 2020-2022.

Values	Northern Management Area			Georges Bank/Southern New England			Mid-Atlantic			2020-2022 Total
	2020	2021	2022	2020	2021	2022	2020	2021	2022	
Total Trips	115	212	281	983	505	422	555	203	84	3,213
Observed Trips	6	15	33	8	16	17	0	4	2	100
Total Kept, mt	1,721	3,476	4,468	4,038	3,120	2,724	1,590	642	333	22,112
Kept Whiting, mt	1,161	1,898	2,300	2,718	1,686	1,641	618	154	108	12,282
Kept red hake, mt	31	34	53	78	78	62	103	36	8	484
Discards, mt	554	818	785	1324	641	679	603	145	89	5,639
D/Kall	39%	26%	18%	37%	21%	26%	43%	23%	27%	27%
D/Kall LM groundfish	1.85%	0.71%	1.31%	0.61%	0.40%	0.39%	0.34%	0.46%	0.56%	0.78%
D/Dall LM groundfish	5.75%	3.00%	7.48%	1.87%	1.96%	1.55%	0.89%	2.03%	2.09%	3.07%
Silver hake	265	228	97	300	19	44	126	3	5	1088
Butterfish	68	112	100	175	200	115	67	34	32	904
Scup	0	0	0	378	144	156	147	39	12	876
Red hake	30	72	62	127	35	18	50	5	2	403
Spiny dogfish	25	62	111	56	33	38	11	2	3	341
Short-fin squid	16	28	7	42	38	12	36	9	3	190
Little skate	3	11	8	34	15	51	52	12	5	189
Barndoor skate	17	48	26	29	18	15	13	2	2	170
Atlantic long-fin squid	15	17	21	38	33	19	14	4	2	163
Monkfish	15	39	57	22	8	8	11	2	1	163
Jonah crab	11	33	66	9	4	6	5	1	3	138
American lobster	13	44	58	3	5	6	0	0	0	130
Winter skate	12	22	31	12	10	22	2	2	1	115
Black sea bass	3	15	29	9	19	22	4	6	3	110
Fluke	10	12	11	20	15	13	14	4	2	101
Unclassified skate	0	4	3	4	3	78	4	1	2	100
Windowpane flounder	12	3	0	11	4	4	2	1	1	38
Atlantic herring	5	17	4	4	0	0	5	0	0	36
Yellowtail flounder	7	11	13	2	1	0	0	0	0	35
Clearnose skate	0	0	2	0	2	4	19	4	3	34
Smooth dogfish	1	1	1	11	5	7	6	2	1	34
Sea scallop	0	5	3	4	7	5	2	5	1	32
Alewife	2	1	3	4	2	13	1	0	0	25
American shad	2	3	3	5	3	3	3	0	0	20
Atlantic mackerel	1	3	3	2	4	4	1	1	0	19
Pollock	1	1	17	0	0	0	0	0	0	19
Smooth skate	4	5	8	0	0	0	0	0	0	16
Witch flounder	2	2	4	4	0	1	2	0	1	16
Red crab	0	0	3	0	1	4	0	1	6	15
Thorny skate	1	8	6	0	0	0	0	0	0	15

Table 11. Current status of groundfish stocks, determined by NOAA Fisheries (NOAA 2023).

Stock	Status	
	Overfishing?	Overfished?
Georges Bank Cod	Yes	Yes
Gulf of Maine Cod	Yes	Yes
Georges Bank Haddock	No	No
Gulf of Maine Haddock	Yes	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 - Rebuilt
American Plaice	No	No
Witch Flounder	Unknown	Yes
Georges Bank Winter Flounder	No	No - Rebuilding
Gulf of Maine Winter Flounder	No	Unknown
Southern New England/Mid-Atlantic Winter Flounder	No	No - Rebuilt
Acadian Redfish	No	No
White Hake	No	No - Rebuilding
Pollock	No	No
Northern Windowpane Flounder	No	Yes
Southern Windowpane Flounder	No	No
Ocean Pout	No	Yes
Atlantic Halibut	Unknown	Yes - Rebuilding
Atlantic Wolffish	No	Yes

5.4 Protected Species

Numerous protected species occur in the affected environment of the small-mesh multispecies fishery (Table 12) and have the potential to be impacted by the proposed action (i.e., there have been observed/documented interactions in the fishery or with gear types similar to those used in the fishery (e.g., bottom trawl 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 12. Species protected under the ESA and/or MMPA that may occur in the affected environment of the small-mesh multispecies fishery. Marine mammal species italicized and in bold are considered MMPA strategic stocks.[1]

Species	Status	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***No***
Humpback whale, West Indies DPS (*Megaptera novaeangliae*)	Protected (MMPA)	Yes
Fin whale (Balaenoptera physalus)	***Endangered***	***No***
Sei whale (Balaenoptera borealis)	***Endangered***	***No***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***No***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale *(Globicephala spp.)*[2]	*Protected (MMPA)*	Yes
Pygmy sperm whale (*Kogia breviceps*)	Protected (MMPA)	No

Species	Status	Potentially impacted by this action?
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)**	***No***
Bottlenose dolphin, WNA Southern Migratory Coastal Stock (Tursiops truncatus)	**Protected (MMPA)**	***No***
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	No
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
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
[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		

Species	Status	Potentially impacted by this action?
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*.		

5.4.1 Species and Critical Habitat Not Likely to be Impacted by the Proposed Action

Based on available information, it has been determined that this action is not likely to impact multiple ESA listed and/or MMPA protected species or any designated critical habitat (Table 12). 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 10 years of information, there have been no observed or documented interactions between the species and the primary gear type (i.e., bottom trawl) used to prosecute the small-mesh 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 Reference Documents, Publications, or Technical Memoranda; MMPA List of Fisheries (LOF); NMFS 2021a).[4] In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 12 and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2021a).

5.4.2 Species Potentially Impacted by the Proposed Action

Table 12 provides a list of protected species of sea turtle, marine mammal, and fish species present in the affected environment of the small-mesh multispecies fishery, and that may also be impacted by the proposed action (e.g., have the potential to become entangled or bycaught in the fishing gear used to prosecute the small-mesh multispecies 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 Reference Documents, Publications, or Technical Memoranda 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 FMP and how the fishery (or fisheries) within the FMP will overlap in time and space with this occurrence; and (2) data and observed records of protected species

[4] For MMPA protected species, the most recent 10 years of information on estimated bycatch of small cetacean and pinnipeds in commercial fisheries covers the timeframe between 2011-2020; for large baleen whales, confirmed human caused serious injury, mortality, and entanglement reports are from 2012-2021. For ESA listed species, information on observer or documented interactions with fishing gear is from 2013-2022.

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 small-mesh multispecies fishery and on protected species interactions with specific fishery gear is provided below.

5.4.2.1 Sea Turtles

Below is a brief summary of the status and trends, as well as the occurrence and distribution of sea turtles in the affected environment of the small-mesh multispecies fishery. Additional background information on the range-wide status of affected sea turtles species, as well as a description and life history of each of these species, can be found in a number of published documents, including NMFS (2021a); sea turtle status reviews and biological reports (NMFS 2015; NMFS and USFWS 2007b, 2013, 2015, 2020, 2023; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009), and recovery plans for the loggerhead (Northwest Atlantic DPS) sea turtle (NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a, 2020), Kemp's ridley sea turtle (NMFS et al. 2011), and green (North Atlantic DPS) sea turtle (NMFS and USFWS 1991).

Status and Trends

Four sea turtle species have the potential to be impacted by the proposed action: Northwest Atlantic Ocean DPS of Loggerhead, Kemp's ridley, North Atlantic DPS of green, and leatherback sea turtles (Table 12). Although stock assessments and similar reviews have been completed for sea turtles none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species.

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

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 (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 continue 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; 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 offshore of North Carolina, particularly south of Cape Hatteras, 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 2013; 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).

5.4.2.2 Large Whales

Status and Trends

Two large whale species have the potential to be impacted by the proposed action: Humpback and minke whales (Table 12). Review of large whale stock assessment reports covering the period of 2011 through 2020, indicate that for humpback and minke whales, it is unknown what the population trajectory is as a trend analysis has not been conducted. For additional information on the status of these large whale species, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

Occurrence and Distribution

Large whale species, such as humpback and minke whales, occur in the Northwest Atlantic. Generally speaking, large whales follow an annual pattern of migration between low latitude (south of 35°N) wintering/calving grounds and high latitude spring/summer/fall foraging grounds (primarily north of 41°N; NMFS Marine Mammal SARs for the Atlantic Region); however, this is an oversimplification of whale movements. Survey data, both visual and acoustic, indicate high internal variability in large whale use of some habitats in the Northwest Atlantic, with increasing evidence suggesting that for some species, some portion of the population remains in higher latitudes throughout the winter (Clapham et al. 1993; Davis et at. 2017; Davis et al. 2020; Quintana-Rizzo et al. 2021, Swingle et al.1993; Vu et al. 2012; NMFS Marine Mammal SARs for the Atlantic Region). Although further research is needed to provide a clearer understanding of large whale movements and distribution throughout the year, especially as environmental conditions continue to change (e.g., Meyer- Gutbrod et al. 2021, 2022), the occurrence of large whales in low latitude foraging grounds in the spring/summer/fall is well understood. Large whales consistently return to these foraging areas each year, therefore these areas can be considered important areas for whales (Davis et al. 2017; Davis et al. 2020; Payne et al. 1986; Payne et al. 1990; Schilling et al. 1992; NMFS Marine Mammal SARs for the Atlantic Region). For additional information on the biology and range wide distribution of large whale species, including humpback and minke whales, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

5.4.2.3 Small Cetaceans and Pinnipeds

Status and Trends

Risso's, white-sided, short beaked common, and bottlenose dolphins (Western North Atlantic Offshore stock); long and short–finned pilot whales; and harbor porpoise could be impacted by the proposed action (Table 12). A trend analysis has not been conducted for Risso's, white-sided, short-beaked common dolphins; long-finned pilot whales or harbor porpoise; as a result, the population trajectory for these species is unknown (Hayes et al. 2021). 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 bottlenose dolphin 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).

Table 12 also identifies harbor, gray, harp and hooded seals as having the potential to be impacted by the proposed action. Based on Hayes et al. (2019; 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

Small cetaceans can be found throughout the year in the Northwest Atlantic Ocean (Maine to Florida); however, within this range, there are seasonal shifts in species distribution and abundance. Pinnipeds are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35°N). For additional information on the biology and range wide distribution of each species of small cetacean and pinniped, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

5.4.2.4 Atlantic sturgeon

Status and Trends

As provided in Table 12, Atlantic sturgeon (all five DPSs) have the potential to be impacted by the proposed action. 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).

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 could be located anywhere in this marine range (Altenritter et al. 2017; ASMFC 2017; ASSRT 2007; Breece et al. 2016; Breece et al. 2018a; Dadswell 2006; Dadswell et al. 1984; Dovel & Berggren 1983; Dunton et al. 2015; Dunton et al. 2010; 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. 2015a; Wirgin et al. 2015b).

Based on fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies in the marine environment, Atlantic sturgeon appear to typically 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; Breece et al. 2018b; Collins & 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). In addition to depth, numerous studies have demonstrated that temperature is a key variable in Atlantic sturgeon presence and distribution in the marine environment (Altenritter et al. 2017; Breece et al. 2018b; Erickson et al. 2011; Ingram et al. 2019; Novak et al. 2017; Rothermel et al. 2020; Wippelhauser et al. 2017). Data from fishery-independent and dependent surveys, and 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. 2018b; Dunton et al. 2010; Erickson et al. 2011; Ingram et al. 2019; Novak et al. 2017; Rothermel et al. 2020; Wippelhauser 2012; Wippelhauser et al. 2017). When in the marine environment, Atlantic sturgeon presence and distribution in nearshore or offshore environments also appears to be seasonally variable; with preference for shallow, coastal waters in the spring, more offshore waters in the late fall-winter, and mouths of estuaries in the summer. Residency times in these areas of the marine environment are variable, with suitable environmental conditions (e.g., depth and temperature) dictating residency in an area (Altenritter et al. 2017; Breece et al. 2018b; Erickson et al. 2011; Ingram et al. 2019; Novak et al. 2017; Rothermel et al. 2020; Wippelhauser et al. 2017).

More 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 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017), and NMFS (2021a).

5.4.2.5 Atlantic salmon

Status and Trends

As provided in Table 12, Atlantic salmon (GOM DPS) have the potential to be impacted by the proposed action. 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; NMFS and USFWS 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 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).

5.4.3 Gear Interactions and Protected Species

Protected species are at risk of interacting 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, the most recent 10 years of information on estimated bycatch of small cetacean and pinnipeds in commercial fisheries covers the timeframe between 2011-2020; for large baleen whales, confirmed human caused serious injury, mortality, and entanglement reports are from 2012-2021 (GAR Marine Animal Incident Database, unpublished data; Hayes et al. 2017; 2018; 2019; 2020; Hayes et al. 2021; Hayes et al. 2022; Hayes et al. 2023; Henry et al. 2017; Henry et al. 2016; Henry et al. 2020; Henry et al. 2021; Henry 2022; Henry et al. 2022; Henry et al. 2023; Henry et al. 2019; Waring et al. 2016). For ESA listed species, the most recent 10 years of data on observed or documented interactions is available from 2013-2022 (ASMFC 2017; Kocik et al. 2014; NMFS 2021a; unpublished data: GAR Marine Animal Incident Database, NMFS NEFSC observer/sea sampling database, GAR Sea Turtle and Disentanglement Network, NMFS Sea Turtle Stranding and Salvage Network) (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC protected species serious injury and mortality Reference Documents, Publications, or Technical Memoranda).

Available information on gear interactions with a given species (or species group) is provided in the sections below. However, the following sections 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 small-mesh multispecies fishery (i.e., bottom trawl gear).

5.4.3.1 Sea Turtles

Bottom Trawl Gear
Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso and Epperly 2006; NMFS NEFSC observer/sea sampling database; NMFS 2021a). 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 37°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 39°N, during July to October in waters less than 50 meters deep. Within each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

Based on Murray (2020)[5], from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI=0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. On Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

5.4.3.2 Atlantic Sturgeon

Bottom Trawl Gear
Atlantic sturgeon are at risk of interacting with bottom trawl gear (ASMFC 2017; Boucher and Curti 2023; Miller and Shepard (2011); NMFS (2021a); NMFS observer data). The NEFSC Observer Program have observed Atlantic sturgeon bycaught in Federal commercial bottom trawl fisheries since 1989, with recent bottom trawl bycatch estimates provided by Boucher and Curti (2023). Both environmental (e.g., depth, seasonal temperature) and operational fishing practices can affect the risk of Atlantic sturgeon being bycaught in bottom trawl gear (NMFS 2021a). For instance, the highest incidence of Atlantic sturgeon bycatch in otter trawl fisheries have been associated with depths less than 30 meters (ASMFC 2007; ASMFC 2017).

5.4.3.3 Atlantic Salmon

Bottom Trawl Gear
Atlantic salmon are at risk of interacting with bottom trawl gear (Kocik et al. 2014; NMFS 2021a; NEFSC observer/sea sampling database, unpublished data). Northeast Fisheries Observer Program (NEFOP) data from 1989-2022 show a total of 15 observed salmon incidentally bycaught, nearly half of which (seven) occurred in 1992 (NMFS NEFSC observer/sea sampling database, unpublished data).[6] The incidental takes of Atlantic salmon occurred in bottom otter trawls (4) and gillnets (11). Given the very low number of observed Atlantic salmon bottom trawl gear, interactions with this gear type are believed to be rare in the GAR.

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[5] Murray (2020) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2008; Murray 2015; Warden 2011a,b), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be similar to those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007, Murray and Orphanides 2013, Orphanides 2010).

[6] 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.

5.4.3.4 Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl 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 bottom trawl fisheries (Northeast or Mid-Atlantic) as Category II fisheries.

5.4.3.4.1 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 2012-2021, there has been one confirmed entanglement case between a humpback whale and a full trawl net; prior to 2012, minke whales were the only large whale species with documented interactions with bottom trawl gear.[7] 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 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.

5.4.3.4.2 Small Cetaceans and Pinnipeds

Bottom Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with bottom trawl gear.[8] Reviewing marine mammal stock assessment and serious injury reports that cover the most recent ten years of data (i.e., 2011-2020), as well as the MMPA LOF's, Table 13 has a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA LOF Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the small-mesh multispecies fishery. Of the species in Table 13, short-beaked common dolphins, Risso's dolphins, Atlantic white-sided dolphins, and gray seals are the most frequently observed bycaught marine mammal species in bottom trawl gear in the GAR, followed by long-finned pilot whales, bottlenose dolphin (offshore), harbor porpoise, harbor seals, and harp seals (Chavez-Rosales et al. 2017; Lyssikatos 2015; Lyssikatos et al. 2020; 2021).

Table 13. Small cetacean and pinniped species observed seriously injured and/or killed by Category II bottom trawl fisheries operating in the affected environment of the small-mesh multispecies fishery.

Fishery	Category	Species Incidentally Injured/Killed
Northeast Bottom Trawl	II	Harp seal
		Harbor seal

[7] 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)

[8] More information on small cetacean and pinniped interactions is in: NMFS NEFSC marine mammal serious injury and mortality Reference Documents, Publications, or Technical Memoranda; NMFS Marine Mammal SARs for the Atlantic Region; MMPA LOF.

Fishery	Category	Species Incidentally Injured/Killed
		Gray seal
		Long-finned pilot whales
		Short-beaked common dolphin
		Atlantic white-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Bottlenose dolphin (offshore)
		Gray seal
		Harbor seal
Source: NMFS Marine Mammal SARs for the Atlantic Region; MMPA 2017-2024 LOFs.		

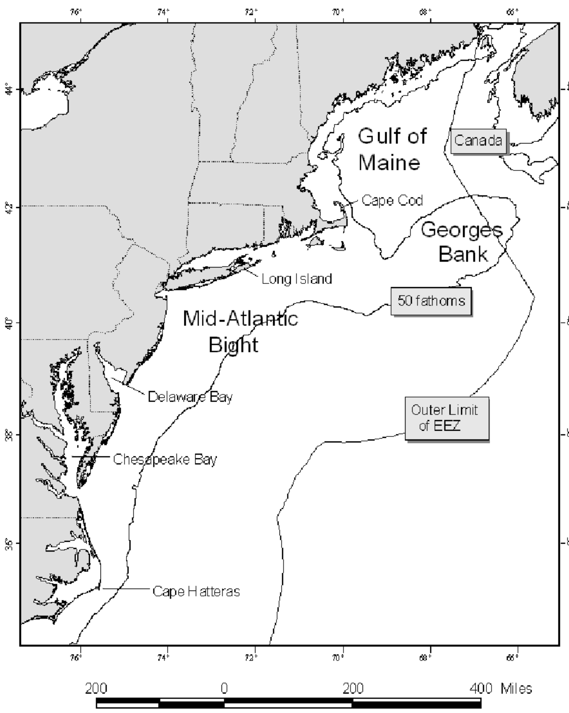
Due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid- Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy was implemented; for additional information on the measures provided in the Strategy, refer to NMFS Atlantic Trawl Gear Take Reduction Strategy.

5.5 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

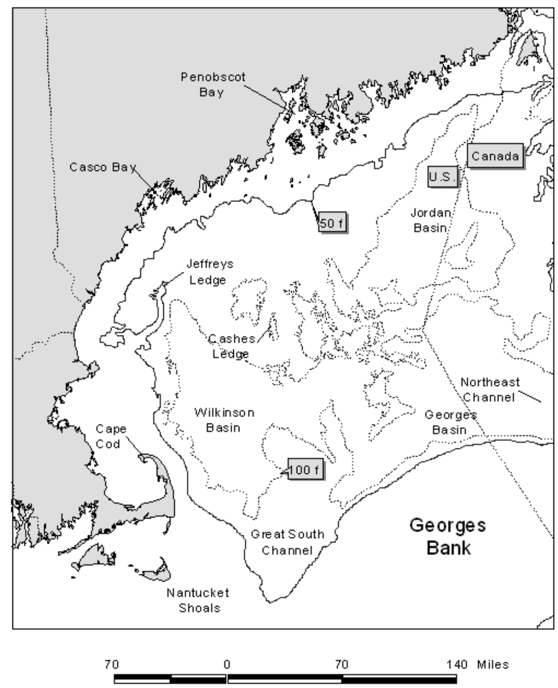
5.5.1 Physical Environment

The small-mesh multispecies fishery is prosecuted in the coastal waters out to the Continental Shelf edge in the Gulf of Maine, Georges Bank, and the Mid-Atlantic Bight (including Southern New England). A brief summary of the physical characteristics of these areas (Map 6) is given below, but more detail is available in Section 5.5 of the Framework 62 EA (NEFMC 2021b).

Map 6. Northeast U.S. Continental Shelf Large Marine Ecosystem



Map 7. Gulf of Maine



Gulf of Maine

The Gulf of Maine (GOM) is bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank. The GOM was glacially derived, and is characterized by a system of deep basins, moraines, and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes that result in a rich biological community.

The GOM is topographically unlike any other part of the continental border along the U.S. Atlantic coast. The GOM's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. It has twenty-one distinct basins separated by ridges, banks, and swells. The three largest basins are Wilkinson, Georges, and Jordan. Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. The Northeast Channel between Georges Bank and Browns Bank leads into Georges Basin and is one of the primary avenues for exchange of water between the GOM and the North Atlantic Ocean.

High points within the Gulf include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface, as well as lower flat-topped banks and gentle swells. Some of these rises are remnants of the sedimentary shelf that was left after most of it was removed by the glaciers. Others are glacial moraines and a few, like Cashes Ledge, are outcroppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the GOM, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. Some shallower basins are covered with mud as well, including some in coastal waters. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, as on Sewell Ridge to the north of Georges Basin and on Truxton Swell to the south of Jordan Basin. Sand predominates on some high areas and gravel, sometimes with boulders, predominates on others.

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the GOM north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20 - 40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western GOM, but are more common south of Casco Bay, especially offshore of sandy beaches.

Georges Bank

Georges Bank is a shallow (3 - 150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf that was formed by the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. 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 will likely reduce the amount of sand available to the sand sheets and cause an overall coarsening of the bottom sediments (Valentine & Lough 1991).

Glacial retreat during the late Pleistocene deposited the bottom sediments currently observed on the eastern section of Georges Bank, and the sediments have been continuously reworked and redistributed by the action of rising sea level, and by tidal, storm and other currents. The strong, erosive currents affect the character of the biological community. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor 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 the Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/h, and as high as 7 km/h. The dunes migrate at variable rates, and the ridges may also move. In an area that lies between the central part and Northeast Peak, Almeida et al. (2000) identified high-energy areas as between 35 - 65 m deep, where sand is transported daily by tidal currents, and a low-energy area at depths > 65 m that is affected only by storm currents.

The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. Nantucket Shoals is similar in nature to the central region of the Bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of traveling dune and swale morphology is also found in the Mid-Atlantic Bight, and further described below. 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 (Valentine, pers. comm.).

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. Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

Shelf and slope waters of the Mid-Atlantic Bight have a slow southwestward flow that is occasionally interrupted by warm core rings or meanders from the Gulf Stream. On average, shelf water moves parallel to bathymetry isobars at speeds of 5 - 10 cm/s at the surface and 2 cm/s or less at the bottom. Storm events can cause much more energetic variations in flow. Tidal currents on the inner shelf have a higher flow rate of 20 cm/s that increases to 100 cm/s near inlets.

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 - 200 m water depth and deeper) at the shelf break. In both the Mid-Atlantic and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself. The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales. Most of these structures are relic except for some sand ridges and smaller sand-formed features. Shelf valleys and slope canyons were formed by rivers of glacier outwash that deposited sediments on the outer shelf edge as they entered the ocean. Most valleys cut about 10 m into the shelf, except for the Hudson Shelf Valley that is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island. Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

Some sand ridges are more modern in origin than the shelf's glaciated morphology. Their formation is not well understood; however, they appear to develop from the sediments that erode from the shore face. They maintain their shape, so it is assumed that they are in equilibrium with modern current and storm regimes. They are usually grouped, with heights of about 10 m, lengths of 10 - 50 km and spacing of 2 km. Ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. The seaward face usually has the steepest slope. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Swales occur between sand ridges. Since ridges are higher than the adjacent swales, they are exposed to more energy from water currents, and experience more sediment mobility than swales. Ridges tend to contain less fine sand, silt and clay while relatively sheltered swales contain more of the finer particles. Swales have greater benthic macrofaunal density, species richness and biomass, due in part to the increased abundance of detrital food and the physically less rigorous conditions.

Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3 - 5 m with heights of 0.5 - 1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50 - 100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf, and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1 - 150 cm and heights of a few centimeters.

Sediments are uniformly distributed over the shelf in this region. A sheet of sand and gravel varying in thickness from 0 - 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf but is common in the Hudson Shelf Valley.

One notable feature is the mud patch located just southwest of Nantucket Shoals and southeast of Long Island and Rhode Island. Tidal currents in this area slow substantially, which allows silts and clays to settle out. The mud is mixed with sand and is occasionally resuspended by large storms. This habitat is an anomaly of the outer continental shelf. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the "mud line," and sediments are 70 - 100% fines on the slope. On the slope, silty sand, silt, and clay predominate.

Artificial reefs are another important Mid-Atlantic habitat, formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle & Zetlin 2000). While some materials have been deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. It is expected that the increase in these materials has had an impact on living marine resources and fisheries, but these effects are not well known. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations or may be behaviorally attracted to the reef structure.

5.5.2 Essential Fish Habitat

An update to the EFH Amendment, Omnibus EFH Amendment 2 (OHA2, NEFMC 2016), was approved by the Council in June 2015. OHA2 revised EFH designations for all the species managed by the Council, assessed fishing and non-fishing impacts for all the gears used in NEFMC-managed fisheries, and updated management measures to conserve EFH. The new EFH designations and management measures were implemented in April 2018. The Council began a review of its EFH designations in 2023; a timeline for a fishery management action or actions to update these designations has not yet been established. Hake EFH includes both inshore and offshore areas, typically with soft sediments and some sort of structure such as biogenic depressions or sand waves. Depending on the life stage, hakes may occur on the seabed, or in the water column. The new EFH maps for silver and red hake are based on state and NEFSC trawl survey data through 2005 and data inventories for fourteen estuaries, with juvenile distributions used as a proxy for the egg and larval life stages. Offshore hake EFH for eggs and larvae are based on egg and larval survey data, and the combined juvenile and adult designation map includes areas with high catch rates in the trawl survey. Hake EFH designations also include the continental slope to a depth of 400 m (juvenile and adult silver hake) or 750 m (adult red hake, juvenile and adult offshore hake), beyond the depth covered by the trawl survey.

The area that may potentially be affected by the preferred alternative has been identified as EFH for various species that are managed under the Fishery Management Plans for Northeast Multispecies; Atlantic Sea Scallop; Monkfish; Deep-Sea Red Crab[9]; Northeast Skate Complex; Atlantic Herring; Summer Flounder, Scup, and Black Sea Bass; Tilefish; Atlantic Mackerel, Squid, and Butterfish; Bluefish; Spiny Dogfish; and Atlantic Surfclam and Ocean Quahog. EFH for many of the species managed under these FMPs includes a wide variety of benthic habitats in state and federal waters throughout the Northeast U.S. Shelf Ecosystem. For more information on the geographic area, depth, and EFH description for each applicable life stage of these species, the reader is referred to OHA2 for New England-managed species, and various Mid-Atlantic FMPs for summer flounder/scup/black sea bass, tilefish, mackerel/squid/butterfish, spiny dogfish, and clams.[10]

[9] The OHA2 designations for red crab have a minimum depth of 320 m, such that red crab EFH is outside the depths typically targeted by the whiting fishery.

[10] Summer Flounder, Scup, and Black Seabass Amendment 12 (MAFMC 1998a), Golden Tilefish Amendment 1 (MAFMC 2008), Atlantic Mackerel, Squid and Butterfish Amendment 11 (MAFMC 2011), Atlantic Surfclam and Ocean Quahog Amendment 12 (MAFMC 1998b), Spiny Dogfish Amendment 3 (MAFMC 2014); Bluefish Amendment 1 (MAFMC 1998c).

5.5.3 Gear Impacts from the Small-Mesh Multispecies Fishery

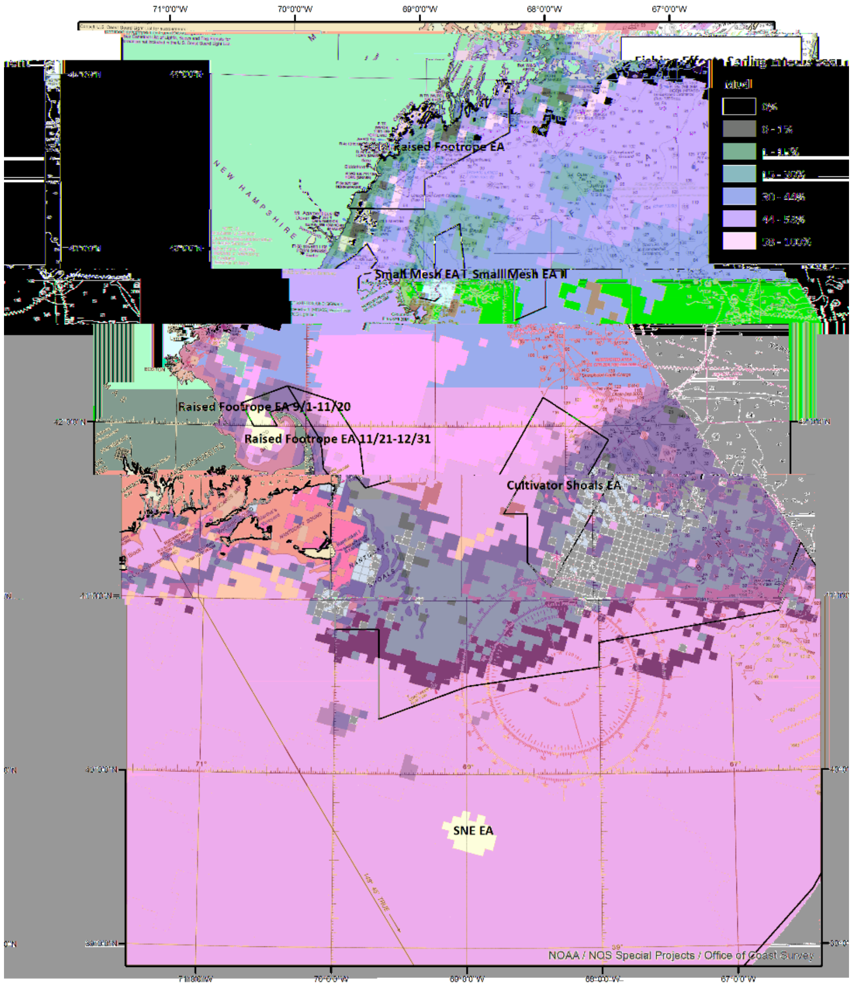
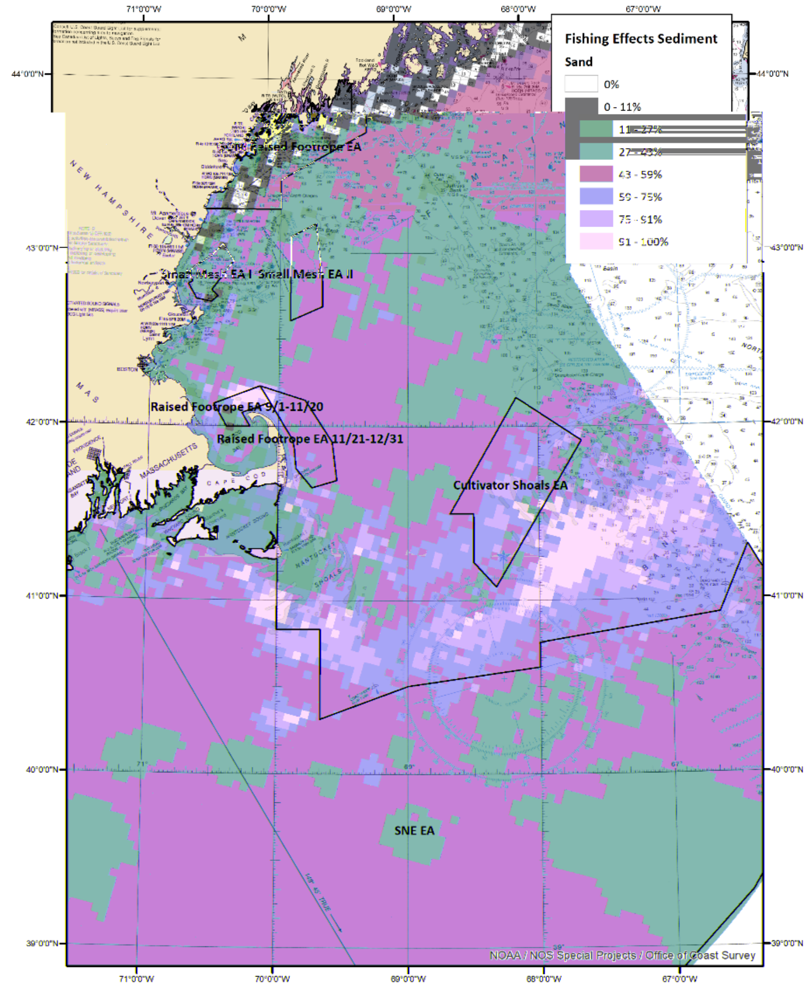
The small-mesh multispecies fishery is primarily a trawl fishery. Omnibus EFH Amendment 2 (OHA2, NEFMC 2017) and previous Council actions have found that bottom trawls can cause adverse, i.e., more than minimal and not temporary, impacts to EFH.

The Swept Area Seabed Impact (SASI) approach was the primary framework used in OHA2 to evaluate the impacts of fishing on the physical and biological environment (NEFMC 2011). SASI combined a literature-based vulnerability assessment with a spatially explicit modeling framework that linked fishing effort data with seabed habitat distributions and vulnerability indices. The SASI model estimated the distribution of the adverse effects of fishing on EFH in space and time. The Northeast Fishing Effects Model (NEFMC 2020c) is currently used by the Council as the basis for adverse effects determinations. Fishing Effects is built largely on the SASI approach, with some revisions to the modeling methods and additional recent fishing effort and seabed data. Habitat type in both SASI and Fishing Effects is a combination of substrate grain size, degree of natural disturbance, and the biological and geological seabed features likely to occur at a location.

With minor modifications, the SASI vulnerability assessment (published as Grabowski et al. 2014) continues to serve as the foundation for Fishing Effects. The vulnerability assessment found that there are differences between habitat types in terms of their relative vulnerability to gear impacts. Aggregating across the suite of seabed features present in each habitat type, soft bottom, high-energy habitats are estimated to be less vulnerable to the effects of fishing gear (see Figure 2 in Grabowski et al. 2014). The estimated effects of different gear types on seabed features are detailed in Tables 8 through 18 in the Fishing Effects report (NEFMC 2020c). This habitat- and gear-specific vulnerability, combined with the magnitude of fishing effort, influences the habitat disturbance occurring at a particular location over time. Model inputs and results can be viewed on the Northeast Ocean Data Portal, under 'Fishing Effects – Sediment' and 'Fishing Effects – Seabed Habitat Disturbance'.

The small-mesh multispecies fishery is not the only one to rely on bottom trawl gears. Thus, the adverse effects associated with the small-mesh fishery are a subset of those estimated for bottom trawl gear in aggregate. The small-mesh multispecies fishery is spatially and seasonally restricted seven exemption areas and year-round in the Southern New England and Mid-Atlantic regulated mesh areas (Map 8). Many of these exemption areas are dominated by sand or mud habitats which are less vulnerable to fishing gears. Exceptions are the Gulf of Maine Raised Footrope Exemption Area, which includes areas of gravel and rock habitat, and the eastern edge of the Cultivator Shoals Exemption Area, which has sand/gravel habitats. In addition, all but the Cultivator Shoals Area and the Southern New England and Mid-Atlantic regulated mesh areas require a raised footrope trawl, which reduces contact of that portion of the gear with the seabed, thus reducing impacts somewhat as compared to other trawl configurations. In combination, these two factors mitigate to some extent the adverse effects of the small-mesh fishery on EFH.

Map 8. Fishing effects sediment classification within and surrounding small-mesh exemption areas. Mud, sand, pebble, cobble, boulder, and deep/rocky) sum to 1 for each grid cell.

Percent mud	Percent sand
	

5.6 Human Communities

Section 5.6 of the Framework 62 EA (NEFMC 2021b) provides a detailed description of trends in price, revenue, permitting, and community participation and dependence. Updated information on landings, price, revenue, and permitting were published in the SAFE Report for fishing years 2020-2022 (NEFMC 2023). Brief summaries of these analyses are provided here, but for more detailed information the above documents should be consulted.

5.6.1 Commercial Whiting Fishery

Silver Hake

In FY 2022, 30% of northern silver hake catches occurred on uncategorized trips, 20% occurred on whiting trips, and about 18% were caught on groundfish trips. Almost all of the uncategorized and whiting fishery catch was landings while a majority of the groundfish fishery catch was discards. Squid and squid/whiting trips were the fourth highest group, catching about 16% of northern silver hake catch, almost all landings.

Discard rates for silver hake are lower than those for red hake, presumably because of more market demand and better tolerance of shipping and handling. Discards of northern silver hake have been variable in recent years, reaching an 11-year low in 2019 (132 mt) before rising to a high of 693 mt in 2021 (Figure 2). Discards were 389 mt in 2022 (Table 14). From FY 2012-2022, discard rates ranged from 7% to 25%. Much of this variability in discards appears to be related to market demand. The estimated discard rate for 2022 was 13.6% while state landings were 1% of total catch.

About 68% of the southern whiting catches were from squid and squid/whiting trips, with squid trips predominating. Roughly 75% of the squid trip catch was from landings while almost all of the squid/whiting trip catch was from landings. The next two groups were uncategorized and whiting trips at 16% and 10% of total whiting catch, respectively, mostly from landings.

From FY 2021 to 2022, southern whiting estimated discards increased from 497 to 609 mt, making up 19% and 22%, respectively, of total catch. Southern whiting discards from FY 2012-2022 fluctuated up and down but have recently declined from an 11-year high of 1,892 mt in 2019 to 609 mt in 2022. Discard rates varied from 9% to 33% across FY 2012-2022, and were, on average, higher than northern silver hake discard rates. The estimated discard rate for 2022 was 22% and state landings comprised 0.4% of total catch.

Table 14. Fishing year 2022 whiting (silver and offshore hake) landings and discards by stock area.

Northern Silver Hake	Pounds	Metric Tons	Percent of ACL (19,387 mt)	Percent of total catch
Commercial Landings	5,374,012	2,437	12.6%	85.3%
State-permitted only vessel landings	70,282	32	0%	1%
Research landings outside of Magnuson	5	0	0%	0%
Estimated discards	857,399	389	2.0%	13.6%
Catch*	6,300,698	2,858	14.7%	100.0%
Recreational catch (MRIP)	41,888	19	0.1%	0.7%
Southern Whiting	**Pounds**	**Metric tons**	**Percent of ACL (38,941 mt)**	**Percent of total catch**
Commercial Landings	4,734,542	2,148	5.5%	77.6%
State-permitted only vessel landings	26,076	12	0.0%	0.4%
Research landings outside of Magnuson	10	0	0.0%	0.0%
Estimated discards	1,342,526	609	1.6%	22.0%
Catch*	6,103,154	2,768	7.1%	100.0%
Recreational catch (MRIP)	-	0	0.0%	0.0%

* Total catch does not include recreational catch as the Annual Catch Limit does not include recreational catch.
MRIP Total Harvest during FY22 as of August 2023.
Data accessed September 5, 2023 from the CAMS database

Greater Atlantic Regional Fisheries Office
September 5, 2023

Red Hake

In FY 2022, around 40% of estimated northern red hake catches were from lobster trips, and roughly 30% were from groundfish trips. The lobster fishery catches were all discards, while groundfish catches were almost 90% discards. Whiting trips accounted for 7.4% of catch, almost all landings, followed by scallop and uncategorized trips with about 6.5% northern red hake catch each, all discards. Just over 35% of southern red hake was caught on scallop trips, all discards, and about 33% was caught on squid and squid/whiting trips. About 80% of the squid fishery catch was discards, but 68% of the squid/whiting catch was landings.

Red hake is part of the Bycatch Reduction Program (http://www.squidtrawlnetwork.com/red-hake-latest-high-avoidan/) which is a Cornell Cooperative Extension Marine Program funded by NOAA Fisheries and National Fish and Wildlife Foundation designed to develop innovative solutions to reduce bycatch through bycatch reduction devices and modifications to gear.

Th discard rates for northern and southern red hake have generally increased over time from FY 2012-2022, though there were fluctuations from year to year across the time series. From FY 2021 to 2022, northern red hake discards decreased from 97% to 88% and for southern red hake, discards decreased from 84% to 79% (Figure 5). In FY 2022, discards accounted for 446 mt of northern red hake and 421 mt of southern red hake. Most of this bycatch is associated with the small-mesh fishery that targets whiting and squid, and the scallop fishery. The discard rate for 2022 was 87.5% for northern red hake and 78.9% for southern red hake (Table 15). State-water landings comprised 1% and 0.6% of total catch, respectively.

Table 15. Fishing year 2022 red hake landings and discards by stock area.

Northern Red Hake	Pounds	Metric Tons	Percent of ACL (19,387 mt)	Percent of total catch
Commercial Landings	134,903	61	1.9%	12.0%
State-permitted only vessel landings	5,852	3	0%	1%
Research landings outside of Magnuson	234	0	0%	0%
Estimated discards	983,464	446	13.6%	87.5%
Catch*	1,124,453	510	15.6%	100.0%
Recreational catch (MRIP)	66,139	30	0.9%	5.9%
Southern Red Hake	**Pounds**	**Metric tons**	**Percent of ACL (38,941 mt)**	**Percent of total catch**
Commercial Landings	241,179	109	7.7%	20.5%
State-permitted only vessel landings	6,639	3	0.2%	0.6%
Research landings outside of Magnuson	372	0	0.0%	0.0%
Estimated discards	928,373	421	29.5%	78.9%
Catch*	1,176,563	534	37.3%	100.0%
Recreational catch (MRIP)	110,231	50	3.5%	9.4%

* Total catch does not include recreational catch as the Annual Catch Limit does not include recreational catch.
MRIP Total Harvest during FY22 as of August 2023.
Data accessed September 5, 2023 from the CAMS database

Greater Atlantic Regional Fisheries Office
September 5, 2023

5.6.1.1 Commercial Small-Mesh Multispecies Permits and Vessels

Vessels fishing for small-mesh multispecies in an exemption program must possess either an open access (Category K) or limited access (Categories A-F) NE multispecies permit. Small-mesh multispecies fishermen hold a range of other federal permits. A K-permit or groundfish permit (A-F) is required to land small-mesh multispecies.

From 2012-2022, the number of vessels that landed one or more pounds of small-mesh multispecies (i.e., anyone (or combination) of silver hake, offshore hake or red hake) ranged between 255 and 357. The number of boats engaged in small-mesh multispecies landings is on the decline, with its lowest level in 2022 (see Table 19 in NEFMC 2023). On average between 2012-2022, there were approximately 268 vessels that landed whiting and 177 vessels that landed red hakes[11]. In 2022, there were 222 vessels (with 4,488 trips) that landed whiting and approximately 132 vessels (with 2,101 trips) that landed red hake[12]. The number of trips landing small-mesh species in 2022 was substantially lower compared to 2021, 29% lower for whiting and 30% lower for red hake (See Table 20 and Appendix I Table 1 in NEFMC 2023).

[11] Landed ≥1 pounds of whiting or red hake.
[12] These vessels are not mutually exclusive and there may be an overlap on the effort (vessels or trips). A vessel or permit may have landed one or both these species. The same is true on trips whether directed or non-directed trips.

5.6.1.2 Landings, Revenues, and Prices

Table 16 summarizes the commercial fishery characteristics for the small-mesh multispecies fishery during fishing years 2012 to 2022.

Landings. Small-mesh multispecies landings consist of whiting (silver and offshore hakes) and red hake, the majority being silver hake.

> **Whiting landings.** Whiting landings have been declining since 2014. Annual total landings averaged about 9.80 million pounds over the past three years (2020-2022). Total landings in 2022 were 9.45 million pounds compared to 10.75 million and 9.18 million pounds in 2020 and 2021, respectively. The 2022 landings increased by about three percent from the previous year, and are slightly higher compared to the lowest landings during 2012-2021 (See Table 20 and Figure 9 in NEFMC 2023).
>
> **Red hake landings.** Average annual red hake landings were approximately 0.48 million pounds during 2020-2023. Total landings were about 0.67 million and 0.45 million pounds in 2020 and 2021, respectively. In 2022, landings declined to 0.32 million pounds (i.e., it is lowest during 2012-2022) compared to previous years (See Figure 10 and Appendix I Table 1 in NEFMC 2023).

Revenues. SMS revenues (in 2022 dollars) were $11.44 million and $10.76 million in 2020 and 2021, respectively. The revenue in 2022 was about $10.56 million, which is marginally lower than the 2021 level (Table 16). The 2020-2022 average revenues (in 2022 dollars) for whiting and red hake were $10.46 million and $0.28 million, respectively. Revenues for whiting and red hake have decreased in 2022 compared to 2021 levels, i.e., $10.76 million in 2021 versus $10.58 million in 2022 (See Appendix I Table 1 in NEFMC 2023).

Prices. In 2022, real prices for whiting and red hake were $1.06 and $0.74 per pound (in 2022 dollars), respectively. In 2022, the real price for whiting decreased by about 2.75% and the red hake price increased by about 30% compared to 2021 (See Table 23 in NEFMC 2023).

Figure 7. Landings, revenues, and prices for whiting and red hakes on landings ≥1 pounds, 2012-2022.

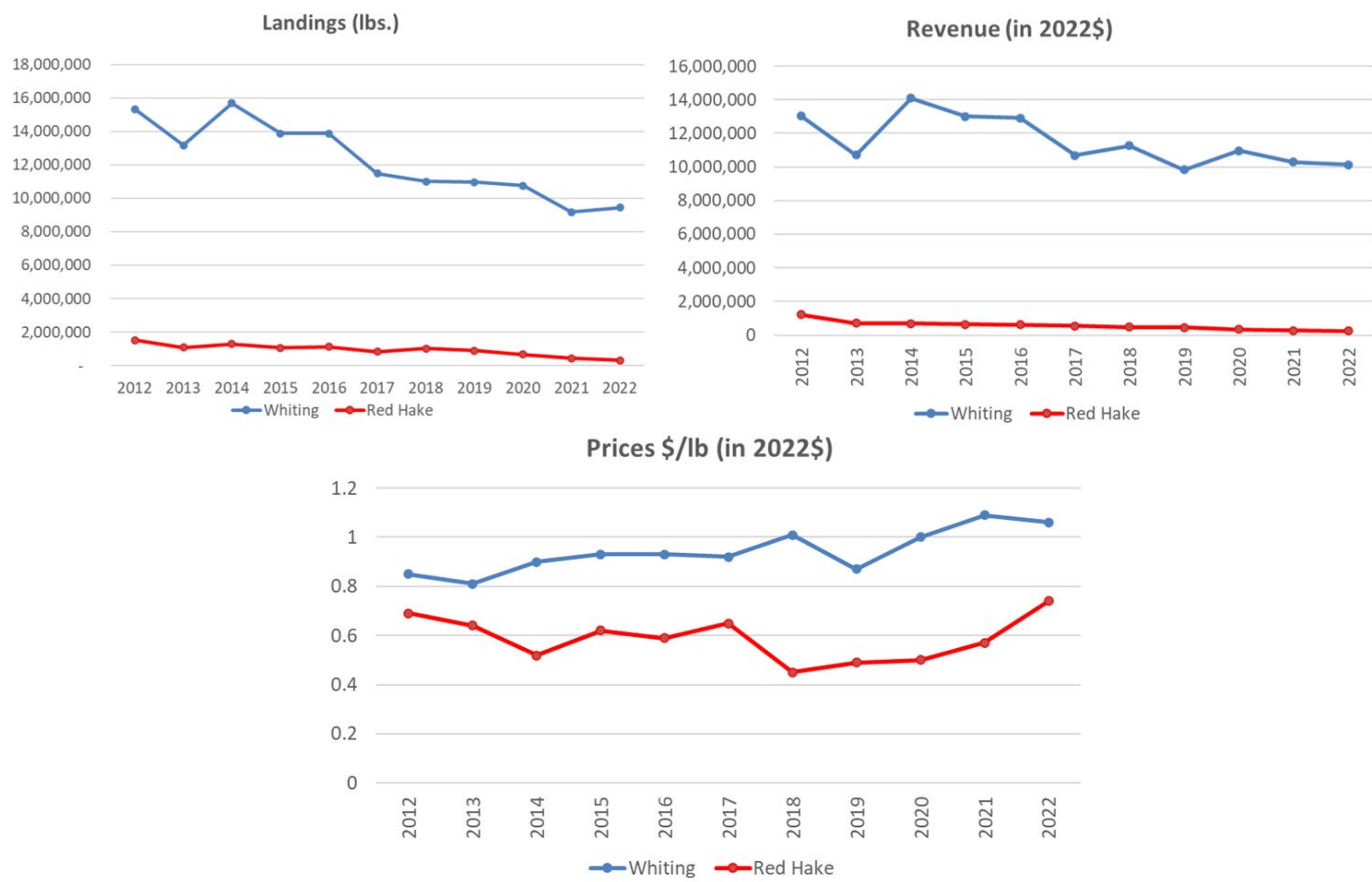


Table 16. Small-mesh multispecies effort, landings, revenue, and price by species and management area for vessels landing at least 1 lb. of small-mesh multispecies, 2012-2022.

		Whiting		Red hake	
Calendar Year	**Variables**	**North**	**South**	**North**	**South**
2012	No. of trips	5,294	5,281	540	4,540
	No. of boats*	177	214	57	220
	Landing lbs.	3,533,050	11,764,718	201,414	1,326,292
	Revenue $	2,211,959	8,089,801	64,784	907,113
	Revenue22$	2,860,402	10,461,343	83,759	1,172,969
	Price/lb N$	$0.63	$0.69	$0.32	$0.68
	Price22 R$	$0.81	$0.89	$0.42	$0.88
2013	No. of trips	4,005	5,535	457	4,675
	No. of boats*	172	209	47	222
	Landing lbs.	2,899,085	10,274,853	234,793	852,623
	Revenue $	1,890,719	6,757,653	63,103	524,740
	Revenue22$	2,408,516	8,608,430	80,373	668,389
	Price/lb N$	$0.65	$0.66	$0.27	$0.62
	Price22 R$	$0.83	$0.84	$0.34	$0.78
2014	No. of trips	4,316	4,640	445	4,452
	No. of boats*	162	208	44	226
	Landing lbs.	5,232,444	10,366,273	143,483	1,136,719

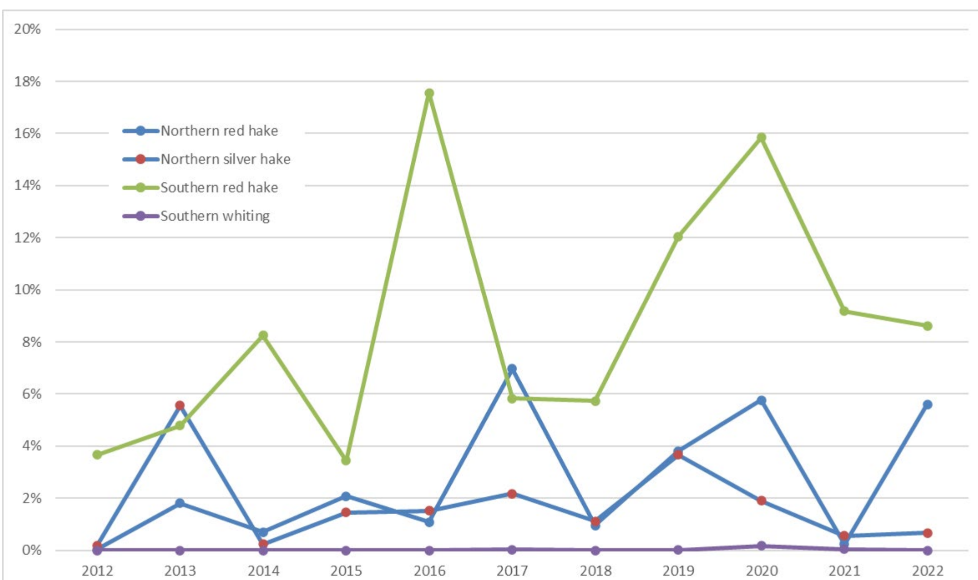
		Whiting		Red hake	
Calendar Year	Variables	North	South	North	South
	Revenue $	3,533,760	7,787,815	54,525	517,917
	Revenue22$	4,471,980	9,855,550	69,019	655,415
	Price/lb N$	$0.68	$0.75	$0.38	$0.46
	Price22 R$	$0.85	$0.95	$0.48	$0.58
2015	No. of trips	3,401	4,391	475	3,776
	No. of boats*	160	191	42	192
	Landing lbs.	4,507,826	9,352,677	211,244	851,366
	Revenue $	3,630,759	6,826,005	67,452	451,264
	Revenue22$	4,565,889	8,584,073	84,839	567,531
	Price/lb N$	$0.81	$0.73	$0.32	$0.53
	Price22 R$	$1.01	$0.92	$0.40	$0.67
2016	No. of trips	3,012	4,390	514	3,931
	No. of boats*	143	206	42	201
	Landing lbs.	6,605,878	7,273,688	324,208	791,002
	Revenue $	4,583,593	6,060,741	84,972	442,973
	Revenue22$	5,620,503	7,431,774	104,192	542,979
	Price/lb N$	$0.69	$0.83	$0.26	$0.56
	Price22 R$	$0.85	$1.02	$0.32	$0.69
2017	No. of trips	3,169	5,069	467	4,372
	No. of boats*	154	205	38	212
	Landing lbs.	5,827,037	5,637,418	168,658	656,568
	Revenue $	4,544,710	4,417,770	78,472	383,418
	Revenue22$	5,483,413	5,330,142	94,687	462,392
	Price/lb N$	$0.78	$0.78	$0.47	$0.58
	Price22 R$	$0.94	$0.95	$0.56	$0.70
2018	No. of trips	2,946	5,770	413	4,911
	No. of boats*	136	202	36	210
	Landing lbs.	4,457,303	6,538,329	221,483	800,995
	Revenue $	3,878,024	5,708,517	94,612	319,631
	Revenue22$	4,587,150	6,752,366	111,900	377,891
	Price/lb N$	$0.87	$0.87	$0.43	$0.40
	Price22 R$	$1.03	$1.03	$0.51	$0.47
2019	No. of trips	2,622	6,969	304	5,008
	No. of boats*	131	199	27	201
	Landing lbs.	2,642,869	8,327,360	237,951	666,086
	Revenue $	2,190,075	6,427,513	113,671	300,172
	Revenue22$	2,531,782	7,430,526	131,406	346,774
	Price/lb N$	$0.83	$0.77	$0.48	$0.45
	Price22 R$	$0.96	$0.89	$0.55	$0.52
2020	No. of trips	2,272	6,347	380	4,332
	No. of boats*	120	184	21	180
	Landing lbs.	2,730,889	8,018,369	109,659	565,482
	Revenue $	2,812,563	6,895,141	74,850	238,806
	Revenue22$	3,209,201	7,867,521	85,400	272,439
	Price/lb N$	$1.03	$0.86	$0.68	$0.42
	Price22 R$	$1.18	$0.98	$0.78	$0.48
2021	No. of trips	2,682	5,513	619	3,781
	No. of boats*	118	173	38	167
	Landing lbs.	4,262,994	4,905,540	87,267	359,581
	Revenue $	4,703,430	5,120,370	54,917	213,682
	Revenue22$	5,006,255	5,450,033	58,438	227,285
	Price/lb N$	$1.10	$1.04	$0.63	$0.59
	Price22 R$	$1.17	$1.11	$0.67	$0.63
2022	No. of trips	2,274	3,687	690	2,431

		Whiting		Red hake	
Calendar Year	Variables	North	South	North	South
	No. of boats*	118	168	43	149
	Landing lbs.	5,249,424	3,882,018	128,243	189,813
	Revenue $	5,643,567	4,275,197	95,749	174,826
	Revenue22$	5,643,567	4,275,197	95,749	174,826
	Price/lb N$	$1.08	$1.10	$0.75	$0.92
	Price22 R$	$1.08	$1.10	$0.75	$0.92
Note: * No. of boats by management area are not unique since same boat may be operating in different zones. However, no. of trips or other variables are.					

5.6.2 Recreational Catch and Other Landings

Recreational catch of silver hake is generally a small fraction of total catch (Figure 8), showing very little trend over time. Recreational catch of red hake is generally higher than silver hake and is highest in the southern management area. Recreational catch is not well estimated for the northern stock but is well estimated on a fishing year basis for the southern stock. Though there is a slight trend of increasing recreational catch of both red hake stocks, recreational catch of southern red hake has been decreasing since 2020, while northern red hake catch dipped in 2021 and bounced back to just under 6% of total catch in 2022. Southern red hake catch by recreational fishermen (8.6% of total catch) and by commercial vessels fishing in state waters (0.5% of total catch), generally within 3 miles of shore, has been minor portion of the total catch but the recreational catch estimates have increased (Figure 8).

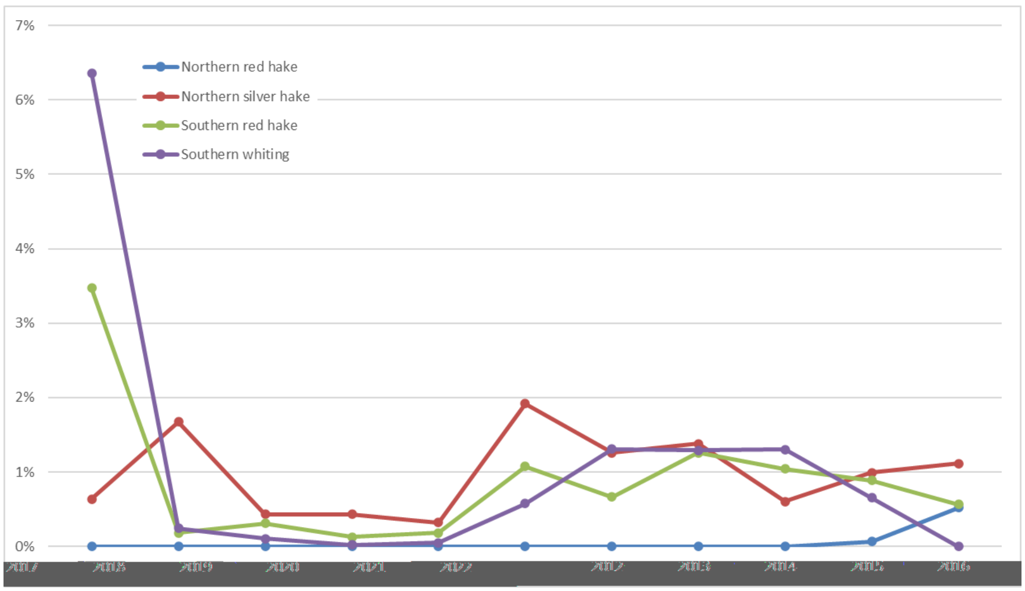
Figure 8. Recreational harvest estimates as a percent of total catch estimated from all sources, 2012-2022. Harvest (A+B1) for all years is estimated using Marine Recreational Information Program (MRIP) sources and programs assigned to small-mesh multispecies stock areas based on state and port where MRIP interviews occurred.



Recreational fishing aboard party boats targets southern red hake and whiting in parts of the Mid-Atlantic region, but the catches from this fishery are relatively low in the past 20 or so years due to changes in distribution and availability. Some party boats in Southern New England and the Gulf of Maine catch and land silver hake when they target other species. Charter fishing does not target small-mesh multispecies, but these boats and other that commercially target bluefin tuna rely on catches of whiting and red hake for bait. Some boats receive small-mesh multispecies catch from commercial trawlers at sea through an allowance to the small-mesh multispecies possession limits. These catches must be reported on VTRs by the catching vessel. Other boats targeting bluefin tuna use small gillnets to catch small-mesh multispecies for bait, requiring a permit and catch reports. Recreational fishermen that target bluefin tuna, cod, and other piscivorous species recognize the importance of silver hake in the ecosystem as a source of forage for species that these boats target.

State-permitted only vessel landings account for minor northern silver hake and southern whiting landings, 1 and 0.4%, respectively (Table 14) relative to total whiting catch in FY 2022, while northern and southern red hake landings by state-permitted only vessels account for 1% and 0.6% of total catch, respectively (Table 15).

Figure 9. Reported landings by vessels with only state permits of small-mesh multispecies stocks as a percent of estimated total catch by fishing year.



5.6.3 Fishing Communities

Consideration of the economic and social impacts on fishing communities from proposed fishery regulations is required under the National Environmental Policy Act (NEPA) and the Magnuson-Stevens Fishery Conservation and Management Act, particularly, National Standard 8 which defines a "fishing community" as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community".

National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. "Sustained participation" is interpreted as continued access to the fishery within the constraints of the condition of the resource.

5.6.3.1 Small-Mesh Multispecies Fishery

There have been over 238 port communities that have been a homeport or landing port to one or more active small-mesh multispecies vessels since 1996. These ports primarily occur from Maine to New Jersey. The level of activity in the small-mesh multispecies fishery has varied over time. This section identifies the communities for which whiting and red hake are particularly important. Clay et al. (2007) has a detailed profile of each port, including important social and demographic information. While these data describe a community's dependence on the small-mesh multispecies fishery, it is important to remember that at least some of the individual vessels therein are even more dependent on the fishery. In some cases, groups of communities identified below have been disaggregated so that information specific to certain communities can be provided and so that important details about individual communities are not lost.

Fishing Community Criteria. There are 14 small-mesh multispecies fishing communities that meet at least one of the following criteria:

- Cumulative whiting and red hake landings of at least 5M pounds (2,300 mt) between 1996-2016, or
- Whiting and red hake landings of at least 200,000 pounds (91 mt) annually from 2020-2022.

These criteria were chosen for analysis in draft Amendment 22, an action that proposed implementing limited access in the small-mesh multispecies fishery (NEFMC 2018a). Ports meeting these criteria were considered the most potentially impacted by the proposed Amendment 22 alternatives which could have affected the most active vessels and ports. Because the alternatives for this specifications document also affect the most active small-mesh multispecies vessels and the ports landing the majority of small-mesh multispecies, these same criteria are appropriate for this action as well. The second criteria was updated to include years 2020-2022 to account for more recent activity in fishing communities. All communities that qualified for the second criteria also met the first criteria.

There were 14 ports from Maine to New Jersey that had cumulative whiting and red hake landings of at least 5 million pounds from 1996 to 2016. Average annual small-mesh multispecies landings in these communities ranged from 252,632-6,015,072 lbs, with an average annual value of $89k to $2.42 million. Point Judith, RI had the highest average annual small-mesh landings, averaging 6.02 million lbs during this time. The percent of small-mesh multispecies landings varied from 0% to 45%, with the percent targeted trips ranging from 6-95% in the various communities.

Five ports landed at least 200,000 lbs of small-mesh multispecies annually from 2020 to 2022: Gloucester and New Bedford, MA; Point Judith, RI; New London, CT; and Montauk, NY (Table 18). New Bedford, MA had the highest landings, with 10.96 million lbs of small-mesh species landed, followed closely by Point Judith, RI, with 10.28 million lbs landed. New London, CT has the lowest small-mesh landings with just 866,640 lbs and only 128 vessels, but small-mesh multispecies make up 12.2% of landings revenue, far exceeding the other communities which range from 0.9-6.2% of landings revenue derived from small-mesh multispecies. All five communities also had medium-high to high engagement in the small-mesh multispecies fishery from 2020-2022 (Table 19). These five ports also had the highest average volumes of landings from 1996-2016 (Table 17), indicating continued participation in the small-mesh multispecies fishery.

Additional details on historic trends in the small-mesh multispecies fishery are available in Section 5.6.3 of the Framework 62 EA (NEFMC 2021b).

Table 17. Ports exceeding 5 million lbs of small-mesh multispecies landings between 1996-2016.

State	Port	Average Annual Small-mesh multispecies lbs	Average annual SMS value ($)	Percent landings from small-mesh species[1]	Percent targeted trips[2]
ME	Portland	252,632	89,211	0%	31%
MA	Gloucester	1,508,902	823,453	2%	19%
	New Bedford	4,014,022	2,148,748	1%	74%
	Provincetown	597,686	311,644	12%	90%
RI	Newport	336,584	103,939	3%	6%
	Point Judith	6,015,072	2,415,446	11%	13%
CT	New London	2,122,116	1,183,148	31%	67%
	Other New London[3]	313,997	121,763	25%	95%
	Stonington	834,071	407,817	8%	21%
NY	Greenport	927,748	376,061	45%	58%
	Hampton Bays	1,414,212	729,245	15%	24%
	Montauk	3,131,506	2,027,608	22%	44%
NJ	Belford	299,817	164,916	4%	22%
	Point Pleasant	593,836	250,005	0%	28%

Source: Accessed 10/2023 from GARFO CAMS database.
[1] Percent of total landings derived from small-mesh species.
[2] Percent of trips where revenue from whiting exceeded 50% of total revenue for the trip.
[3] "Other New London" includes the following communities within New London County, CT: East Lyme, Groton, Lyme, Montville, Mystic, Niantic, Noank, Norwich, Old Lyme, Waterford.

Table 18. Ports exceeding an average of 200,000 lbs of small-mesh landings annually, FY 2020-2022.

State	Port	Dealer	Vessels	SMS landings (lbs)	SMS value ($)	SMS targeted trips[1]	Percent landings revenue from small-mesh species
MA	Gloucester	116	808	4,312,494	3,957,674	696	2.2%
	New Bedford	116	1,019	10,959,370	13,223,651	767	0.9%
RI	Point Judith	109	775	10,281,191	7,077,914	1,401	3.7%
CT	New London	30	43	866,640	811,397	128	12.2%
NY	Montauk	74	404	3,115,291	3,377,982	499	6.2%

Source: Accessed 10/2023 from GARFO CAMS database.
[1]Targeted trips are defined as trips landing ≥2,000 lbs whiting and/or ≥400 lbs red hake.

The commercial fishing engagement index uses, for a given fishery, the number of permits landing in a port, the number of active fish dealers, the number of vessels with a permit for the fishery homeported in the port, and landings to measure the presence of commercial fishing in a community (NESFC 2023a). Higher rankings indicate more engagement in the fishery. Despite declining trends in landings and revenues (Figure 7), most of the small-mesh multispecies fishing communities as defined by the criteria in this document have remained at medium to high levels of engagement in recent years (Table 19).

Table 19. Engagement in the small-mesh multispecies fishery by community, 2020-2022.

State	Community	Engagement Ranking		
		2020	2021	2022
ME	Portland	Medium	Med-High	Med-High
MA	Gloucester	High	High	High
	New Bedford	High	High	High
	Provincetown	Medium	Med-High	Medium
RI	Newport	n.d.	n.d.	Medium
	Narragansett/Point Judith	High	High	High
CT	New London	High	High	Med-High
	Other New London	n.d.	n.d.	n.d.
	Stonington/Mystic/Pawcatuck	High	Med-High	Med-High
NY	Greenport	n.d.	n.d.	Low
	Hampton Bays/Shinnecock	High	High	High
	Montauk	High	High	High
NJ	Belford	Medium	Medium	Medium
	Point Pleasant	n.d.	n.d.	n.d.

Source: NOAA Fisheries Performance Measures, Small-Mesh Multispecies; NEFSC
Note: n.d. = no data. An engagement ranking was not available as of July 2024.

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

The Social Vulnerability Indicators. There are five social vulnerability indicators (Table 20): Labor force structure, Housing characteristics, Personal disruption, Poverty, and Population composition. The variables used to construct each of these indices have been identified in the literature as representing different factors that may contribute to a community's vulnerability. The **Labor force structure** index characterizes the strength/weakness and stability/instability of the labor force. The **Housing characteristics** index is a measure of infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards. The **Personal disruption** index represents factors that disrupt a community member's ability to respond to change because of personal circumstances affecting family life such as unemployment or educational level. The **Poverty** index is a commonly used indicator of vulnerable populations. The **Population composition** index shows the presence of populations who are traditionally considered more vulnerable due to circumstances often associated with low incomes and fewer resources. A high rank in any of these indicates a more vulnerable population.

Overall, the majority of small-mesh multispecies communities exhibited medium to high vulnerability in at least one of the five social vulnerability indicators. New Bedford, MA and New London, CT scored medium-high to high on four out of five indicators, while most other communities scored medium to high on one or two indicators. Four out of 14 communities scored low for all social vulnerability indicators. Data was not available for "other New London" as it includes several distinct towns.

Gentrification Pressure Indicators. Gentrification pressure indicators (Table 21) characterize factors that, over time, may indicate a threat to the viability of a commercial or recreational working waterfront, including the displacement of fishing and fishing-related infrastructure. The **Housing Disruption** index represents factors that indicate a fluctuating housing market where some fishing infrastructure displacement may occur due to rising home values and rents. The **Retiree migration** index characterizes areas with a higher concentration of retirees and elderly people in the population. The **Urban sprawl** index describes areas with increasing population and higher costs of living. A high rank in any of these indicates a population more vulnerable to gentrification.

Most small-mesh fishing communities scored medium to high on at least one of the three gentrification pressure indicators, with 11 out of 14 ports scoring medium to high on at least two of three indicators. Data was not available for "other New London". Housing disruption was the most common indicator, with 11 out of 14 communities scoring medium to high. This suggests that shoreside fishing infrastructure and fishing family homes may face rising property values (and taxes) from an influx of second homes and businesses catering to those new residents, which may displace the working waterfront.

Combined Social and Gentrification Pressure Vulnerabilities. Overall, all small-mesh multispecies communities have medium to high levels of vulnerability for two or more of the eight indicators (combined social and gentrification pressure; Table 20, Table 21). New Bedford, MA, and Greenport, NY have five indicators at the medium to high level. Portland, ME, New London, CT, and Montauk, NY have medium to high vulnerability in four indicators, while the remainder of the communities experienced medium to high vulnerability in two to three indicators. This indicates some degree of social and gentrification pressure vulnerability overall for these communities.

Table 20. Social vulnerability in small-mesh multispecies ports, 2020.

State	Community	Labor Force Structure	Housing Characteristics	Personal Disruption	Poverty	Population Composition
ME	Portland	Low	Medium	Low	Medium	Low
MA	Gloucester	Low	Low	Low	Low	Low
	New Bedford	Low	Med-High	Med-High	Med-High	Med-High
	Provincetown	Low	Medium	Low	Low	Low
RI	Newport	Low	Low	Low	Med-High	Low
	Narragansett/Point Judith	Medium	Low	Low	Low	Low
CT	New London	Low	Med-High	Med-High	High	Med-High
	Other New London	n.d.	n.d.	n.d.	n.d.	n.d.
	Stonington/Mystic/ Pawcatuck	Low	Low	Low	Low	Low
NY	Greenport	Medium	Low	Low	Low	Medium
	Hampton Bays/Shinnecock	Low	Low	Low	Low	Medium
	Montauk	Med-High	Low	Low	Low	Low
NJ	Belford	Low	Low	Low	Low	Low
	Point Pleasant	Low	Low	Low	Low	Low

Source: NOAA Fisheries Community Social Vulnerability Indices.
Note: n.d. = no data. Social vulnerability data was not available for 2020 as of November 2023.

Table 21. Gentrification pressure in small-mesh multispecies ports, 2020.

State	Community	Housing Disruption	Retiree Migration	Urban Sprawl
ME	Portland	Medium	Low	Medium
MA	Gloucester	Medium	Low	Medium
	New Bedford	Low	Low	Med-High
	Provincetown	Med-High	Low	Medium
RI	Newport	High	Low	Medium
	Narragansett/Point Judith	Med-High	Medium	Low
CT	New London	Low	Low	Low
	Other New London	n.d.	n.d.	n.d.
	Stonington/Mystic/Pawcatuck	Medium	Medium	Low
NY	Greenport	High	Medium	Med-High
	Hampton Bays/Shinnecock	High	Low	Medium
	Montauk	High	Med-High	Med-High
NJ	Belford	High	Low	Medium
	Point Pleasant	Medium	Low	Medium

Source: NOAA Fisheries Community Social Vulnerability Indices.
Note: n.d. = no data. Gentrification pressure data was not available for 2020 as of November 2023.

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

The impacts of the alternatives under consideration are evaluated herein relative to the valued ecosystem components (VECs) described in the Affected Environment (Section 5.0) and to each other.

6.1 INTRODUCTION

This action evaluates the potential impacts using the criteria in Table 22.

Table 22. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).

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

6.1.1 Approach to Impacts Analysis

6.1.1.1 Impacts on target species and non-target species

Because stock assessments for red and silver hakes are empirical (i.e. not based on an analytical model), the Council is unable to estimate how catch specifications and other measures could affect future stock biomass and yield. In general, alternatives that are expected to increase catch would be expected to result in less biomass than for other alternatives associated with lower catch limits. Higher catch limits for stocks that are near or higher than B_{msy} improve the potential for the fishing industry to increase catches and achieve optimum yield, although external factors may limit the industry's ability to increase catch (see discussion below). Hence most of the following analyses are qualitative rather than precise and quantitative.

Except for southern red hake, whose catch exceeded the ACL in 2018 and 2019, small-mesh multispecies catches have been below (and in the case of northern silver hake and southern whiting, well below) previous specifications. More recently, southern red hake catches have declined to 93.7% of the 2020 ACL, 79.0% of the 2021 ACL, and 37.3% of the 2022 ACL (when rebuilding management measures became effective). Due to the actions below, this situation is unlikely to change unless there are unexpected changes in external factors. These factors include demand for whiting, fishing costs (fuel, labor, ice, etc.), prices for alternative target species, availability of alternative target species (herring, squid, etc.), and changes in regulations that restrict small-mesh fishing.

Prices for whiting have remained relatively low and have not been increasing compared to other goods and services (see Section 5.6.1). In fact, whiting prices generally declined in 2019 (NEFMC 2020b), unrelated to recent effects due to the Covid virus restrictions. Although small-mesh multispecies real prices have been increasing since in 2019 from $0.87/lb to $1.06/lb for whiting and from $0.49/lb to $0.74/lb for red hake; landings, total revenue, and vessel participation in the fishery have continued to decline (see Section 5.6.1 and NEFMC 2023).

There is no apparent reason that this demand will substantially change during the specification period to attract new fishing effort. Likewise, there is no reason to expect that fishing costs will substantially change in the specification period, relative to other goods and services.

Three alternative species compete for fishing time on many whiting fishery boats. Many of the whiting boats have limited access permits in these alternative fisheries, including large-mesh groundfish, herring, and loligo squid. Groundfish regulations are not expected to become substantially more restrictive than they are now, since many groundfish stocks are already subject to rebuilding programs. The 2024 squid specifications are expected to be about the same as in 2020-2022; thus, the 2024 quota level is not expected to change the among of squid fishing effort (J. Didden, pers. comm.) or cause an effort shift from or to the small-mesh multispecies fishery. Quotas for Atlantic herring, however, have been reduced due to declining stock biomass. Some vessels from the mid-water trawl fishery can be expected to adapt to the new reduced quotas and modify their gear and vessel to target whiting (or other species for which they have permits to catch). How many vessels would make a change from targeting herring to target whiting has not been estimated but appears to be limited by the vessel's configuration and fish hold characteristics.

Regulations to protect regulated groundfish stocks from capture by small-mesh trawls restrict fishing for whiting to specific areas and seasons (see Section 3.1.1). Climate change has affected the seasonal distribution of both regulated groundfish and whiting. Advisors report that whiting are arriving earlier in the spring in the northern management area exemptions, but the open season dates prevent vessels from targeting whiting early in the season. MA Division of Marine Fisheries conducted a two-season experimental fishery that evaluated the bycatch of groundfish before the season for Small-Mesh Area I opened. They found that the total groundfish catch was generally less than a 5% standard, but catches of small haddock were high and there was no a reduction in groundfish catch relative to whiting catch in an early season (Chosid et al. 2019). At the present time, the Council does not anticipate changing the area and season restrictions that apply to the whiting fishery. However, since the experimental fisheries were conducted, haddock bycatch in the small-mesh multispecies fishery has declined substantially (Section 5.3).

The Council proposed and NMFS approved an increase in the whiting possession limit for vessels using less than 3-inch mesh trawls. The measure was intended to reduce whiting bycatch by vessels targeting other species (e.g. squid and herring) while not incentivizing vessels to target whiting with smaller mesh than is customarily used to target small-mesh multispecies. It is too early to evaluate the effect on discard rates, but analysis of vessel trip report data for fishing year 2022 indicates that the measure has not increased targeting of small-mesh multispecies by vessels using the smaller mesh (see Section 5.6 in NEFMC 2023).

6.1.1.2 Impacts on Essential Fish Habitat

Impacts on EFH are primarily assessed based on the estimated relative effects of gears from the Swept Area Seabed Impact (SASI) model (NEFMC 2011). Trawls are the primary fishing gears used in the small-mesh multispecies and associated fisheries, which have differential impacts on the seabed depending on the trawl configuration. Vessels using raised footrope trawls in the small-mesh multispecies fishery appear to have somewhat less seabed impact overall due to the lower impact of the sweep in the raised footrope trawl, compared to the squid trawl (Table 23). The increased whiting possession limit for vessels using less than 3” mesh implemented in 2022 could potentially impact fishing effort by allowing vessels targeting other species to land more whiting, but it is too early to determine the effects of this action. It should also be noted that the raised footrope trawl is not required in the Cultivator Shoals Area or in the Southern New England and Mid-Atlantic regulated mesh areas, where small-mesh multispecies fishery trawls are more like the ‘Generic otter trawls’ shown in the table below.

Another associated fishery in the impacts analysis for this document is the herring mid-water trawl fishery, due to the potential for fishing effort to shift due to increasingly restrictive herring regulations to decreasingly restrictive small-mesh multispecies regulations. Relative seabed impacts from mid-water trawls were not, however, quantified in this study.

Table 23. Contact indices for trawl gear components.

Gear type	*Component*	*Contact index*
Generic otter trawl	Doors	1.00
Generic otter trawl	Ground cable	0.95
Generic otter trawl	Sweep	0.90
Squid trawl	Doors	1.00
Squid trawl	Ground cable	0.95
Squid trawl	Sweep	0.50
Shrimp trawl	Doors	1.00
Shrimp trawl	Ground cable	0.90
Shrimp trawl	Sweep	0.95
Raised footrope trawl	Doors	1.00
Raised footrope trawl	Ground cable	0.95
Raised footrope trawl	Sweep	0.05

6.1.1.3 Protected Species

Potential interaction risks between a fishery and protected species (ESA-listed and MMPA protected species) are largely determined by expected fishing behavior and effort. Specifically, the type of fishing gear, amount of gear in the water, gear soak or tow duration, and the area of overlap between fishing and protected species are strongly related with the potential for an interaction to occur. These factors, the information provided in Section 5.4, as well as expected fishing behavior and effort under each alternative are considered in the assessment of impacts to protected species provided in Section 6.4. In addition, the impacts analysis of the alternatives on protected species takes into account the impacts to ESA-listed species as well as non-ESA listed, MMPA protected species in good condition (i.e., marine mammal stocks whose PBR level has not been exceeded) or poor condition (i.e., marine mammal stocks that have exceeded or are near exceeding their PBR level).

6.2 Impacts on Target Species (Silver, Red, and Offshore Hakes)

6.2.1 Alternative 1 – No Action

As described in Section 8.1.2 of the Amendment 19 EIS (NEFMC 2012), the impacts of management actions on the silver, offshore and red hake stocks and the small-mesh multispecies fishery likely have been low positive by maintaining a stable silver and red hake population through implementing an Annual Catch Limit (ACL), in-season accountability measures (AMs) that reduce the possession limits to incidental levels when landings approach the TAL, and post-season AMs that reduce the TAL trigger to mitigate prior overages of the ACL. The EIS attributes these positive impacts to keeping catch within scientifically determined limits, particularly in combination with the proactive and reactive AMs, which would substantially curtail the fishery to incidental possession limits if landings were projected to reach the TAL and would pay back any overage the next year via changes to the TAL trigger.

Catches of northern silver hake and southern whiting have been well below catch specifications since 2012, when Amendment 19 was implemented, averaging 6 and 26 percent of the ACL, respectively. See Section 5.2.1 for more details about trends in silver hake and whiting catches and the history of ACL specifications.

Catches of northern red hake exceeded the ACL in 2012, 2013, and 2015, but the combination of the AMs and high recruitment have allowed the stock to recover, and in 2018-2019, the northern red hake catch averaged only 40% of the ACL. Catch declined further in fishing year 2022 to only 16% of the ACL. Biomass of southern red hake declined while catches (primarily discards in the whiting and squid fisheries) increased in 2018-2019. This resulted in triggering AMs in 2018 and 2019 and the stock was assessed as being overfished. Since then, catches have declined from 1165 mt to only 534 mt in fishing year 2022 (37% of the ACL). See Section 5.2.2 for more details about trends in red hake catches and the history of ACL specifications.

The No Action alternative would maintain the specifications at the same level analyzed in the 2021-2023 specifications document EA (Table 6). The small-mesh multispecies fishery performance has remained stable in the last 10 years since the specifications were implemented. Despite increases in biomass of silver hake and northern red hake, landings and revenue have declined in recent years, which is attributable to changes in market demand and restrictions placed on the fishery to minimize the catch of large-mesh groundfish. The Council does not expect substantial increases in landings or catch in the near future due to constraints on market demand and restrictive small-mesh multispecies fishery regulations. In all cases, the No Action specifications would not be constraining on catch (ACL) or landings (TAL) and increases in fishing effort, however possible, are not expected in the near term due to other constraining factors. These factors include limited market demand and competition with foreign imports, the need for specialized gear and fishing methods, on-board labor to process a large volume of fish, and exemption area restrictions meant to keep groundfish bycatch below acceptable levels.

Under No Action, the ACLs for northern silver hake and southern red hake are less than those recommended by the SSC to prevent overfishing and minimize the risk that they would become overfished. Therefore, No Action is expected to have positive impacts on these stocks.

No Action would have moderate negative impacts on the southern whiting stock if the catch at this limit causes overfishing, but actual catches have been well below the ACL and the stock is above the minimum biomass threshold. Thus, in the near term, the impacts on the southern whiting stock are negligible, but could become negative if catches increase and cause overfishing. Stock biomass has, however, declined in 2021-2022 compared to prior years (Section 5.2.1) and is currently assessed at a level between the MSY-proxy management target and the minimum biomass threshold that is associated with being overfished. If the fishery increases effort to land the No Action TAL, catches would be excessive and lead to stock biomass declining below the threshold, potentially causing the stock to become overfished. Thus, No Action would have a moderately negative impact on the southern whiting stock.

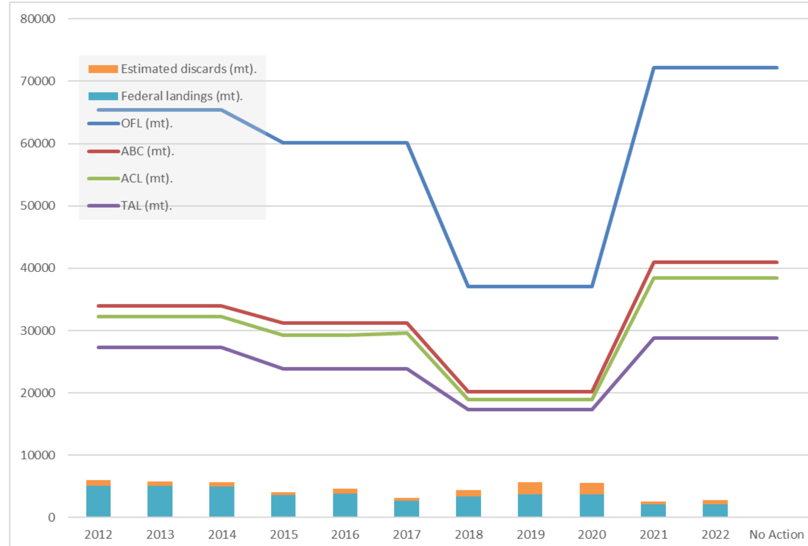
The northern red hake ACL for No Action would be 9% higher than that recommended by the SSC, but the stock biomass is well above the target and is the highest in the time series. Thus, a marginal increase in catch above the ACL is highly unlikely to cause the stock to become overfished. The impact of No Action on the northern red hake stock is therefore slightly positive.

Compared to Alternative 2, No Action has lower catch limits for northern silver hake and southern red hake stocks, but higher catch limits for southern whiting and northern red hake. Thus, compared to Alternative 2, No Action would have slightly positive impacts on northern silver hake and southern red hake stocks, and slightly negative impacts on southern whiting and northern red hake.

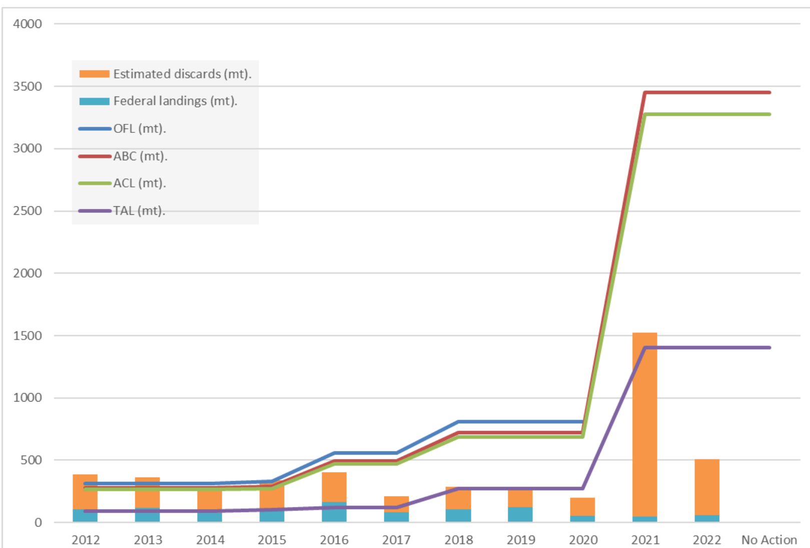
Figure 10. Comparison of No Action (Alternative 1) specification levels and estimated catch from 2012 to 2022.

Northern silver hake

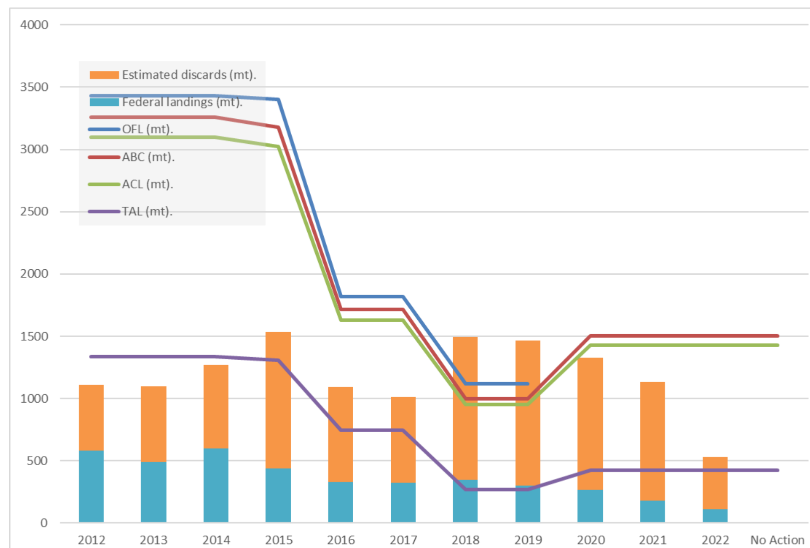
Southern whiting



Northern red hake



Southern red hake



6.2.2 Alternative 2 - 2024-2026 Specifications Adjustment (Preferred Alternative)

Overall, slight positive impacts are expected for all target stocks under Alternative 2 as the updated specifications will support a positive stock status (or rebuilding progress toward a positive status) for all species. Differences in impacts relative to no action vary by stock, as discussed below. As explained in Sections 6.2.2.1 and 6.2.2.2, there is a very slight difference between Options 1 and 2 in the risk of exceeding the ACL or causing overfishing. Both options have a slightly positive impact on northern red hake and southern red hake and a negligible impact on northern silver hake and southern whiting relative to No Action.

Northern silver hake and southern whiting

Stock biomass is estimated by a stratified, random survey conducted by NMFS. This biomass is based on the fall survey, deemed most representative of stock conditions by the last benchmark assessment (NMFS 2011). Biological reference points are based on the 1973-1982 averages, which were considered to be a suitable proxy for MSY.

During the September 2023 management track assessment, the stock biomass indices from the fall survey were updated for 2020-2022 for silver hake stocks. NMFS bottom trawl surveys were not conducted in the fall of 2020 and thus the average biomass was calculated as the average of the 2021 and 2022 mean weight per tow (kg/tow). The updated survey biomass indices result in a 99% increase in the northern silver hake OFL and a 48% reduction in the southern whiting OFL (Table 24).[13] Scientific uncertainty was re-estimated based on the sampling variance for the recent 3-year period and for the 1972-1983 reference period. Discard rates (percent of total catch) were also updated to the 2020-2022 period, to set the TAL.

The survey biomass for northern silver hake declined in 2017-2019 from a higher level in the recent years, then spiked in 2021 and 2022 to the highest amount in the time series (see Section 5.2.1). The survey biomass for northern silver hake has been increasing and is now well above the survey-based reference points and the relative exploitation rate is very low. Thus, the OFL, ABC, and specifications can increase by a commensurate amount without jeopardizing the stock and future sustainable yield. Furthermore, small-mesh multispecies fishing effort has been declining and there is no reason to expect large increases in silver hake catch because the catch limit increases. Increases in price have been moderate and there are no management changes in related fisheries to expect an effort shift into small-mesh multispecies fishing.

Conversely, southern silver hake biomass had been increasing recently, but declined in 2021 and 2022. Because exploitation has been very low, factors external to the fishery are more likely driving observed declines. Increases in water temperature may be contributing to changes in distribution and/or decreases in productivity (i.e. lower recruitment success and higher natural mortality). Biomass is currently above the minimum biomass threshold, but below the target level. Thus, although the fishery has not caught the annual catch limit and is unlikely to catch the revised catch limit for this alternative, the proposed reduction in OFL and ABC is consistent with a 49% decline in stock biomass. A lower limit will reduce the risk that southern silver hake could become overfished if catches increase.

Even if catch increases to the ACL, there is a very low probability that overfishing would occur or that the stocks would become overfished. For both stocks, the changes in the specifications are consistent with the recent changes in stock biomass and account for recent changes in scientific uncertainty, discards, and

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[13] A standard adjustment is made to the OFL to account for the mixed catch of offshore hake in the southern management area, averaging about 4% of the total catches.

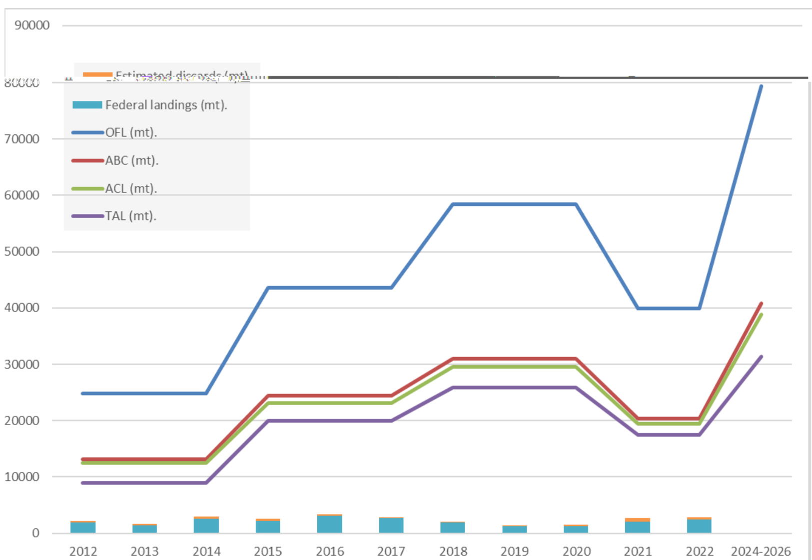
state water landings. Furthermore, the specifications account for scientific uncertainty by setting the ABC at the 25th percentile of the OFL. At this level, the estimated risk of overfishing if catch equals the ABC is less than one percent for both stocks.

Because northern silver hake and southern whiting catches have not exceeded the ACLs and are not projected to do so (see Figure 11), slight positive impacts to the northern silver hake and southern whiting stocks are expected.

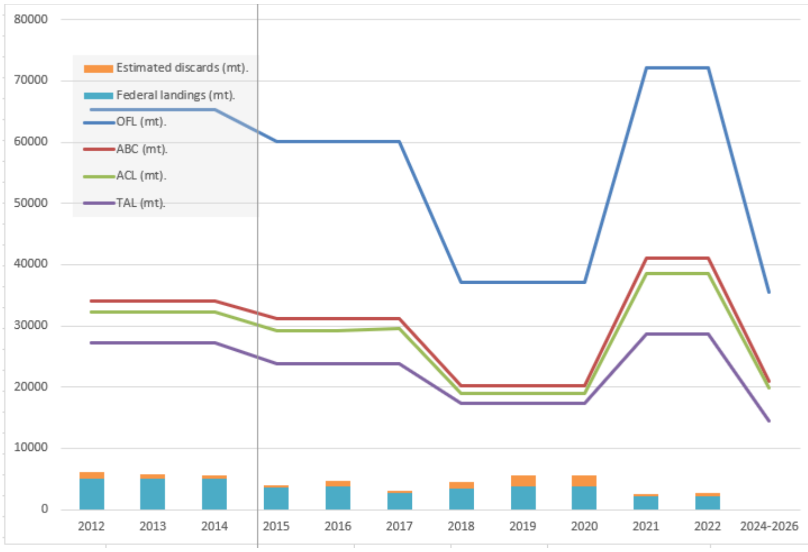
For northern silver hake, the proposed specifications are higher than those in the No Action alternative, but are not expected to cause the stock to become overfished. Thus, the expected impact of Alternative 2 on northern silver hake is slightly positive relative to No Action. The specifications for southern whiting are lower than those for the No Action alternative. Thus, with a lower exploitation rate, the impact to southern whiting is expected to be slightly positive relative to No Action.

Figure 11. Comparison of Alternative 2 specifications for northern silver hake and southern whiting in 2024-2026 and estimated catch from 2012 to 2022.

<u>Northern silver hake</u>



<u>Southern whiting</u>



Red hake

In 2020, red hake stocks were assessed using data through 2019 and previous biological reference points were rejected before setting specifications for fishing years 2021-2023. The SSC reviewed recommendations by the Council's Plan Development Team and agreed to set red hake specifications on the following basis for FY 2021-2023.

For the northern red hake stock, the Council's SSC recommended using the average exploitation rate during 1981-1994 (1.5%) to set the ABC. This was justified because the exploitation rate occurred during a period when the stock appears to have responded to management through higher biomass followed by a period of stability. The stock appeared to be in good condition and the SSC felt that recent exploitation of the stock at this level would not risk causing overfishing of the stock or cause it to become overfished. The management track assessment found that the very low exploitation rates were not a primary driver of changes in biomass. Thus, at this very low exploitation rate, the recommended 2021-2023 specifications were unlikely to cause the stock to become overfished.

The northern red hake stock was reassessed in September 2023 using the same method that was approved previously. Total biomass was estimated from the spring and fall bottom trawl surveys, which were adjusted to account for the efficiency of the trawl net. Exploitation was estimated by dividing estimated catch by the efficiency-adjusted total stock biomass. To set specifications according to the small-mesh multispecies ACL framework (Figure 1), the biomass from the spring 2021-2023 and fall 2020-2022 surveys (omitting the missing 2020 surveys) were averaged. Due to strong year classes (recruitment) since 2014, northern red hake biomass is the highest on record but the 3-year moving average is 9% lower than it was for 2017-2019 when the stock was last assessed. Thus, a decrease in the ABC and associated specifications is needed to make the catch limits commensurate with the updated perception of the stock condition. Estimated northern red hake discards increased, causing the TAL to decline by 85%. Catch and landings have historically been below the proposed levels (Figure 12) and are not expected to substantially increase.

The southern red hake stock was assessed in September 2023 using catch and survey data through 2022, with 2020 missing survey data omitted. Biomass is estimated to be near the lowest level in the time series and is considered to be overfished according to the Amendment 19 overfishing definition (NEFSC 2023b). However, the management track assessment of southern red hake considered the status to be unknown compared to an biomass benchmark associated with MSY (which was not estimated by the management track assessment or determined by the SSC) because there is no analytical assessment on which to forecast changes in stock biomass at various exploitation rates. The three-year moving average for biomass increased by 21% compared to the average for 2017-2019. Discards during 2020-2022 have risen compared to 2018-2020, leading to a decrease in the TAL by 26%.

For the southern red hake stock, the Council's SSC recommended using the average exploitation rate during 2001-2019 (3.1%) to set the ABC. This was justified because the exploitation rate that occurred during this period indicates that the stock may have been driven by factors external to fishing or management regimes because exploitation rates remained very low. The stock appears to be in a poor, but stable condition and the SSC felt that exploitation of the stock at recent levels would not risk causing overfishing of the stock or reducing its chance to rebuild. The consistently low exploitation rate throughout most of the assessment time series led the SSC to determine that "the low stock biomass may be a result of reduced stock productivity producing weak year classes" and that "the recommended ABC is unlikely to result in overfishing and will support rebuilding goals for this stock." (see SSC memo dated November 25, 2023.)

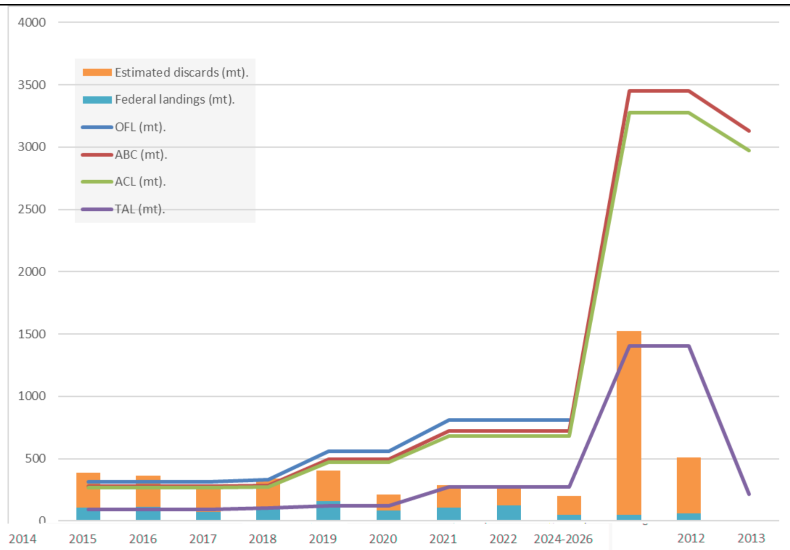
Because the northern red hake catches have not exceeded the ACLs and are even less likely to do so with the proposed specifications, the proposed specifications are expected to have a slightly positive impact on the stock. The decrease in the red hake specifications is the result of increasing stock biomass measured by the survey and from the maximum exploitation rate recommended by the SSC compared to recent low exploitation. It is unlikely that the low red hake exploitation rates would cause overfishing and would not cause the northern red hake stock to become overfished. Thus, Alternative 2 (with Option 1 or 2 for northern red hake) is expected to have a slightly positive impact on the northern red hake stock.

By itself, the low exploitation rate associated with the southern red hake ABC is also highly unlikely to cause a decline in biomass or inhibit rebuilding under Framework 62. The catch limits implemented through Alternative 2 are unlikely to cause a further decline in stock biomass below an overfished status, and could promote rebuilding in the long term. Thus, Alternative 2 is also expected to have a slightly positive impact on the southern red hake stock.

For northern red hake, the proposed specifications are lower than those in the No Action alternative. Thus, with a lower exploitation rate, the impact to northern red hake is expected to be slightly positive relative to No Action. The ABC specification for southern red hake is higher than the No Action alternative ABC but is not expected to cause a decline in biomass or impede rebuilding. Thus, the expected impact of Alternative 2 on southern red hake is slightly positive relative to No Action.

Figure 12. Comparison of Alternative 2 specifications for red hake stocks in 2024-2026 and estimated catch from 2012 to 2022.

<u>Northern red hake</u>



<u>Southern red hake</u>

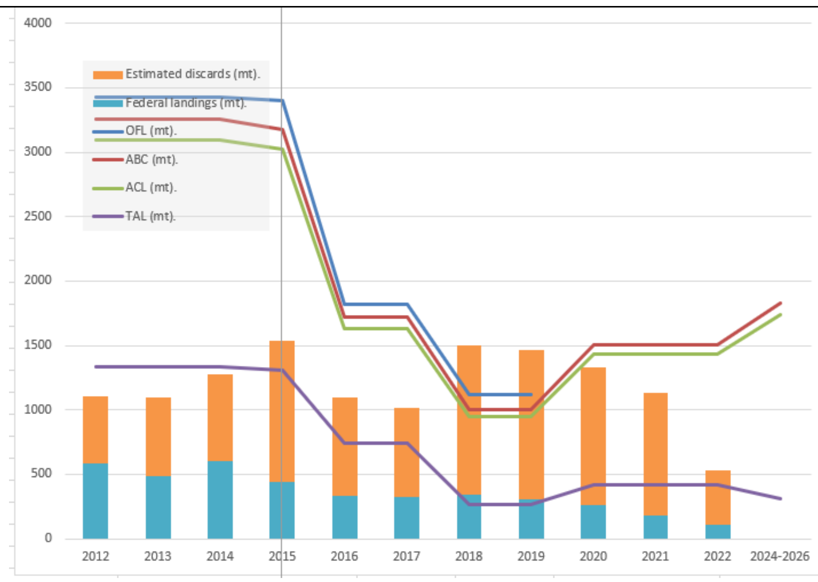


Table 24. Percent change in the potential specifications for small-mesh multispecies stocks relative to No Action (Section 4.1).

Stock	OFL (mt)	ABC (mt)	ACL (mt)	TAL (mt)	TAL trigger (mt)[14]
Northern silver hake	99%	100%	100%	80%	80%
Southern whiting	-51%	-51%	-51%	-52%	-52%
Northern red hake	N/A	-9%	-9%	-85%	-85%
Southern red hake	N/A	21%	21%	-26%	-26%

6.2.2.1 Northern red hake Total Allowable Landings (TAL) Option 1

The intended effect of a TAL limit is for quota monitoring, which can trigger a reduction in the possession limit to reduce the incentive to fish for a small-mesh multispecies, in this case northern red hake. It is intended to reduce the risk of catch exceeding the Annual Catch Limit (ACL) or exceeding the Overfishing Level (OFL) thus causing overfishing.[15] It should be noted that red hake are rarely the target species in the small-mesh multispecies fishery, but lower possession limits that are triggered by the quota can influence where fishing takes place to avoid catching red hake that would be discarded when the catch exceeds the lowered possession limit.

The proportions of state water landings and estimated discards as a proportion of total catch are summarized the table below. Applying these ratios for 2020-2022 and for 2017-2019 for northern red hake to determine the TAL specification result in the specification values for Option 1 and Option 2 (Table 26), respectively.

Northern red hake landings in 2019-2022 are summarized in Table 27 for comparison to the proposed TAL specifications. During this recent period, the maximum landings were 126 mt, 59% of the proposed TAL under Option 1. If landings continue at recent amounts, the in-season AM would not be triggered, having no impact on the stock or the fishery. However, a moderate increase in landings could cause landings to exceed the quota trigger and reduce the possession limit to only 400 lb. This measure would be very conservative but would prevent catch from exceeding the ACL and causing overfishing.

Table 25. State water landings and estimated discard proportions of 2020-2022 total catch, compared to the aggregate proportion for 2017-2019.

Stock	State landings	Discards, weighted	TAL/ACL ratio	
			2020-2022	2017-2019
Northern red hake	0%	93%	7%	43%
Northern silver hake	1%	18%	81%	90%
Southern red hake	1%	81%	18%	30%
Southern whiting	1%	27%	73%	74%

[14] The TAL trigger in this table reflects 2020 implementation, including the reduction in the southern red hake TAL trigger caused by overages in fishing year 2018.
[15] It is important to note that the OFL for red hake stocks is currently classified as “unknown”.

Table 26. Northern red hake specifications proposed by Alternative 1 (No Action) and Alternative 2, Options 1 and 2.

Alternative	ABC (mt)	ACL (mt)	TAL (mt)	TAL trigger (mt)
Alternative 1, No Action	3,452	3,278	1,405	1,265
Alternative 2, Option 1	3,129	2,973	213	192
Alternative 2, Option 2	3,129	2,973	1,274	1,147

Table 27. Northern red hake catch and landings by fishing year, FY 2019-2022.

Year	Catch (mt)	Landings (mt)
2019	138	126
2020	149	51
2021	1,474	48
2022	446	61

The impacts of Option 1 are described above in Section 6.2.2. Although it is unlikely to affect the amount of small-mesh multispecies fishing to target whiting, Option 1 would have a marginally lower risk than Option 2 of northern red hake catch exceeding the ACL. Thus, compared to Option 2, it would have a slightly positive effect on the target stock (red hake) and a negligible effect on silver hake. Compared to No Action, the measure in Option 1 would have the same effect as described above in Section 6.2.2 (slightly positive impacts on northern red hake).

6.2.2.2 Northern red hake Total Allowable Landings (TAL) Option 2 (Preferred)

The low TAL for Option 1 is derived by applying the average discard rate from the most recent three years (2020-2022), which typically would be expected to continue in the near future due to recent fishing activity. About half of total northern red hake discards in 2021 and 2022 resulted from only five trips where northern red hake discards were observed in the lobster trap fishery, which has a very low rate of observed trip sampling. In 2022, for example, there were 15 observed trips, 4 with northern red hake discards totaling 62.2 lb. These 15 trips landed 6,871 lb. of lobsters giving a discard rate of 0.0091. When the discard to kept ratio is multiplied by over 52 million lb. of lobster landings in the small-mesh multispecies northern management area, the total discards in the lobster trap fishery are 475,788 lb. of discarded red hake. The sample of 15 trips came from a total of nearly 115,000 trips.

Due to this uncertain discard estimate, Option 2 proposes to apply the 2017-2019 discard rate, which was similar to previous estimates, to derive the 2024-2026 northern red hake TAL (see Table 26). The TAL specification would be considerably higher than recent landings (Table 27) and give the opportunity for the fishery to land more northern red hake. The ACL specifications are much higher than the Option 2 TAL and there is a sufficient buffer to prevent catch from exceeding the ACL. Additional trip sampling would likely reflect more representative of discard estimates that have been typical in the past.

The impacts of Option 2 are described above in Section 6.2.2 (slightly positive), but with less potential for landings to exceed the quota and reduce the possession limit during the fishing year. Because red hake are rarely the target species due to their low price, it is unlikely to affect targeting of whiting.

There is a very slight difference between Options 1 and 2 in the risk of exceeding the ACL or causing overfishing. Thus, compared to Option 1, it would have a slightly negative effect on the target stock (red hake) and a negligible effect on silver hake. Compared to No Action, the measure in Option 2 would have the same effect as described above in Section 6.2.2, but the impact on northern red hake would be slightly positive because the TAL would be slightly less (-9%) than that for No Action.

6.3 Impacts on Non-Target Species

See Section 5.3 for a summary of trends in bycatch associated with trips targeting whiting and red hake in the small-mesh multispecies fishery.

There are several factors at work that are considered in the impact analysis below. One is that the Alternative 2 northern silver hake specification increases by 100% relative to status quo and the No Action alternative. Coincidentally, the Alternative 2 specifications for southern whiting and southern red hake decline. Despite this, we do not anticipate that large scale changes in the location and amount of fishing effort are expected, unless fish prices for the target silver hake and alternative target species prices and availability change. These alternative species include squid and Atlantic herring, whjch are also targeted by (sometimes the same) vessels using small-mesh trawls. At the same time, Alternative 2, Options 1 and 2 differ in the TAL for northern red hake, which may, under Option 1, trigger an in-season accountability measure and reduce the northern red hake possession limit to 400 lbs. If this occurs, some vessels may alter the location of where they fish to avoid catching large volumes of red hake. This effort shift by location, if it occurs, is likely to be relatively local, fishing less frequently in mud and mud/sand bottoms. Depending on the species and their co-occurrence with red hake, the impacts are expected to be small, either in a positive or negative direction.

6.3.1 Alternative 1 – No Action

Alternative 1 would retain current specifications and is not expected to cause small-mesh multispecies fishing effort to change substantially from recent years. Thus, No Action is expected to maintain the stock statuses of non-target species, and, therefore, is expected to have a slightly positive impact on non-target species that are not overfished and slightly negative impact to those that are overfished (Table 11). Some of the non-target species most frequently caught in the small-mesh multispecies fishery include spiny dogfish, butterfish, little skate, barndoor skate, and monkfish. None of these species are overfished. There are some non-target species caught in the small-mesh fishery that are overfished, including Atlantic herring and northern windowpane flounder.

Compared to Alternative 2 and its sub options, the No Action alternative is expected to have a negligible impact on non-target species because the amount of fishing effort is unlikely to change.

6.3.2 Alternative 2 - 2024-2026 Specifications Adjustment (Preferred Alternative)

Alternative 2 would increase the northern silver and red hake specifications but decrease the specifications for southern whiting and southern red hake. Because the fishery does not catch the ABC for the primary target stocks (northern silver hake and southern whiting), fishing effort is not expected to increase. The fishery is also subject to market demand, more lucrative alternative fisheries (e.g. squid), technical challenges for new entrants, with season and area restrictions.

Thus, Alternative 2 is expected to have a slightly positive impact on non-target species that are not overfished and a slight negative impact on overfished non-target species but a negligible impact relative to No Action. The highest ranking overfished stock (Table 11) is yellowtail flounder which is the 19th highest bycatch species in the small-mesh multispecies fishery (Table 10), averaging 35 mt per year from 2020-2022 (0.6% of estimated total discards, or 0.2% of small-mesh multispecies fishery landings on targeted trips). While the overall amount of fishing effort is not expected to change, implementing lower specifications for southern whiting, and northern red hake could cause fishermen reach small-mesh multispecies catch limits faster and relocating to target other species, such as northern silver hake. This could lead to positive impacts for non-target species that utilize the same habitats as southern whiting, and northern red hake, as there could be reduced fishing effort in the area. However, non-target species that coexist with northern silver hake may experience increased fishing pressure in the area, resulting in negative impacts. Though this is a possibility, TAL utilization rates for all four stocks have been low in recent years (Table 29), which may indicate that the fishery could remain fishing at similar levels without reaching ACL and therefore would be unlikely to target different species or shift effort.

Alternative 2 includes relatively large changes in specifications compared to No Action. The northern silver hake specifications increase by 100% and the southern whiting specifications decline by 51%. However, these changes in specifications are not expected to markedly change the amount or location of small-mesh multispecies fishing effort, because recent catches have been well below the Alternative 2 ACLs (see Section 5.2). Red hake catches, on the other hand, have exceeded the Alternative 2 ACLs in some years (Figure 12) but are rarely the target species. As such large changes in the amount and location of small-mesh multispecies fishing are also not expected to result. Some avoidance of red hake is however expected when the TAL is met, which is more likely than not for Alternative 2, Option 1. In this case, vessels avoiding red hake when the quota is met will have less impact on species that are commonly associated with red hake on sand and sand/mud bottoms and potentially a greater impact on species associated with hard sand and less muddy bottom when they target silver hake.

Compared to No Action (Alternative 1), Alternative 2 and its sub options are expected to have a negligible impact on non-target species because the amount of fishing effort is unlikely to change, and would therefore result in similar levels of non-target species mortality.

6.3.2.1 Northern red hake Total Allowable Landings (TAL) Option 1

Due to low price, red hake are rarely the target of small-mesh multispecies fishing. A lower TAL (than Option 2) is unlikely to change fishing effort but may change the location of small-mesh multispecies fishing to avoid catching large amounts of red hake. This may lower the bycatch of species that are associated with red hake, those that inhabit muddy or sand/mud bottoms such as cusk or white hake. Given the reduction in TAL, this scenario is more likely under Option 1 than Option 2.

Thus, the impacts of Option 1 would be slight negative to slight positive depending on the species, and slight negative to slight positive compared to Option 2. The impacts compared to No Action are as described in Section 6.3.2.

6.3.2.2 Northern red hake Total Allowable Landings (TAL) Option 2 (Preferred)

Due to low prices, red hake are rarely the target of small-mesh multispecies fishing. A higher TAL (than Option 1) is unlikely to change the amount fishing effort but may change the location of small-mesh multispecies fishing without regard for the amount of red hake caught (up to the 3,000 lb. possession limit). This may slightly increase the bycatch of species that are associated with red hake, those that inhabit muddy or sand/mud bottoms.

Thus, the impacts of Option 2 are expected to be slight negative to slight positive depending on the non-target species, and slight negative to slight positive compared to compared to Option 1.The impacts compared to No Action are as described in Section 6.3.2.

6.4 Impacts on Protected Species

Section 5.4 identifies numerous species under NMFS jurisdiction that are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972, that occur in the affected environment of the small-mesh multispecies fishery and have the potential to be impacted by the proposed action. This analysis evaluates how the small-mesh multispecies fishery could impact these protected species under each alternative for the proposed action. The general approach for evaluating impacts to protected species is described in Section 6.1.1.3.

There are several factors at work that we take into account in the impact analysis below. One is that the Alternative 2 northern silver hake specification increases by 100% relative to status quo and the No Action alternative. Coincidentally, the Alternative 2 specifications for southern whiting and southern red hake decline. Despite this, we do not anticipate that large scale changes in the location and amount of fishing effort are expected, unless fish prices for the target silver hake and alternative target species prices and availability change. These alternative species include squid and Atlantic herring, which are also targeted by (sometimes the same) vessels using small-mesh trawls. At the same time Alternative 2, Options 1 and 2 differ in the TAL for northern red hake, which may under Option 1 trigger an in-season accountability measure and reduce the northern red hake possession limit to 400 lbs. If this occurs, we predict that some vessels may alter the location of where they fish to avoid catching large volumes of red hake. This effort shift by location, if it occurs, is likely to be relatively local, fishing less frequently in mud and mud/sand bottoms.

Depending on the species and their co-occurrence with red hake, the impacts are expected to be small, either in a positive or negative direction. These protected species impacts are expected to be less than those for non-target species interactions, i.e., finfish that have a greater affinity for specific bottom habitat favored by red hake. Presence of protected species relative to the small-mesh multispecies, whether it is avoiding red hake or not, tends to be more variable and seasonal than for other species that co-occur with hakes and the impacts on protected species are thus more varied and less certain than the assessed impacts on other VECs in Section 6.

Table 28. Impacts of FY 2024-2026 specifications alternatives on protected resources.

	Alternative 1: No Action	Alternative 2: Option 1	Alternative 2: Option 2
ESA-listed species	Negligible to slight negative	Negligible to slight negative	Negligible to slight negative
Non-ESA listed species (MMPA protected)	negligible to slight positive *MMPA-protected stocks in poor condition:* Negligible impacts *MMPA-protected stocks in good condition:* slight positive impacts	Slight negative to slight positive *MMPA-protected stocks in poor condition:* Negligible to slight negative impacts *MMPA-protected stocks in good condition:* slight positive impacts	Slight negative to slight positive *MMPA-protected stocks in poor condition:* Negligible to slight negative impacts *MMPA-protected stocks in good condition:* slight positive impacts

6.4.1 Alternative 1 – No Action

This alternative would maintain the previously established specifications. As a result, fishing patterns would likely remain similar to present patterns (e.g., no spatial or temporal shifts in effort; no changes in gear type, quantity, or relative soak/tow time). Based on this information, fishing behavior and effort is anticipated to remain similar to current conditions, although some changes in small-mesh multispecies fishing may occur to avoid catching southern red hake due to limits established by Framework 62

(NEFMC 2021b). Information about how fishermen will respond to the new southern red hake limits is unclear.

Taking into consideration this and the information provided above, the impacts of the No Action alternative are provided below. These impacts stem from current levels of fishing opportunities for vessels and their fishing effort and behavior (e.g., gear quantity, gear soak/tow duration, area fished).

MMPA (Non-ESA Listed) Protected Species Impacts

The impacts of No Action on non-ESA-listed species of marine mammals are likely to range from negligible to slightly positive, depending on the species/stock. As provided in Section 5.4, some bottlenose dolphin stocks (i.e., WNA Northern and Southern Migratory Coastal Stocks) are experiencing levels of interactions that have resulted in exceedance of their PBR levels. These stocks/populations are not at an optimum sustainable level and therefore, the continued existence of these stocks/species is at risk. As a result, any potential for an interaction is a detriment to the species/stocks ability to recover from this condition. As provided in Section 5.4, marine mammal stock assessment and serious injury reports, as well as the MMPA LOFs indicate that there have been no observed or documented interactions between bottom trawl gear and WNA Northern or Southern Migratory Coastal Stocks of bottlenose dolphins. Based on this, and the fact that commercial fishing effort and behavior under No Action are expected to remain unchanged from current operating conditions, the No Action alternative is not expected to introduce new or elevated interaction risks to these non-ESA-listed marine mammal stocks in poor condition. Given this information, the No Action alternative is likely to result in negligible impacts to non-ESA-listed marine mammal stocks/species in poor condition (i.e., WNA Northern or Southern Migratory Coastal bottlenose dolphin stocks).

Alternatively, there are also many non-ESA-listed marine mammals that, even with continued fishery interactions, are maintaining an optimum sustainable level (i.e., PBR levels have not been exceeded) over the last several years. For these stocks/species, it appears that the fishery management measures that have been in place over this timeframe have resulted in levels of effort that result in interaction levels that are not expected to impair the stocks/species ability to remain at an optimum sustainable level. These fishery management measures, therefore, have resulted in indirect slightly positive impacts to these non-ESA-listed marine mammal species/stocks. Should future fishery management actions maintain similar operating condition as they have over the past several years, it is expected that these slightly positive impacts would remain. Fishing patterns under No Action will likely remain similar to the present. Therefore, the impacts of No Action on these non-ESA-listed species of marine mammals are expected to be slightly positive (i.e., continuation of current operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

ESA-Listed Species Impacts

Interactions between ESA-listed species and bottom trawl gear have been observed or documented (Section 5.4). Based on this, the current fishery is likely to result in some level of negative impacts to ESA-listed species. As stated above, the No Action alternative would maintain the previously established annual catch limits. As a result, fishing behavior (e.g., area fished) and/or effort (e.g., the amount of gear in the water (small-mesh otter trawl), tow duration,) are expected to be similar to those previously observed in the small-mesh fishery. Considering the information presented above and the fact that the potential risk of interacting with gear types used in small mesh multispecies fishery varies between ESA-listed species (e.g., listed species of large whales have never been documented/observed in bottom trawl gear), the No Action alternative is expected to have negligible to slightly negative impacts on ESA-listed species.

Overall Impacts to Protected Species

Based on the analysis presented above, No Action is expected to have slightly positive to slightly negative impacts on protected species (i.e., ESA-listed and MMPA protected), with negligible to slightly positive impacts expected for non-ESA-listed (i.e., MMPA protected) marine mammals, and negligible to slightly negative impacts expected for ESA-listed species.

Relative to Alternative 2, impacts to protected resources for No Action are likely to be negligible. This is due to the fact that fishing behavior and effort under Alternative 2 are likely to be the same as that under No Action.

6.4.2 Alternative 2 - 2024-2026 Specifications Adjustment (Preferred Alternative)

Changes in specifications relative to No Action are summarized in Table 24, which would increase the northern silver hake and southern red hake ABC specifications and decrease the ABC specifications for southern whiting and northern red hake stocks. Although specifications for two stocks would increase, the levels, type, and distribution of fishing activity in the small-mesh multispecies fishery is not expected to substantially change for reasons identified and discussed in Section 6.1.1, and because existing specifications have generally been non-constraining for the silver hake and whiting stocks, which are the primary target of the small-mesh multispecies fishery. Specifications for northern and southern red hake stocks have not been constraining since 2020 (and did not trigger in-season accountability measures) and they are not the primary target. Overall catch specifications have not been the limiting factor on effort, and would be less so for northern red hake in Alternative 2, Option 2 than they would be for Alternative 2, Option 1.

Some spatial shifts in fishing effort may be possible given the changes to specifications. Depending on the number of vessels that shift effort, interaction risks to protected species have the potential to increase or decrease relative to current operating conditions in the fishery. Should vessels shift effort to other parts of the management area in a manner that results in the increased co-occurrence of vessels and protected species, interaction risks could increase (e.g., more vessels in one area = more gear being towed in the area relative to what was fished prior to the shift). The same could also hold true that the any shift in effort away from areas of red or silver hake may result in vessels moving out of an area at a time when the co-occurrence of vessels and protected species are high. In turn, the shift in effort away from an area of high co-occurrence could help to reduce the potential for interactions.

It is possible that if annual catch limits for squid decline or whiting prices substantially increase, the small-mesh multispecies could see higher amounts of fishing effort (especially during squid trimester closures). Even if this increase in small-mesh multispecies fishing effort occurs, much of the new effort would shift from one fishery to the other using substantially similar gear during the same season.

Based on the fact that, relative to current operating conditions, large changes in fishing effort and behavior are not expected, Alternative 2's impacts to protected species (i.e. ESA-listed and MMPA protected) are expected to be slightly negative to slightly positive, similar to those provided in Alternative 1. Refer to section 6.4.1 for rationale to support this determination of impacts.

Small-mesh multispecies specifications have not constrained fishing effort since 2020, and substantial increases in effort are not expected under Alternative 2, which would otherwise allow for increased catch of northern silver hake and southern red hake. Though these ABCs would be higher under Alternative 2, substantial changes in the amount or location of fishing effort between the southern management area (Mid-Atlantic to southern Georges Bank) to the northern management area (northern Georges Bank and the Gulf of Maine) are not anticipated. Conversely, the ABCs for southern whiting and northern red hake stocks would decrease under Alternative 2: however, the updated specifications are not expected to be binding on current effort, catch, or landings of these stocks. Red hake are not a primary target in the fishery due to low market prices and poor holding characteristics, so changes to these specifications are unlikely to substantially alter fishing effort. Thus, relative to No Action, Alternative 2 is expected to have negligible impacts to protected species.

Overall, relative to No Action, impacts to protected resources for Alternative 2 are likely to be negligible. This is due to the fact that fishing behavior and effort under Alternative 2 are likely to be the same as that under No Action.

6.4.2.1 Northern red hake Total Allowable Landings (TAL) Option 1

As explained in Section 6.3.2.1, vessels may alter fishing locations by depth or bottom type to avoid catching and discarding northern red hake when the quota is reached. The northern red hake quota (or TAL) is considerably lower for Option 1 than it is for Option 2.

The northern area fishery (Georges Bank to the Gulf of Maine) is much more likely to trigger the TAL in-season accountability measure with Option 1 than it would under Option 2. If vessels try to avoid catching red hake when the quota is met, it could cause a slight shift in fishing effort within the northern management area (or even within specific small-mesh exemption areas) and have some effect on protected species depending on their location and the timing of a red hake closure.

In this case, there could be less effort in areas where red hake typically occur on mud or sand/mud bottoms and slightly more fishing elsewhere where silver hake occur. This shift and potential slight increase in effort in areas where red hake is absent could result in negligible to slight negative impacts to protected species. It is unlikely that vessels will shift to fishing in the southern management area because the red hake quota closed and the northern red hake possession limit is reduced to 400 lb.

Under Alternative 2, Option 1, the overall impacts to protected species are expected to be slightly negative to slightly positive. Option 1 is expected to have slightly negative to slightly positive impacts on non-ESA-listed (i.e., MMPA protected) marine mammals, and negligible to slightly negative impacts on ESA-listed species. Compared to the No Action alternative, Alternative 2 Option 1 is slightly negative given the potential for shifts in effort to avoid catching northern red hake, which could result in increased interaction risks in areas with increased levels of concentrated effort in the Gulf of Maine. Option 1 could slightly increase negative effects to ESA listed species and introduce slight negative impacts to MMPA species in good condition (i.e., remove the status quo conditions that maintain indirect positive impacts).These specifications would likely support similar fishing effort as seen in recent years, which would be continuing current operating conditions that are not expected to result in the exceedance of any non-ESA listed stocks/species PBR levels, resulting in a slightly positive impact on these species. There may be slight negative impacts to non-ESA listed stocks/species that are currently in poor condition. Option 1 is also likely to have a negligible to slight negative impact on ESA-listed species, given that the potential risk of interactions varies between species. Compared to Alternative 1, Alternative 2 Option 1 will likely have negligible impacts.

6.4.2.2 Northern red hake Total Allowable Landings (TAL) Option 2 (Preferred)

Overall, and compared to No Action, the impacts on protected species (i.e. ESA-listed and/or MMPA protected) are the same as described above in Section 6.4.2. Alternative 2, Option 2 is likely to have slightly negative to slightly positive impacts on protected species, with slightly negative to slightly positive impacts on non-ESA-listed (i.e., MMPA protected) marine mammals, and negligible to slightly negative impacts on ESA-listed species. Similar to Option 1, the TAL for northern red hake would be lower compared to Alternative 1 (No Action), which may have a slightly more positive impact than No Action if, although unlikely, fishing effort decreases. Though the TAL for Option 2 would be a much smaller decrease than Option 1 (9% decrease compared to 85%, respectively), this change is not expected to impact fishing effort (see Section 6.2.2.2 and 6.3.2.1), and would therefore likely result in negligible impacts compared to Option 1. This smaller decrease in TAL would also likely continue normal small-mesh multispecies fishing for longer without increasing red hake discards or causing changes in fishing location to avoid them than would occur under Option 1.

6.5 Impacts on Physical Environment and Essential Fish Habitat

6.5.1 Alternative 1 – No Action

Under current catch specifications, and as a result of the ACL and in-season/post-season AMs, the small-mesh multispecies fishery performance has remained stable. Therefore, Alternative 1 (No Action) is not expected to change fishing effort or behavior and habitat impacts from small-mesh multispecies fishing gear are expected to be the same as they have been in the recent past and as described in Section 5.5.3. Trawl gear, used primarily by the small-mesh multispecies fisheries, will continue to cause adverse impacts to the seafloor habitats fished by this fishery, but these areas have been fished in the past, and fishing grounds are not expected to change in the future. These areas have been identified as EFH for various species that are managed under the Northeast Multispecies FMP and other Greater Atlantic Region FMPs. Thus, the No Action alternative would have a slightly negative impact on the physical environment and EFH. Relative to Alternative 2, the expected impact of No Action is negligible, because substantial changes in fishing activity (magnitude or distribution of effort) are not anticipated.

6.5.2 Alternative 2 - 2024-2026 Specifications Adjustment (Preferred Alternative)

Alternative 2 would increase the ACL for northern silver hake, but fishing effort is not expected to change because of this increase. Conversely, the ACLs for southern whiting and northern red hake would decrease under Alternative 2 but, similarly, are not expected to limit catch. These assumptions about fishing effort are reasonable because northern silver hake, southern whiting, and northern red hake catch have not been limited by their respective ACLs in recent years (Figure 2 and Figure 5). This alternative would also increase the ACL for southern red hake, although the TAL would decline. Although southern red hake catch exceeded the ACL in 2018 and 2019 and AMs were triggered, changes to the ACL and TAL under Alternative 2 are not likely to impact fishing effort (Table 7). Options 1 and 2 for Alternative 2 could potentially result in shifts in fishing locations if fishermen are avoiding northern red hake, which are primarily found on the northern portion of Georges Bank into the Gulf of Maine (Map 4). For example, fishing effort may increase in areas where northern silver hake are more prevalent, such as Georges Bank and Southern New England (Map 3). Even if there are some spatial shifts in effort, this fishing activity would be occurring in areas where there is currently (or recently has been) fishing effort, resulting in similar levels of impacts. Overall, fishing effort under Alternative 2 for all stocks is not likely to change relative to current activity, and therefore the impact of small-mesh multispecies fishing gear on the physical environment and EFH are expected to remain slightly negative. When compared to Alternative 1 (No Action), impacts of Alternative 2 would likely be negligible.

6.5.2.1 Northern red hake Total Allowable Landings (TAL) Option 1

Overall, and compared to No Action, the impacts on the physical environment and essential fish habitat are the same as described above in Section 6.5.2. For northern red hake, though the TAL would decrease by 85% compared to No Action, it is not expected to constrain fishing effort. Fishing effort is anticipated to remain similar to recent years and the fishery would likely continue to have a slightly negative impact on the physical environment and EFH. The TAL would decrease by 85% in Option 1 and 9% in Option 2, which could have differing impacts in terms of shifting fishing locations. Option 1 could be more likely to lead to changes in fishing locations to avoid catching red hake (see Map 3 and Map 4 for silver hake and red hake distribution). Because substantial changes in effort are not expected regardless of which option is adopted, Options 1 and 2 are expected to have very similar impacts to EFH.

6.5.2.2 Northern red hake Total Allowable Landings (TAL) Option 2 (Preferred)

The impacts of Alternative 2, Option 2 would likely be slightly negative, with negligible differences between both Alternative 1 (No Action) and Alternative 2, Option 1. While the TAL for northern red hake would be higher under Option 2 than Option 1, this is not likely to substantially impact fishing effort, and will therefore maintain similar levels of impacts to the physical environment and EFH. The increased TAL compared to Option 1 does provide an opportunity for vessels to continue fishing for small-mesh multispecies as normal, without changing fishing behavior and locations to avoid catching northern red hake and discarding them when the quota is reached and the possession limit decreases to 400 lb. Thus, compared to Option 1, Option 2 could reduce impacts on areas where red hake are not frequently caught (on mud or mud/sand bottoms).

6.6 Impacts on Human Communities

The analysis of impacts on human communities characterizes the magnitude and extent of the economic and social impacts likely to result from the alternatives considered for the FY 2024-2026 small-mesh multispecies fishery specifications. National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen will be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

The specific communities that may be most impacted by this action are identified in Section 5.6.3. They include five to fourteen communities on the east coast, from Portland, ME to Barnegat Light, NJ (Table 17 and Table 18). Communities are likely to experience impacts proportional to their degree of participation in the small-mesh multispecies fishery. The communities listed in this document are more likely to experience direct impacts of the action, though indirect impacts can be experienced across communities with varying participation levels in the fishery. The following analyzes the economic and social impacts of the potential specifications for FY 2024-2026 primarily based on the impacts on the targeted species landings.

Methods

This economic analysis uses the TAL utilization rates as a basis for expected landings in both Alternative 1 (No Action) and Alternative 2 with two options on northern red hake. The utilization rates of whiting have remained quite low during past five years, i.e., about 5% to 14% for the northern silver hake and 6% to 28% for the southern whiting. The TAL utilization rates for red hake have ranged between about 3% to a little over 100% over the same time period (Table 29).

This economic analysis uses the most recent TAL utilization rates (i.e., 2021-2023 specifications) to derive landing estimates for silver hake or whiting under Alternative 1 (No Action) and Alternative 2 (with Options 1 and 2), assuming that the most recent fishing behavior and market or environmental conditions are likely to persist in the upcoming years as well. If the derived landings estimate for northern or southern whiting stock is less than recent landings, then average landings from the recent specification period is used as landing estimate for the stock. It is assumed that the recent past landings of northern silver hake or southern whiting are most likely to be achieved in the proposed specification period as well, as there is plenty of room to improve TAL utilization rates even with reduced TAL for some stocks due to price incentives, landings per unit effort (LPUE) improvements, more directed fishing effort, new entrants to the open access fishery, and other factors. The average TAL utilization rates during 2021 and 2022 for northern silver hake and southern whiting stocks are used for the economic estimates of the alternatives.

For red hake stocks, full or 100% TAL utilization rate is assumed for landings and economic estimates. It is important to note that TAL utilization rates for red hake in both management areas have been quite variable over the past five years, ranging from about 3% to over 100% (Table 29). Considering the relatively high discard rates for red hake, TALs for these stocks have been set at low levels in the past. In recent years, low TALs for the species in both stocks have been fully or nearly fully utilized, though this may not be the case in the near future given recent trends in fishing effort.

Table 29. TAL Utilization rates (landings/TAL) in the past five years, FY 2018-2022.

Specifications	Year	Northern Silver Hake	Southern Whiting	Northern Red Hake	Southern Red Hake
2018-2020	**2018**	8.45%	21.91%	96.87%	132.40%
2018-2020	**2019**	5.01%	27.91%	104.07%	110.10%
2018-2020	**2020**	5.17%	26.87%	47.96%	93.47%
2021-2023	**2021**	11.08%	7.74%	2.82%	38.66%
2021-2023	**2022**	13.64%	6.13%	4.14%	20.41%
5-yr Average		**8.67%**	**18.11%**	**51.17%**	**79.01%**
2018-2020 Average		**6.21%**	**25.56%**	**82.97%**	**111.99%**
Recent 2-year (2021-2022) Average		**12.36%**	**6.94%**	**3.48%**	**29.53%**

The economic analysis of the alternatives for FY 2024-2026 specifications is based on the expected revenues for the alternatives under consideration, as there is no cost information available for small-mesh multispecies landings. Moreover, these species are also landed as bycatch or incidental catch while targeting other species including squids, herring, and groundfish. However, about two-thirds of whiting landings are from directed efforts, i.e., landings over 2,000 pounds in a trip for whiting or 400 pounds for red hake. If cost information were available, it would vary by fleet or gear characteristics, fishing locations, and nature of harvests combined with other species.

Ex-vessel values for the expected landings of whiting and red hake are estimated using the recent two-year annual average prices (in 2022 dollars). Expected revenues for different stocks and their aggregates are compared for the alternatives at the average TAL utilization rates, or at average recent landings values when a landings estimate derived from the TAL utilization rate in the proposed specification falls below recent landings values.[16] In this analysis, differences in revenues are used as a close proxy for changes in net economic values for economic inferences and as a basis for management decisions.

6.6.1 Alternative 1 – No Action

The No Action alternative would maintain the current specifications (Table 6) which were analyzed in the Small-Mesh Multispecies Fishing Year 2021-2023 Specifications EA (NEFMC 2021a).

[16] It is safe to apply this rule for landing estimates since both stocks of silver hake are not overfished and overfishing is not occurring as of recent years. Exploitation is well below the overfishing threshold and catches since 2012 have been well below the annual specifications.

Alternative 1 is expected to have negligible to slightly positive economic impacts on the small-mesh fishery as a whole. Recent landings have been substantially lower than TAL, suggesting that TAL is not a constraining factor in metrics such as profit maximization. Under Alternative 1, there is a potential for increases in fishing effort and higher utilization of the ACL. This could have a slight positive economic effect due to the increase in fishing revenue, offset by potentially less fishing to target other stocks. By the same token, the opportunity to target northern silver hake and southern whiting under Alternative 1 ACLs can act as a viable alternative when and if the biomass of other target stocks and/or prices for them decline.

The potential ex-vessel value of the Alternative 1 TAL is estimated to be about $116.5 million. Because of the lower TAL utilization rates, the average revenue from small-mesh multispecies landing is expected to be about $13.19 million (in 2022 dollars) (Table 30). The potential value (in 2022 dollars) of the TAL under No Action amounts to about $114 million[17] from silver hake/whiting and about $3 million from red hake in both northern and southern management areas (Table 30). However, realized revenues have been much lower. Small-mesh multispecies fishery performance has remained stable over the last nine years, with revenue from small-mesh multispecies ranging between $10.2 to $13.8 million (in 2022 dollars) since the specifications were implemented. Despite increases in biomass of silver hake and northern red hake, landings and revenue have declined in recent years, which is attributable to changes in market demand and restrictions placed on the fishery to minimize the catch of large-mesh groundfish (Table 30). The revenue from small-mesh multispecies fluctuated between $10.2 to $11.4 million in the past three years (2020-2022). Table **16** provides a summary of small multispecies effort, landings, revenue, and prices by management area for trips landing 1 or more pounds of whiting or red hake from 2012 to 2022.

Compared to Alternative 2 (Options 1 AND 2), the social impacts of Alternative 1 are expected to be negligible to slightly negative, and negligible compared to Alternative 2 (Options 1 and 2). The Alternative 1 specifications have not been constraining and are not expected to constrain the fishery if implemented. This would likely maintain some stability in communities dependent on the small-mesh fishery, supporting similar levels of employment in the fishery as well as related businesses. However, Alternative 1 does not use updated data or follow the SSC recommended ABCs and OFLs to prevent overfishing. Alternative 1 would maintain an ABC below the SSC recommended level for northern silver hake and southern red hake, while ABCs for southern whiting and northern red hake would be above the SSC recommended levels. Alternative 1 would likely have negligible impacts in the short term, given that catch remained below the ACL in FY 2020-2022 for all four stocks. However, implementing specifications with ABCs above SSC recommended levels (i.e. for southern whiting and northern red hake) could have negative impacts on the fishery in the long term, which would negatively affect communities dependent on the small-mesh species fishery, and could lead to negative attitudes of stakeholders towards management.

[17] This revenue from whiting may not be realized since such large volume of landings will also depress price.

Table 30. Summary of economic impacts of Alternative 1 (No Action).

Stock	Alternative 1 (No Action, 2021-2023 specifications)				
	TAL (mt)	TAL (lbs)	Potential TAL Revenue (2022 $)	Expected Landings lbs.	Expected Revenue from Landings (2022 $)
Northern silver hake	17,457	38,475,228	$42,899,879	4,756,209*	$5,303,173
Southern whiting	28,742	63,347,368	$70,632,315	4,393,779*	$4,899,064
Northern red hake	1,405	3,096,620	$2,299,240	3,096,620**	$2,299,240
Southern red hake	422	930,088	$690,590	930,088**	$690,590
Aggregated values:					
Whiting/ Silver hake	46,199	101,822,596	$113,532,195	9,149,988	$10,202,237
Red hake	1,827	4,026,708	$2,989,831	4,026,708	$2,989,831
Small-mesh multispecies	48,026	105,849,304	$116,522,025	13,176,696	$13,192,067

*Expected landing for silver hake or whiting in the No Action alternative is derived based on recent past 2-year TAL utilization rates (Table 29).
** Expected landing for red hake at full TAL utilization.

6.6.2 Alternative 2 - 2024-2026 Specifications Adjustment (Preferred)

Alternative 2 would modify the specifications to be consistent with updated data from the September 2023 Management Track Assessment. The 2024-2026 specifications relative to No Action would decrease the TAL for red hake (northern with Option 1 and 2; and southern) and southern whiting but would increase the TAL for northern silver hake (Table 7, Table 8).

Overall, and relative to No Action, the expected economic impact is slightly positive because the TAL limits on northern silver hake (the stock that contributes to the majority of small-mesh multispecies fishery landings in recent years) would increase by 80%. Utilization rates are quite low across all stocks and are not expected to substantially increase unless external factors (e.g., squid and herring availability, whiting prices, directed effort) change. For southern whiting, it is assumed that the current specification period's average landings could be achieved even with reduced TAL for this stock because of huge upside potential for landings when opportunities or incentives arise. Moreover, the stock is not currently overfished and overfishing is not occurring. Similar to Alternative 1, there is a potential for increases in fishing effort and higher utilization of the ACL. This could have a slight positive economic effect due to the increase in fishing revenue, offset by potentially less fishing to target other stocks. By the same token, the opportunity to target northern silver hake and southern whiting under Alternative 1 ACLs can act as a viable alternative when and if the biomass of other target stocks and/or prices for them decline.

The potential ex-vessel value of TAL in Alternative 2 would be about $112 million, but the expected revenue from small-mesh multispecies landings would range between $16 and $17 million (in 2022 dollars) (Table 29, Table 31). Assuming that red hake TAL in both stocks will be fully utilized, the expected value of small-mesh multispecies landings in the Alternative 2 ranges between $15.68 million (in Option 1) to $17.42 million (in Option 2) (Table 33). The potential TAL value in Alternative 2 is slightly lower than the No Action alternative primarily due to decline in TAL for the southern whiting by about 55%. Because of the relatively higher TAL utilization rate in the northern silver hake relative to the southern whiting in recent years, Alternative 2 has slightly positive overall economic impact relative to Alternative 1. The impact on human communities from Alternative 2 on average is slightly positive by about $2.49 million (in Option 1) to $4.23 million (in Option 2) relative to No Action. Most of the positive economic impact is expected to largely come from the northern silver hake due to increased TAL for the stock (Table 31 and Table 32).

The social impacts of Alternative 2 are expected to be slightly positive. These specifications were developed using updated data from the 2023 management track assessment, and were recommended by the SSC to prevent stocks from becoming overfished or experience overfishing. Following these recommendations is expected to have positive effects in the long-term. Though ABCs decreased for two stocks, the specifications are not expected to be constraining to the fishery and would offer similar support for employment opportunities in the small-mesh fishery and related industries (processing, distribution, etc.) as Alternative 1. An increase in the ABC for northern silver hake could provide additional opportunities in the sector if demand for the species increases and would likely lead to positive attitudes from stakeholders towards management. The impacts of Alternative 2 may differ slightly for vessels that fish in the northern and southern management areas. Though substantial changes in fishing effort are not anticipated, the increased ABC for northern silver hake may offer some marginal benefits for the home ports of vessels fishing in the northern management area, such as Gloucester, MA. However, many fishing vessels travel from ports adjacent to the northern or southern management areas to other areas to reach fishing grounds, making the potential benefits of changes in ABCs difficult to attribute to specific communities. Given the low likelihood that updated specifications would change fishing effort, the social impacts of Alternative 2 are expected to be negligible compared to Alternative 1.

Table 31. Summary of economic impacts of Alternative 2, Option 1.

Stock	Alternative 2 (2024-2026 Specifications)					
	TAL (mt)	TAL (lbs)	Potential TAL Revenue (2022 $)	2-yr Avg TAL Utilization Rates (L/TAL)	Expected Landings (lbs)	Expected Revenue (2022 $)
Northern silver hake	31,347	69,088,788	$77,033,999	12.36%	8,540,579	$9,522,745
Southern whiting	13,881	30,593,724	$34,112,002	6.94%	4,756,209*	$5,303,173
Northern red hake (Option 1)	213	469,452	$348,568	3.48%	469,452**	$348,568
Southern red hake	314	692,056	$513,852	29.53%	692,056**	$513,852
Aggregate Values:						
Whiting/ Silver hake	45,228	99,682,512	$111,146,001	n/a	13,296,788	$14,825,918
Red Hake w/ Option 1	527	1,161,508	$862,420	n/a	1,161,508	$862,420
Small-mesh Multispecies w/ Option 1	45,755	100,844,020	$112,008,421	n/a	14,458,296	$15,688,338

*Expected landing at 2021 and 2022 average landings.
** Expected landing at full TAL utilization.

Table 32. Summary of economic impacts of Alternative 2, Option 2.

Stock	Alternative 2 (2024-2026 Specifications)					
	TAL (mt)	TAL (lbs)	Potential TAL Revenue (2022 $)	2-yr Avg TAL Utilization Rates (L/TAL)	Expected Landings (lbs)	Expected Revenue (2022 $)
Northern silver hake	31,347	69,088,788	$77,033,999	12.36%	8,540,579	$9,522,745
Southern whiting	13,881	30,593,724	$34,112,002	6.94%	4,756,209 *	$5,303,173
Northern red hake (Option 2)	1,274	2,807,896	$2,084,863	3.48%	2,807,896**	$2,084,863
Southern red hake	314	692,056	$513,852	29.53%	692,056**	$513,852
Aggregate Values:						
Whiting/ Silver hake	45,228	99,682,512	$111,146,001	n/a	13,296,788	$14,825,918
Red Hake w/ Option 2	1,588	3,499,952	$2,598,714	n/a	3,499,952	$2,598,714
Small-mesh Multispecies w/ Option 2	46,816	103,182,464	$113,744,715	n/a	16,796,740	$17,424,633

*Expected landing at 2021 and 2022 average landings.
** Expected landing at full TAL utilization.

Table 33. Summary of differences in revenues assuming that the fishery lands the TAL comparing Alternative 1 (No Action) to Alternative 2, Options 1 and 2.

Stock	Difference in Expected Revenues of Alternative 2 (Options 1 and 2 for Northern red hake TAL) from No Action	
	Option 1	Option 2
Northern silver hake	$4,219,572	$4,219,572
Southern whiting	$404,109	$404,109
Northern red hake	-$1,950,672	-$214,378
Southern red hake	-$176,739	-$176,739
Aggregated values:		
Whiting/Silver Hake	$4,623,682	$4,623,682
Red Hake	-$2,127,411	-$391,116
Small-mesh Multispecies	$2,496,271	$4,232,565

6.6.2.1 Northern red hake Total Allowable Landings (TAL) Option 1

Overall, and compared to No Action, the economic impacts are the same as described above in Section 6.6.2. Though the expected revenue from northern red hake would fall by about $1.95 million relative to No Action, there is still a net positive economic impact given the increase in northern silver hake specifications (Table 33). By substantially reducing the TAL for the northern red hake relative to the No Action TAL, in-season AMs may be triggered early resulting in a potentially premature closure of the fishery. Relative to Option 2, Option 1 would have a slightly negative impact because it could potentially restrict red hake landings and revenue. Table 33 summarizes the economic impacts of Alternative 2, Option 1.

6.6.2.2 Northern red hake Total Allowable Landings (TAL) Option 2 (Preferred)

The higher TAL presented in Option 2, while not anticipated to substantially impact fishing effort, would allow for flexibility should landings increase compared to recent years. This would allow the fishery to continue to operate with a lower risk of triggering in-season AMs when there is a corresponding low risk of overfishing given current biomass estimates and fishing effort. Option 2 would likely have a slightly positive social impact as outlined in Section 6.5.2. This option may have some additional positive social impacts because it would provide more of a buffer between the TAL and anticipated fishing effort, reducing the likelihood of triggering in-season AMs and allowing participants in the fishery to continue the season. Thus, Option 2 would have a slightly positive economic impact relative to Option 1. Table 33 summarizes the economic impacts of Alternative 2, Option 2 relative to Option 1 and No Action.

6.7 Cumulative Effects Analysis

6.7.1 Introduction

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ; 40 CFR part 1508.7) and NOAA policy and procedures for NEPA, found in NOAA Administrative Order 216-6A (Companion Manual, January 13, 2017). The purpose of the CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective. Rather, the intent is to focus on those effects that are truly meaningful. The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed small-mesh multispecies fishery.

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

6.7.1.1 Consideration of the Valued Ecosystem Components (VECs)

The valued ecosystem components for the small-mesh multispecies fishery are generally the "place" where the impacts of management actions occur and are identified in Section 5.0.

- *Target Species (Silver hake, red hake)*
- *Non-target Species*
- *Physical Environment / Essential Fish Habitat*
- *Protected Species*
- *Human Communities*

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

6.7.1.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the commercial and recreational harvest of small-mesh multispecies. The Western Atlantic Ocean is the core geographic scope for each of the VECs, as described in the Affected Environment (Section 5.0). For non-target species, that range may be expanded and would depend on the range of each species in the Western Atlantic Ocean. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by small-mesh multispecies stocks and non-target species in the Western Atlantic Ocean. The core geographic scope for protected species is their range in the Western Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities in coastal states from Maine to New Jersey directly involved in the harvest or processing of small-mesh multispecies (Section 5.6.3).

6.7.1.3 Temporal Boundaries

Overall, while the effects of the historical small-mesh multispecies fishery are important and considered in the analysis, the temporal scope of past and present actions for small-mesh multispecies, non-target species and other fisheries, the physical environment and EFH, and human communities is primarily focused on actions that occurred after FMP implementation (2000). An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery. For protected species, the scope of past and present actions is focused on the 1980s and 1990s (when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ) through the present.

The temporal scope of future actions for all VECs extends about five years (2029) into the future beyond the implementation of this action. The dynamic nature of resource management for these species and lack of information on projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty. The impacts discussed in Section 6.7.4 are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

6.7.2 Relevant Actions Other Than Those Proposed in this Document

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

6.7.2.1 Fishery Management Actions

Most of the actions affecting the VECs come from fishery-related activities (e.g., Federal fishery management actions), which have straightforward effects on environmental conditions, and were, are, ore will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management, the reauthorized Magnuson-Stevens Act (SFA 2996). That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the MSA stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should likely result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socioeconomic impacts on fishery participants. However, these impacts are usually necessary to bring about the long-term sustainability of a given resource, and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource. Generally, these actions have had low negative impacts on habitat due to continued fishing operations; however, some actions have had direct or indirect long-term positive impacts on habitat through designating or protecting important habitats. FMP actions have also had a range of impacts on protected species, including generally slight negative impacts on ESA-listed species, and a range of impacts on non-ESA-listed marine mammals from slightly negative to slightly positive, depending on the species.

6.7.2.1.1 Small-Mesh Multispecies FMP Actions

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

Taken together, these past, present, and reasonably foreseeable future actions meet the objectives to optimize yield to provide societal benefits while preventing overfishing and reducing the risk that small-mesh species become overfished. They also achieve this while minimizing the catch of regulated groundfish stocks that sometimes co-occur or overlap with small-mesh multispecies, as a measure to reduce the risk of overfishing large-mesh groundfish stocks. Future actions are expected to continue achieving these benefits while minimizing effects on other marine resources and also increase the biomass of southern red hake by limiting catch and promoting the use of selective fishing gears.

Target Species

<u>Past and Present Actions</u>

Section 3.3 of Framework 62 (NEFMC 2021b) describes the past management actions that regulate the small-mesh multispecies fishery. Most relevant to this EA (this document) are the following actions:

Amendment 1 (1987) reduced the spatial footprint of the winter inshore whiting fishery to protect struggling large-mesh species like gray sole, and dabs; focused the small-mesh target species to large-mesh species ratio on a selected set of species; and reduced the size of the Georges Bank whiting fishery area to protect yellowtail flounder.

Amendment 4 (1991) established the Cultivator Shoals Exemption Area and formally incorporated silver hake and red hake into the FMP. This amendment also established a minimum mesh size for the directed small-mesh fishery as well. This was intended to control the mortality of whiting and red hake in this fishery.

Framework Adjustment 6 (1994) was intended, in part, to reduce juvenile whiting mortality in the Cultivator Shoals whiting fishery and modified the requirements of that program.

Framework Adjustment 9 (1995) established Small Mesh Areas I and II in the Gulf of Maine and implemented the requirements for fishing in those areas.

Amendment 12 (1999/2000) addressed many small-mesh issues. This amendment officially incorporated offshore hake into the FMP; established essential fish habitat designations for all three small-mesh species; standardized the mesh-size based possession limits (see below); required a Letter of Authorization for several small-mesh exemption areas; and established a provision to allow the transfer of up to 500 lb. of small-mesh multispecies at sea.

Framework Adjustment 35 (2000) established the Raised Footrope Trawl Exemption Area off Cape Cod. A Modification to Framework 35 (2002) modified the boundaries and seasons of the Cape Cod exemption areas.

Framework Adjustment 38 (2003) established the Inshore Gulf of Maine Grate Raised Footrope Trawl Exemption Area along the coast of Maine.

Amendment 19 (2013) modified the accountability measures, adopted new biological reference points, and established a trip limit for red hake. It established specifications for the four stocks in the fishery and an accountability measure in the form of a triggered 400 lb. red hake or 2000 lb. northern silver hake or southern whiting possession limit when landings reach 90% of the TAL. This TAL trigger is reduced for prior overages, i.e. when the total catch exceeds the ACL to reduce the risk of continued overfishing. To reduce the risk of overfishing due to uncertainty, the specification framework included a P* risk approach to account for scientific uncertainty and a 5% buffer to account for management uncertainty.

Specifications adjustments for 2015-2017, 2018-2020, and 2021-2023 changed the overfishing level and annual catch limits to respond to changes in stock biomass, changes in discarding rates, and changes in state water landings (NEFMC 2015, 2018b, 2021b).

Post-season accountability measures in 2014, and 2016 to account for 2013 and 2015 northern red hake catch overages and in 2019 to account for 2018 southern red hake catch overages. Because southern red hake catch also exceeded the annual catch limit during 2019, the post-season accountability measure would have taken effect in 2021 but was deferred because the effect of the 2018 accountability measure was not implemented until 2020 and the effects of pending Framework 62 (see below) have not yet been observed.

Framework 62 to the small-mesh multispecies fishery management plan, which established a 10-year rebuilding plan for southern red hake, was implemented in January 2022. The action specified that, “While the southern red hake stock is under a rebuilding plan, the ABC for that stock shall be set to 75-percent of the OFL for the duration of the rebuilding period or until the stock reaches its biomass target, whichever comes first.” Southern red hake possession limits were also reduced to 1,000 lb. for large mesh trawls and other more selective gear types and 600 lb. for small mesh trawls. An in-season accountability measure reduces the possession limit to 400 lb when the TAL trigger (40.4% of the ACL) is reached.

The two Framework 62 measures described above were approved by the Council on June 25, 2020 based on prevailing assessments that indicated the southern red hake biomass was below the threshold set by the overfishing definition. NOAA Fisheries determined the stock to be overfished and directed the Council to formulate a rebuilding plan, leading to the creation of Framework 62. The Council submitted the final Framework 62 document to NOAA Fisheries on January 12, 2021. A final rule was published on January 25, 2002.

During this period, the Northeast Fisheries Science Center conducted a "Red Hake Stock Structure Peer Review Meeting," which identified shortcomings in the existing assessment model. This model was replaced by an efficiency-adjusted swept area model, which the management track assessment used to conclude that the status of southern red hake was unknown" but the exploitation rate was estimated to be very low for most of the time series. This assessment was updated at a September 2020 and September 2023 management track assessment with the same findings and status determination.

Although an overfishing level (OFL) has not been estimated since the 2020 research track assessment rejected the analytical model and associated reference points, the Council reduced the 2021-2023 ABC that had been recommended by the Scientific and Statistical Committee. The 2021-2023 SSC recommendations for ABC would have otherwise increased the ABC and TAL by 89 and 88 percent, respectively. To support the rebuilding plan, the Council recommended a 25 percent ABC reduction, resulting in the ABC and TAL increasing by only 42 and 38 percent, respectively. The Council considered reducing the ABC by 25% because of the large potential increase in southern red hake specifications resulting from SSC advice and recent catch exceeding the ABC. The Council opted for a more risk-aware measure that would promote rebuilding prospects. Subsequently, catch has been substantially below the ABC since fishing year 2021 and the Council did not consider additional ABC reductions for FY 2024-2026 necessary to promote rebuilding.

<u>Reasonably Foreseeable Future Actions</u>

There are no other immediate actions on the horizon for small-mesh multispecies on the horizon. In January 2024, the Council submitted proposals for funding under the Inflation Reduction Act (IRA) to support climate-resilient fisheries. One of the proposals may include changes to the whiting fishery management plan, which may alter the rules for the small-mesh multispecies exemption areas if there is reason to do so. Experimental fishery results are needed to justify such a change in exemption area boundaries, seasons, and gear restrictions, so implementation of such changes are at least 3 years away. Work will begin on these projects in late 2024 or early 2025 and are expected to conclude in 2027.

Non-target Species

There are no small-mesh multispecies actions that directly manage non-targeted species. However, the small-mesh multispecies fishery regulations are intended to allow vessels to use trawls in specific seasons, areas, and gear configurations to avoid catching unacceptable amounts of regulated, large-mesh groundfish. Some of these groundfish stocks are overfished but could rebuild under existing groundfish regulations. To the extent that small-mesh multispecies trawl fishing could occur without jeopardy to (particularly overfished) groundfish stocks, small-mesh multispecies regulations could be relaxed, having either positive or slightly negative effects on non-target species that the small-mesh multispecies fishery could encounter.

Protected Resources

There have been no specific actions to reduce interaction risks to protected resources from the small-mesh multispecies fishery. However, while not specific to the small-mesh multispecies fishery, there are past, present, and reasonably foreseeable future actions that are relevant for this cumulative effects assessment. These past actions are still relevant to the present and/or future actions and are provided in Section 6.7.2.1.3.

Physical Habitat/EFH

Small-mesh multispecies fishing is governed by the Omnibus Habitat Amendments, which the Council periodically reviews and adjusts. Most small-mesh multispecies fishing, however, occurs in mud and mud/sand bottom that is considered to be less vulnerable to disturbance from fishing. Thus, there are no foreseeable actions on the horizon that could affect the small-mesh multispecies fishery or address the effects of the fishery on habitat and EFH.

Human Communities

All actions taken under the small-mesh multispecies FMP would have effects on human communities. Regular changes in specifications occur every three years and which has positive impacts in the long-term from setting fishing limits to ensure the long-term sustainability of the resource. Many actions have included specific measures designed to improve flexibility and increase efficiency from measures such as revising effort controls. Future changes in exemption area regulations may also have positive impacts on human communities if they allow for expanded opportunities for small-mesh multispecies fishing. On the other hand, greater restrictions that reduce opportunities or increase fishing costs could have negative impacts. There are no immediate foreseeable actions, but the Council is developing proposals to build climate-resilient fisheries which could culminate in actions to change where, when, and how small-mesh multispecies fishing can occur.

6.7.2.1.2 Other Fishery Management Actions

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

The FMPs that have had the greatest impact on small-mesh fishery VECs, other than the Small-Mesh Multispecies FMP, are the Northeast Multispecies, Monkfish, Atlantic Sea Scallop, Atlantic herring, Atlantic mackerel, and Squid FMPs because of the spatial overlap of the fisheries and the relatively high level of incidental catch of southern red hake in those fisheries. Actions in related FMPs have a lesser effect on silver hake and whiting stocks because bycatch is relatively low, but these other management actions could have a greater effect on the small-mesh multispecies if there are effort shifts from other fisheries due to increasingly restrictive regulations, changes in market demand and prices, and potentially changes in species distribution affected by climate change.

<u>*Past and Present Actions*</u>

Northeast Multispecies: Framework Adjustment 68 to the Northeast Multispecies FMP, which would consider adjustments to the Council's acceptable biological catch (ABC) control rules for groundfish, is currently under development.

Atlantic Herring: Atlantic herring specifications for FY 2023-2025 were implemented in March 2023.

Squid: Illex and Loligo squid fisheries are managed by the Mid-Atlantic Fishery Management Council through its Squid, Mackerel, and Butterfish FMP. There is an overlap in vessels in the Loligo squid and whiting fisheries on Georges Bank, thus actions in the squid fishery affect fishing effort in the whiting fishery and vice versa. Although there are impediments to fishing for squid (gear restricted areas, windfarm lease areas, small mesh restrictions, etc.), stock biomass, catch limits, and catch has increased in recent years. Loligo squid are managed via trimester quotas and measures, which can have an effect on when vessels switch to fishing for whiting, which can cause market glut and depressed whiting pricing.

Currently, Loligo squid abundance is high, and landings have increased in recent years, with 2022 revenues setting a new record for the fishery (MAFMC 2023). Loligo squid are not overfished, and the stock biomass has remained above the B_{msy} proxy threshold in recent years. Amendment 20 through the Mid-Atlantic Fishery Management Council reduced latent directed permits, created limited access incidental permits, and lowered Trimester 2 post-closure trip limit to 250 pounds to discourage directed fishing after closures.

Atlantic Mackerel. Mackerel are managed by the Mid-Atlantic Fishery Management Council through its Squid, Mackerel, and Butterfish FMP. Amendment 23 to the FMP, effective February 2023, implemented a revised rebuilding plan for the Atlantic mackerel stock with a target date of 2032, as well as set specifications for FY 2023.

Monkfish. The Council developed Monkfish Framework 13, which set specifications for FY 2023-2025, adjusted annual Days-At-Sea (DAS) allocations, and increased the minimum gillnet mesh size for vessels fishing on a monkfish DAS beginning in 2026. Framework 13 was effective August 11, 2023. In addition, the Council recently took final action on Monkfish Framework 15, which is a joint framework action developed in conjunction with the Mid-Atlantic Fishery Management Council that would establish measures to reduce bycatch of Atlantic sturgeon in the monkfish and spiny dogfish large-mesh gillnet fisheries.

Atlantic Sea Scallops. Framework Adjustment 38, which included fishing year 2024 and default fishing year 2025 specifications for the scallop fishery along with increasing the VMS reporting rate seaward of the demarcation line on declared scallop trips, was implemented in April 2024.Changes in scallop regulations are relevant because of their overlap and biological association with juvenile red hake.

Habitat: In September 2023, the Council completed a final submission of the Southern New England Habitat Area of Particular Concern Framework, which was included as Framework Adjustments to the groundfish, sea scallop, monkfish, skate complex, and herring FMPs.

Northeast Skate Complex: The Council recently submitted a final submission for Framework 12 to the Northeast Skate Complex FMP to NOAA Fisheries, which includes specifications for FY 2024-2025 as well as changes to possession limits. Should NOAA accept the Council's recommendation, this action would lower the ACL, increase wing possession limits, and remove species-specific possession limits for barndoor and smooth skates.

Reasonably Foreseeable Future Actions

Northeast Multispecies. These regulations and related small-mesh exemptions restrict fishing for whiting and red hake stocks, except in areas and seasons where large-mesh groundfish catches are acceptably low. These measures are part of the reason that the fishery does not usually achieve Optimum Yield.

Atlantic herring. The Council recently initiated Amendment 10 to minimize user conflicts, contribute to optimum yield, and support rebuilding of the Atlantic herring resource as well as consider river herring and shad management measures. Scoping for this amendment occurred from March 1 – April 30, 2024. Herring specifications for FY 2025-2027 will also be developed starting in summer 2024.

Squid. The MAFMC is not currently considering pending actions to regulate the squid fishery, but the focus is on improving the stock assessment to identify appropriate biological reference points. A management track assessment for shortfin squid is scheduled in 2025, followed by a research track assessment for longfin squid in early 2026. The outcome of this process could change the perception of the stock and future management strategy. It could affect the small-mesh multispecies fishery due to the overlap of vessels operating in both fisheries.

Atlantic Sea Scallops. Scallop specifications for fishing year 2025 will be developed starting in the summer.

Habitat. The Council is proposing to extend its habitat suitability modeling to identify management measures for EFH protection. Such measures if adopted could affect how, where, and when small-mesh multispecies trawl fishing could occur and also improve critical habitat for silver, offshore, and red hakes.

6.7.2.1.3 Protected Resources Actions

Protected resources impacted by the small-mesh multispecies fishery include sea turtles, large whales, small cetaceans, pinnipeds, Atlantic sturgeon, Atlantic salmon, and giant manta rays. The following past, present, and reasonably foreseeable future actions are relevant for the cumulative effects assessment of this action.

Past and Present Actions: NMFS has implemented specific actions to reduce injury and mortality of protected species from gear interactions as provided in Section 6.3. 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 Atlantic Trawl Gear Take Reduction Strategy for addition information on the strategy. These voluntary or regulatory measures have had slight to moderate positive impacts on these protected species by reducing the number of interactions with fishing gear.

On May 27, 2021, the NMFS completed formal consultation pursuant to section 7 of the ESA of 1973, as amended, and issued a biological opinion (2021 Opinion) on the authorization of eight FMPs, two interstate fishery management plans (ISFMP), and the implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2.[18] On January 10, 2024, NMFS issued a 7(a)(2)/7(d) memorandum that reinitiated consultation on the 2021 Biological Opinion. Consultation is currently ongoing; additional information on the reinitiation is provided in section 7.4.

In 2022, NOAA Fisheries held various forums to gather information from the public, fishing industry, and other stakeholder groups to inform any future measures for reducing sea turtle bycatch in trawl fisheries. Potential considerations to reduce sea turtle bycatch included ideas such as geographically extending the requirement of Turtle Excluder Devices northward, other gear modifications, or reduced tow durations. To date, no new bycatch reduction measures have been proposed.

Reasonably Foreseeable Future Actions:

On July 19, 2023, NMFS issued a proposed rule to designate new areas of critical habitat and modify existing critical habitat for threatened and endangered distinct population segments (DPSs) of the green sea turtle, in areas under U.S. jurisdiction, pursuant to the ESA (88 FR 46572). The comment period on the proposed rule closed on October 17, 2023; rule making is currently ongoing.

These future measures would likely have some degree of positive impacts on these protected species by reducing the number of interactions with fishing gear, and therefore, reducing the risk of injury and mortality to these protected species and/or adversely affecting habitat.

[18] The eight Federal FMPs considered in the May 27, 2021, Biological Opinion include: (1) Atlantic Bluefish; (2) Atlantic Deep-sea Red Crab; (3) Mackerel, Squid, and Butterfish; (4) Monkfish; (5) Northeast Multispecies; (6) Northeast Skate Complex; (7) Spiny Dogfish; and (8) Summer Flounder, Scup, and Black Sea Bass. The two ISFMPs are American Lobster and Jonah Crab.

6.7.2.1.4 Fishery Management Action Summary

The Council and NOAA Fisheries have taken many actions to manage small-mesh species and the associated commercial and recreational fisheries. The MSA is the statutory basis for federal fisheries management. The cumulative impacts on the VECs of past, present, and reasonably foreseeable future federal fishery management actions under the MSA should generally be associated with positive long-term outcomes because they constrain fishing effort and manage stocks at sustainable levels. Constraining fishing effort through regulatory actions can have negative short-term socioeconomic impacts. These impacts are sometimes necessary to bring about long-term sustainability of a resource, and as such should promote positive effects on human communities in the long-term. A summary of the cumulative impacts of past, present, and reasonably foreseeable future actions on each VEC is provided in the table below.

Table 34. Summary of expected impacts of combined past, present, and reasonably foreseeable future actions on each VEC.

VEC	Past Actions (P)	Present Actions (Pr)	Reasonably Foreseeable Future Actions (RFFA)	Combined Effects of Past, Present, and Future Actions
Target Species	**Positive** Combined effects of past actions have improved optimum yield and reduced the risk of overfishing.	**Positive** Specification adjustments reduce the risk of overfishing to acceptable levels and promote southern red hake biomass rebuilding	**Positive** Future actions are anticipated to strive to maintain a sustainable stock	**Positive** Stocks are being managed sustainably
Non-Target Species	**Positive** Combined effects of past actions have limited interactions with and bycatch of other stocks, some of which are currently overfished.	**Slightly negative to Slightly positive** The present actions do not increase or decrease exposure to other stocks that would be discarded or increase the risk of overfishing, but some changes in fishing location may increase or decrease risk depending on the species.	**Positive** Future regulations will be science based and may include new gears, technologies and ways of fishing to improved selectivity and minimize bycatch	**Positive** Measures limit interactions and bycatch of species that co-occur with whiting and red hake.

VEC	Past Actions (P)	Present Actions (Pr)	Reasonably Foreseeable Future Actions (RFFA)	Combined Effects of Past, Present, and Future Actions
Habitat	**Mixed** The effects of better control of non-fishing activities have been positive, but fishing activities and non-fishing activities have reduced habitat quality	**Mixed** Catch limits and better control of non-fishing activities have been positive, but fishing activities continue to affect habitat quality	**Mixed** Future regulations will likely control effort and habitat impacts but as stocks improve, effort may increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Protected Resources	**Negligible to Slightly positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Slightly negative to Slightly positive** Current regulations and market demand continue to limit effort, thus minimizing potential interactions, depending on species	**Slightly negative to Slightly positive** Future regulations will likely limit effort and thus protected species interactions, but as if demand and prices increase effort will likely increase, possibly increasing interactions	**Mixed** Continued catch limits on fishing effort along with past regulations will likely help stabilize protected species interactions
Human Communities	**Positive** The small-mesh multispecies fishery provides an alternative to target a healthy stock of whiting and northern red hake, providing jobs, income, and other benefits to coastal communities that are fishery-dependent.	**Positive** The present actions continue to provide an alternative for fishermen to target a healthy stock of whiting.	**Mixed** Future actions will continue to provide an alternative for fishermen to target a healthy stock of whiting. Windfarms and aquaculture siting could reduce access to the fishery and limit benefits.	**Mixed to Positive** Actions provide community benefits in the short- and long-term, but the benefits may be reduced by other oceanic development activities.

6.7.2.2 Non-Fishing Impacts

6.7.2.2.1 Other Human Activities

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

Examples of non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore wind farms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these activities primarily stem from habitat loss due to human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts on habitat related to accretion of sediments, pollutants, habitat conversion, and shifting currents and thermoclines. For protected species, primary concerns associated with non-fishing activities include vessel strikes, dredge interactions (especially for sea turtles and sturgeon), and underwater noise. These activities have both direct and indirect impacts on protected species. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the productivity of managed species, non-target species, and protected species. Decreased habitat suitability tends to reduce the tolerance of these VECs to the impacts of fishing effort. Non-fishing activities can cause target, non-target, and protected species to shift their distributions away from preferred areas, and may also lead to decreased reproductive ability and success (from current changes, spawning disruptions, and behavior changes), disrupted or modified food web interactions, and increased disease. While localized impacts may be more severe, the overall impact on the affected species and their habitats on a population level is unknown, but likely to have impacts that mostly range from no impact to slight negative, depending on the species and activity.

Non-fishing activities permitted by other Federal agencies (e.g., beach nourishment, offshore wind facilities) require examinations of potential impacts on the VECs. The MSA imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH (50 CFR 600.930). NMFS and the eight regional fishery management councils engage in this review process by making comments and recommendations on federal or state actions that may affect habitat for their managed species. Agencies need to respond to, but do not necessarily need to adopt these recommendations. Habitat conservation measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally-permitted activities could have on resources under NMFS' jurisdiction. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by Federal, state, and local authorities. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2)[19], which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

[19] "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not

In recent years, offshore wind energy and oil and gas exploration have become more relevant activities in the Greater Atlantic region. They are expected to impact all VECs, as described below.

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

Construction activities may have both direct and indirect impacts on marine resources, ranging from temporary changes in distribution to injury and mortality. Impacts could occur from changes to habitat in the areas of wind turbines and cable corridors and increased vessel traffic to and from these areas. Species that reside in affected wind farms year-round may experience different impacts than species that seasonally reside in or migrate through these areas. Species that typically reside in areas where wind turbines are installed may return to the area and adapt to habitat changes after construction is complete. Inter-array and electricity export cables will generate electromagnetic fields, which can affect patterns of movement, spawning, and recruitment success for various species. Effects will depend on cable type, transmission capacity, burial depth, and proximity to other cables. Substantial structural changes in habitats associated with cables are not expected unless cables are left unburied (See below). However, the cable burial process may alter sediment composition along the corridor, thereby affecting infauna and emergent biota. Taormina et al. (2018) provide a recent review of various cable impacts, and Hutchinson et al. (2020) and Taormina et al. (2020) examine the effects of electromagnetic fields in particular.

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

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape.[20] Temporary, acute, noise impacts from construction activity could impact reproductive behavior and migration patterns; the long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015; 2016; Madsen et al. 2006; Nowacek et al. 2007; NRC 2000; 2003; 2005; Piniak 2012; Popper et al. 2014; Richardson et al. 1995; Thomsen et al. 2006). Exposure to underwater noise can directly affect species via behavioral modification (avoidance, startle, spawning) or injury (sound exposure resulting in internal damage to hearing structures or internal organs; Bailey et al. 2014; Bailey et al. 2010; Bergström et al. 2014; Ellison et al. 2011; Ellison et al. 2018; Forney et al. 2017; Madsen, et al. 2006; Nowacek, et al. 2007; NRC 2003; 2005; Richardson, et al. 1995; Romano et al. 2004; Slabbekoorn et al. 2010; Thomsen, et al. 2006; Wright et al. 2007). Indirect effects are likely to result from changes to the acoustic environment of the species, which may affect the completion of essential life functions (e.g.,

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likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat."

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

migrating, breeding, communicating, resting, foraging; Forney, et al. 2017; Richardson, et al. 1995; Slabbekoorn, et al. 2010; Thomsen, et al. 2006).[21]

Wind farm survey and construction activities and turbine/cable placement will substantially affect NMFS scientific research surveys, including stock assessment surveys for fisheries and protected species[22] and ecological monitoring surveys. Disruption of such scientific surveys could increase scientific uncertainty in survey results and may meaningfully affect NMFS' ability to monitor the health, status, and behavior of marine resources and protected species and their habitat use within this region. Based on existing regional Fishery Management Councils' acceptable biological catch control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and recreational harvest limits that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower associated fishing revenue and reduced recreational fishing opportunities, which could result in indirect negative impacts on fishing communities. It is possible that new survey technologies will be developed that mitigate these impacts, but it is uncertain whether they will be developed, and (or) how quickly they can be adopted. NOAA and BOEM published a survey mitigation strategy in December 2022.[23] In May 2024, draft survey mitigation plans for the NEFSC long-term, recurring Northeast fisheries and ecosystem surveys were reviewed by a panel of Scientific and Statistical Committee members from the New England and Mid-Atlantic Fishery Management Councils.

Impacts of Offshore Wind Energy Development on Social and Economic Resources

Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Massachusetts to North Carolina (Map 9). According to BOEM, about 22 gigawatts (close to 2,000 wind turbines based on current technology) of Atlantic offshore wind development via 17 projects are reasonably foreseeable along the east coast (BOEM 2020b). Offshore wind energy development is well underway within the lease areas off Rhode Island and Massachusetts. The monkfish and spiny dogfish fisheries have been active in the Massachusetts/Rhode Island and Mid-Atlantic lease areas and are expected to be for the near future. As of April 2024, two projects, South Fork Wind (12 turbines) and Vineyard Wind 1 (62 turbines), have construction well underway. Revolution Wind was permitted by BOEM during 2023 and construction began in May 2024. Permits were also issued for Sunrise Wind (Rhode Island) and New England Wind (formerly Vineyard Wind South). Other projects in the New England area are earlier in the site assessment and planning phases. NEFMC recommended a Habitat Area of Particular Concern overlapping the Southern New England lease areas to promote conservation of cod spawning grounds and complex benthic habitats. A final rule on this measure was published in February 2024.

Further south, Empire Wind (New York) was permitted in 2023 and had its Construction and Operations Plan approved by BOEM in February 2024, but construction has not yet begun; Ocean Wind 1 was initially permitted, however, BOEM approved a two-year suspension of the operations term of Ocean Wind LLC's commercial lease on February 29, 2024. Other projects in the mid-Atlantic are also under development. Two new lease areas were announced in the Central Atlantic in December 2023, one off Delaware/Maryland, and one off Virginia. These lease areas will be auctioned in August 2024. In the New York Bight, there are six wind lease areas; a Programmatic Environmental Impact Statement is being developed in 2024. Some east coast offshore wind projects, including New England Wind (formerly Vineyard Wind South, formerly Commonwealth Wind and Park City Wind), Revolution Wind II, Empire Wind I and II, Beacon Wind, Sunrise Wind, and Ocean Wind II are seeking new power

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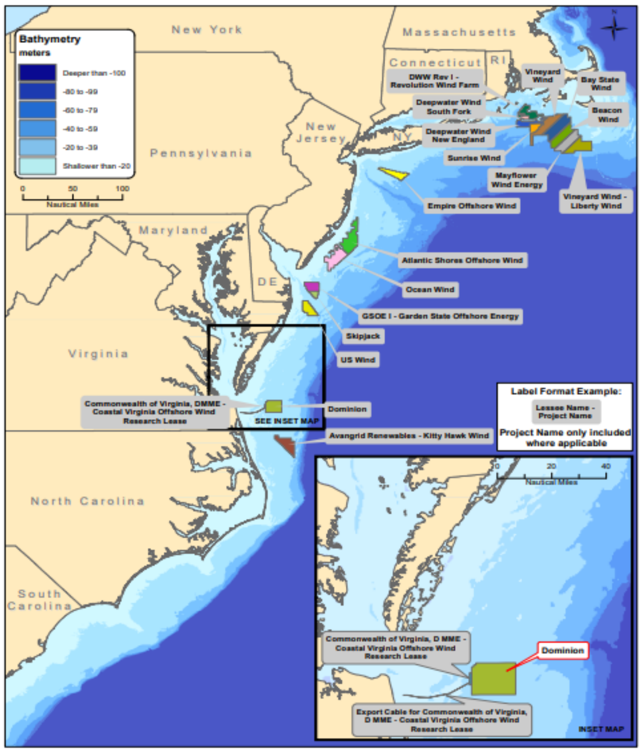
[21] See NMFS Ocean Noise Strategy Roadmap (footnote #2)

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

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

purchase agreements (PPAs) as of July 2024, which lends uncertainty to the construction timelines for these projects, even for those already permitted. In addition, on April 19, 2024, the third offshore wind solicitation in NY concluded with no final awards being made due to the inability to secure the expected 18 MW offshore wind turbines, further adding to the timing uncertainty for offshore wind development in these areas. Other states have ongoing solicitations.

Map 9. Active commercial and research renewable energy lease areas on the outer continental shelf. Source: BOEM.



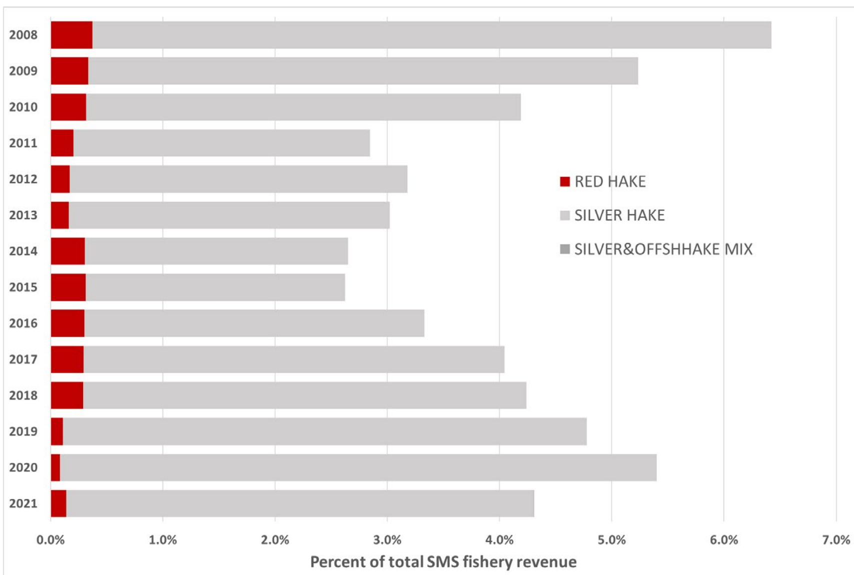
BOEM recently began a planning process for the Gulf of Maine via a regional intergovernmental renewable energy task force (https://www.boem.gov/Gulf-of-Maine). BOEM announced the final wind energy areas in the Gulf of Maine on March 15, 2024 and a proposed sale notice on April 30, 2024 which included eight lease areas off of Maine, Massachusetts, and New Hampshire. Final lease areas are expected late summer 2024, with lease issuance by the end of 2024. Given the water depth in the region, floating turbines will likely be the primary type of wind turbine foundations to be deployed. It is unclear where development might occur in the Gulf of Maine, though the proposed lease areas do not appear to overlap with small-mesh fishing areas (Map 10).

The social and economic impacts of offshore wind energy on fisheries could be generally negative due to the overlap of wind energy areas with productive small-mesh species fishing grounds. Impacts may vary by year and species availability. However, there could be some social and economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable resources (AWEA 2020).

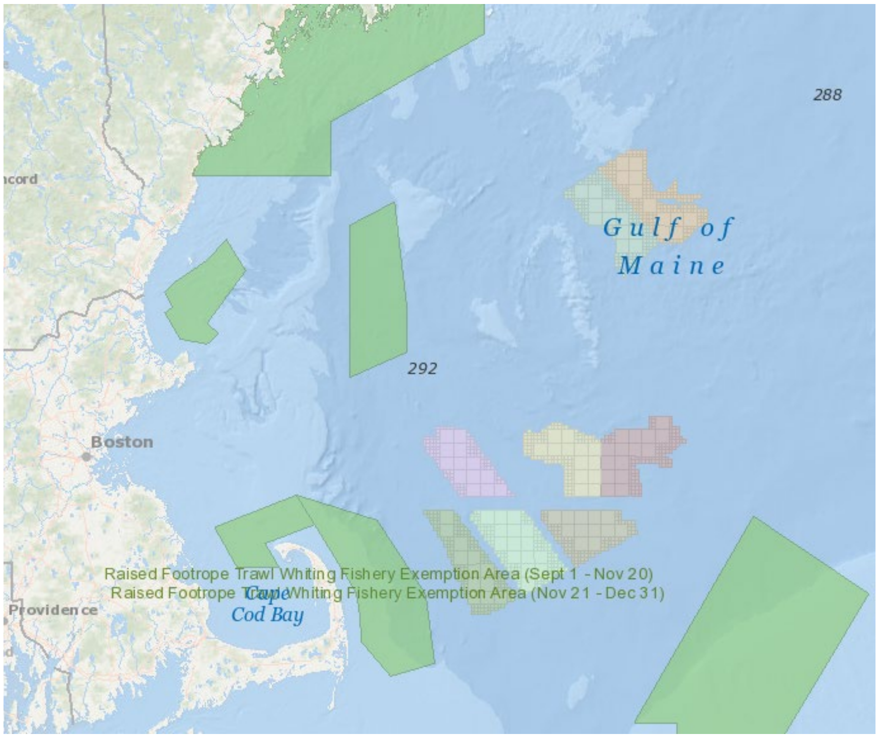
From 2008 to 2021, the percentage of small-mesh multispecies fishery revenue estimated to come from fishing within wind energy lease areas ranged from 2.5 to 6.4 percent (Figure 13). While this is a relatively low fraction of total revenue (ranging from $9.4 to $11.2 million), the loss of the fishing grounds will be impactful on subsets of fishermen, particularly those originating from nearby ports.

Vessels losing access due to wind farms and associated infrastructure siting could fish for small-mesh multispecies and other stocks elsewhere, increasing the localized impacts in alternative areas where fishing increases. Citing wind farms or other man-made structures within Gulf of Maine exemption areas could be particularly impactful, because small-mesh multispecies would have few alternative places to fish unless the Council modified the exemption regulations. Presently, the Proposed Sale Notice lease areas in the Gulf of Maine do not overlap with the small-mesh multispecies exemption areas in Map 10 or the Cultivator Shoals Area on the northern portion of Georges Bank. Thus, at present, the Proposed Sale Notice lease areas in the Gulf of Maine will have minimal impacts on the small-mesh multispecies fishery, assuming that other displaced fisheries do not shift into these areas to fish for other species. Reductions in fishing grounds elsewhere may however increase the incentive to fish for small-mesh multispecies in the Gulf of Maine exemption areas if fish prices are sufficient. Map 12 shows the distribution of red and silver hake fall survey biomass overall, which may be considered for a small-mesh exemption if displacement occurs, provided that associated bycatch of regulated groundfish is acceptably low and there are no alarming protected species impacts, or other concerns.

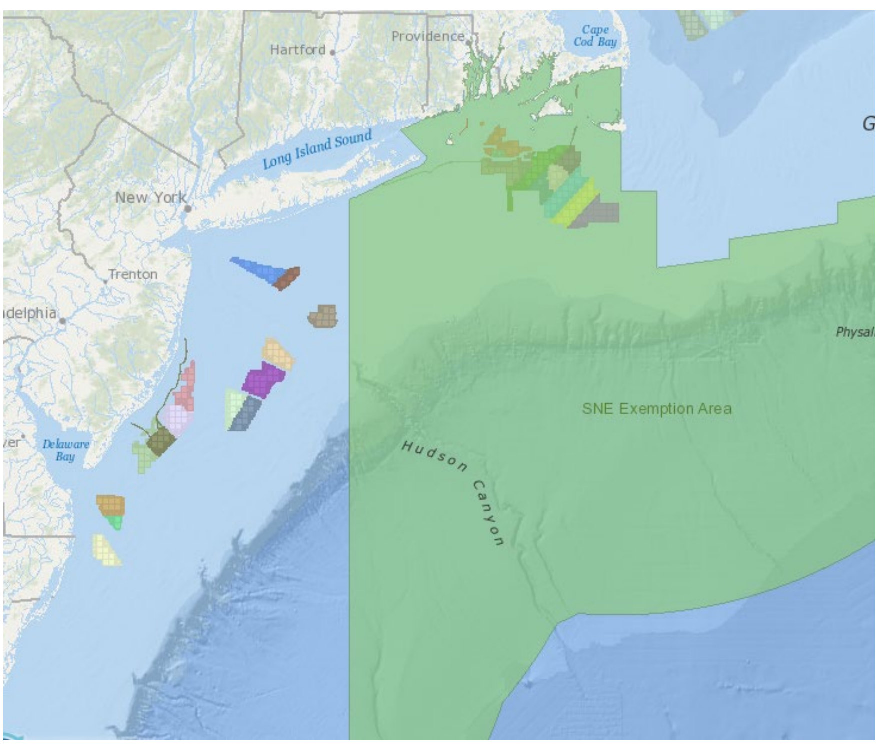
Figure 13. Percent of small-mesh multispecies fishery revenue derived from within the boundaries of wind energy lease areas. Source data from NOAA/NMFS/GARFO Socioeconomic Impacts of Atlantic Offshore Wind Development 11/15/22



Map 10. Gulf of Maine Proposed Sale Notice lease areas in relation to small-mesh multispecies exemption areas (shaded lime green). Source: Northeast Ocean Data portal, 7/16/2024.



Map 11. Offshore Wind Active Renewable Energy Lease Areas in Southern New England and the Mid-Atlantic in relation to small-mesh exemption areas (shaded green). Source: Northeast Ocean Data Portal, 7/16/2024.



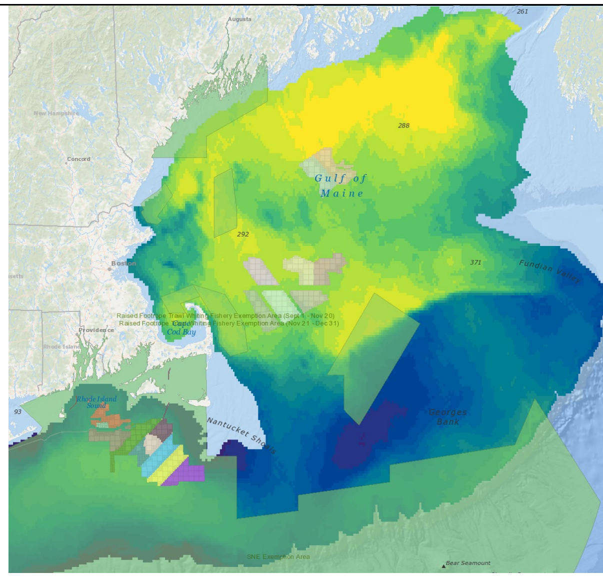
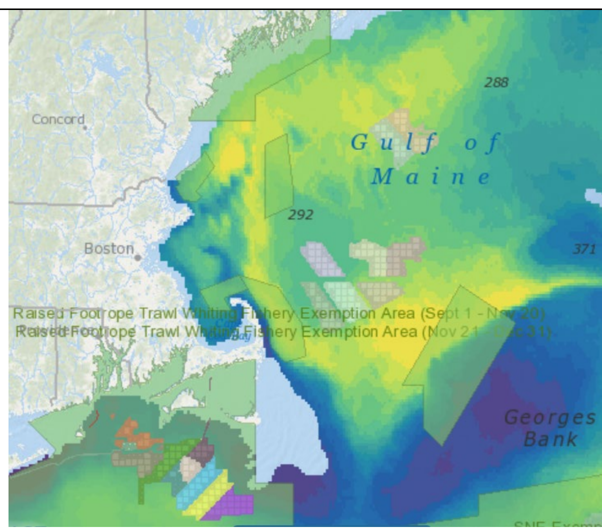
It remains unclear exactly how fishing or transiting to and from fishing grounds might be affected by the presence of a wind farm. While no offshore wind developers have expressed an intent to exclude fishing vessels from wind turbine arrays once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing and orientation of the array and weather conditions. The U.S. Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (USCG 2020). If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative social and economic impacts to affected communities, including increased user conflicts, decreased catch and associated revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind farms, effects could be negative due to reduced catch and associated revenue, user conflicts, gear damage/loss, and increased risk of allision or collision.

As the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities. Development of these areas may cause regional changes to fishing practices which could cause indirect effects on the groundfish resource and fishery. Overall, this analysis represents only a rough approximation of potential negative and positive effects from offshore wind energy development.

Offshore Energy Summary

The overall impact of offshore wind energy and oil and gas exploration on the affected species and their habitats at a population level is unknown, but likely to range from no impact to moderate negative, depending on the number and locations of projects that occur. Map 12 illustrates the relationship between the distribution of small-mesh multispecies stock biomass and wind lease areas. The individual project phases (site assessment, construction, operation, and decommissioning) as well as different aspects of the technology (foundations, cables/pipelines, turbines) will have varying impacts on resources. Mitigation efforts, such as habitat conservation measures, time of year construction restrictions, layout modifications, and fishery compensation funds could lessen the magnitude of negative impacts as well. The overall impact on social and economic resources is likely slight positive to moderate negative; potentially positive due to a potential increase in jobs and recreational fishing opportunities, but negative due to displacement and disruption of commercial fishing effort.

Map 12. NEFSC fall survey biomass for silver and red hake, 2010-2019, and small-mesh exemption areas (shaded green), with wind lease areas and Gulf of Maine Proposed Sale Notice Lease Areas. Map generated from [Northeast Ocean Data Portal](), 7/24/24 and 7/17/2024.

Silver hake

Red hake


6.7.2.2.2 Global Climate Change

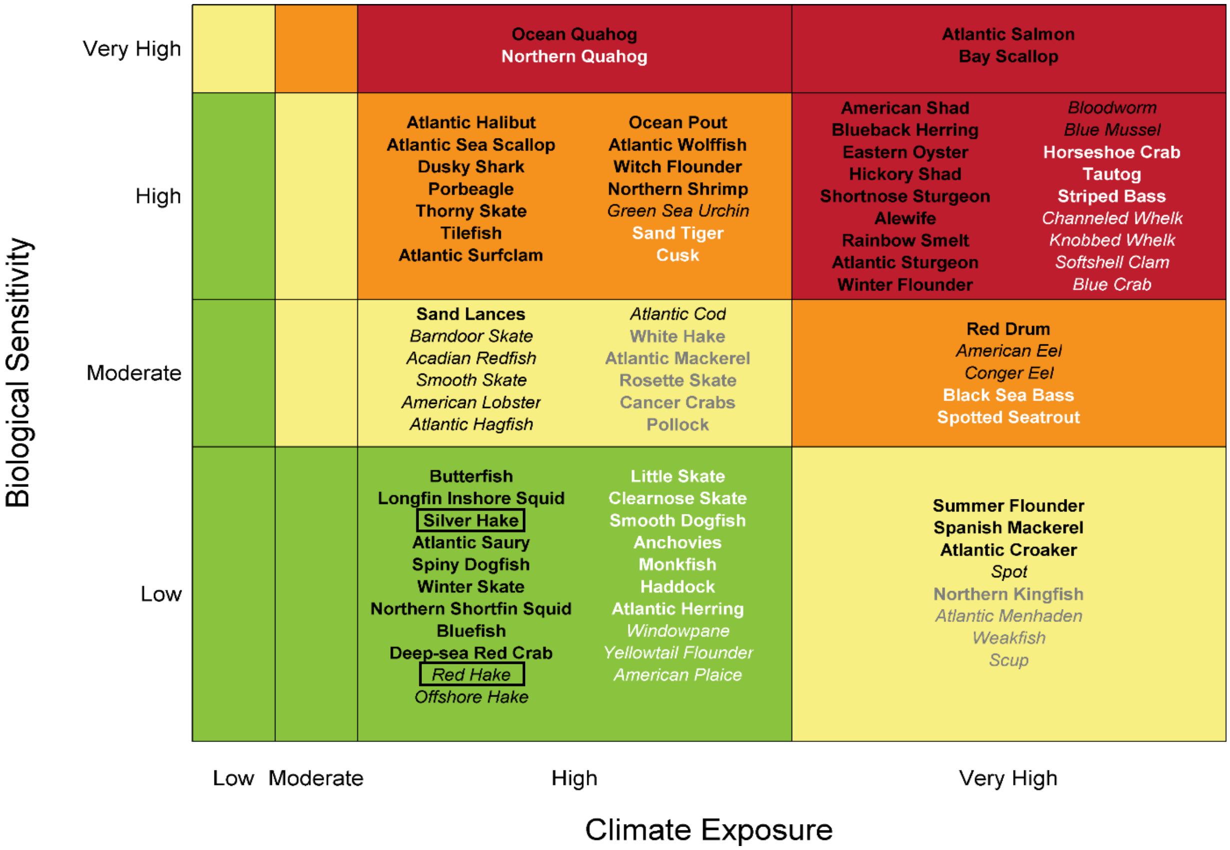
Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity and duration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

Results from the Northeast Fisheries Climate Vulnerability Assessment indicate that climate change could have impacts on Council-managed species that range from negative to positive, depending on the adaptability of each species to the changing environment (Hare et al. 2016) and how species productivity changes in the face of the changing environment..

Overall vulnerability results for additional Greater Atlantic species, including most of the non-target species identified in this action, are shown in Figure 14 (Hare, et al. 2016). Based on this assessment, both silver and red hake scored as having low biological sensitivity to climate change (Figure 14).

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

Figure 14. Overall climate vulnerability score for Greater Atlantic species, with small-mesh multispecies highlighted with black boxes.



Note: Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90–95%, black, italic font), moderate certainty (66–90%, white or gray, bold font), low certainty (<66%, white or gray, italic font).
Source: Hare et al. (2016).

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

The CEA baseline conditions for resources and human communities are the combined effects of the past, present, and foreseeable future actions (Section 6.7.2) plus the present condition of the VECs (Section 5.0). Straightforward quantitative metrics of the baseline conditions are available for the managed resources, non-target species, and protected resources. The conditions of the habitat and human communities VECs are complex and varied (Sections 5.5 and 5.6, respectively).

Table 35. Baseline conditions of the VECs.

VEC		Status/Trends (Section 5.0)	Effects of Past, Present Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
		A	B	A+B
Target Species (Northern red hake, southern red hake, northern silver hake, southern whiting)		Silver hake, southern whiting, and northern red hake stocks are not overfished and overfishing is not occurring. The status of southern red hake is unknown because biological reference points are not available. The stock biomass is at moderately low levels relative to past conditions.	**Positive** Stocks are being managed for sustainability. Measures are in place to increase the potential for increases in southern red hake stock biomass and rebuilding.	**Long-term Positive**: stocks are being managed for sustainability and adjustments are being made to help prevent overfishing and rebuild southern red hake biomass.
Non-target Species		Effort controls in the small-mesh multispecies fishery help control bycatch / discards.	**Positive** Continued effort controls under the small-mesh multispecies FMP and other FMPs with overlapping effort	**Positive** Discards also controlled in other FMPs
Protected Species	**Sea Turtles**	Endangered or threatened	**Mixed** Continued effort and associated fishery regulations along with past regulations will likely help stabilize protected species interactions.	**Mixed** Continued catch and associated fishery regulations are likely to reduce gear encounters through restrictions on fishing effort such as exemption area boundaries, seasons, and gear restrictions. Additional management actions taken under ESA/MMPA should also help mitigate the risk of gear interactions.
	Large Whales	Endangered or MMPA protected		
	Small Cetaceans and Pinnipeds	MMPA protected		
	Giant Manta Ray	Threatened		
	Atlantic Sturgeon	Endangered or threatened		
	Atlantic Salmon	Endangered		
	Seabirds	Low-high conservation concern		

VEC	Status/Trends (Section 5.0)	Effects of Past, Present Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Physical Environment and Essential Fish Habitat	Fishing impacts are complex/variable and typically adverse; Non-fishing activities have had negative but site-specific habitat effects	**Mixed** Continued management of EFH for an increased quality of habitat but non-fishing impacts expected to increase	**Mixed** Reduced habitat disturbance by fishing gear impacts from non-fishing activities could increase and have negative impact
Human Communities	Small-mesh multispecies revenues have been relatively stable and are unlikely to change substantially with changes in specifications.	**Positive** Continued management will likely control catch for a sustainable fishery and thus fishery and non-fishery related activities will continue.	**Short- and Long-term Positive**: Sustainable resources should support viable communities and economies.

6.7.4 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative impacts of the preferred alternatives, the incremental impacts of the direct and indirect impacts should be considered, on a VEC-by-VEC basis, in addition to the effects of all actions (those identified and discussed relative to the past, present, and reasonably foreseeable future actions of both fishing and non-fishing actions). Table 1 provides a summary of likely impacts found in the various groups of management alternatives contained in this action. The CEA baseline that, as described above in Table 35 represents the sum of past, present, and reasonably foreseeable future actions and conditions of each VEC. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with “other” actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC. As in Section 6.7.2.2, non-fishing impacts on the VECs generally range from no impact to slight negative.

Table 36. Incremental impacts of the proposed action. The preferred alternative is shaded.

Proposed Action	Alternative	Target Species	Non-target Species	Protected Species	Physical Environment & Essential Fish Habitat	Human Communities
FY 2024-2026 Specifications	**No Action**	Positive for northern silver hake and southern red hake; slight positive for northern red hake; moderate negative for southern whiting	Slightly negative to slightly positive impacts	Negligible to slight negative impacts for ESA-listed species; negligible to slight positive impacts for non-ESA-listed/MMPA protected species	Slightly negative impact, but negligible change relative to other alternatives	Negligible to slight positive economic impact, negligible to slight negative social impact
	Alternative 2 Option 1	Slightly positive for all stocks overall. All specification adjustments account for biomass changes to achieve optimum yield and prevent overfishing.	Slightly negative to slightly positive impacts	Negligible to slight negative impacts for ESA-listed species; slight negative to slight positive impacts for non-ESA-listed/MMPA protected species. Negligible impacts compared to No Action and Option 2.	Slightly negative impact, but negligible change relative to other alternatives	Slight positive economic and social impacts

Proposed Action	Alternative	Target Species	Non-target Species	Protected Species	Physical Environment & Essential Fish Habitat	Human Communities
	Alternative 2, Option 2	Slightly positive for all stocks overall. All specification adjustments account for biomass changes to achieve optimum yield and prevent overfishing.	Slightly negative to slightly positive impacts.	Negligible to slight negative impacts for ESA-listed species; slight negative to slight positive impacts for non-ESA-listed/MMPA protected species. Negligible impacts compared to No Action and Option 2.	Slightly negative impact, but negligible change relative to other alternatives	Slight positive economic and social impacts

6.7.4.1 Target Species (*small-mesh multispecies)*

Past fishery management actions taken through the Northeast Multispecies FMP (Small-Mesh Multispecies) and the triennial specifications process ensure that stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts of triennial specification of management measures largely depend on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures (e.g., incidental possession limits, AMs) are effective. These actions have generally had a mixed cumulative effect on small-mesh multispecies. Overall, the past, present, and reasonably foreseeable future actions on small-mesh multispecies have had slightly negative to positive cumulative effects.

As noted in Section 6.2, the preferred alternative is unlikely to substantially change levels of fishing effort and behavior, but is expected to have slightly positive effects on the small-mesh multispecies resource (see table above). The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on the target species by achieving the objectives specified in the FMP.

When the direct and indirect effects of the preferred alternative are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects would likely yield non-significant slightly positive impacts on the small-mesh multispecies stocks.*

6.7.4.2 Non-Target Species

The combined impacts of past federal fishery management actions on non-target species have been mixed, as decreased effort and reduced catch of non-target species continue, though some stocks are in poor status. Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species. As noted in Section 6.3, the proposed action would likely continue this trend. Future actions are anticipated to continue rebuilding non-target species stocks and limit the take of incidental/bycatch in the small-mesh multispecies fishery, particularly through mitigation measures such as the area exemption program. Catches of non-target species in the small-mesh multispecies fishery is also monitored and controlled through other FMPs. Continued management of directed stocks will also control catch of non-target species.

The preferred alternative is unlikely to cause substantially higher levels of fishing effort or change in behavior relative to current conditions (Section 6.3). Therefore, impacts of the fishery on non-target species are not expected to change relative to the current condition under the proposed action (i.e., slight positive for non-target species that are not overfished, slight negative for overfished non-target species). The proposed actions in this document would positively reinforce past and anticipated cumulative effects on non-target species by achieving the objectives in the FMP.

When the direct and indirect effects of the preferred alternative are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects would likely yield non-significant slightly positive (non-overfished species) to slightly negative (overfished species) impacts on non-target species.*

6.7.4.3 Protected Resources

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

Numerous protected species (ESA listed and/or MMPA protected) occur in the Northwest Atlantic. The distribution and status of those species in the region are described in Section 5.4. Depending on species and status, the population trends for these protected resources are variable.

Taking into consideration the above information, past fishery management actions taken through the respective FMPs and annual specifications process have had slight indirect positive cumulative effects on protected species. The actions have constrained fishing effort both at a large scale and locally, and have implemented, pursuant to the ESA, MMPA, or MSA, gear modifications, requirements, and management areas. These measures and/or actions have served to reduce interactions between protected species and fishing gear. It is anticipated that future management actions, described in Section 6.7.2.1 will result in additional indirect positive effects on protected species. These impacts could be broad in scope.

The preferred alternatives would not substantially modify current levels of fishing effort in terms of the overall amount of effort, timing, and location. They would allow existing fishing effort to continue. As described in Section 6.4, the preferred alternative is expected to have impacts on protected species that range from slight negative to slight positive, depending on the species.

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

6.7.4.4 Physical Environment/Habitat/EFH

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

Many additional non-fishing activities, as described in Section 6.7.2.2, are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. These impacts could be broad in scope. All the VECs are interrelated; therefore, the linkages among habitat quality, managed resources and non-target species productivity, and associated fishery yields should be considered. Some actions, such as coastal population growth and climate change may indirectly impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management. Reductions in overall fishing effort and protection of sensitive habitats have mitigated some negative effects.

As noted previously in Section 6.4.1, none of the preferred alternatives are expected to result in substantially higher levels of fishing effort or changes to the character of that effort relative to current conditions. Although the impacted areas have been fished for many years with many different gear types and therefore will not likely be further impacted by these measures, continued fishing effort will continue to impact habitats. Therefore, the impacts of the fishery on the physical environment are not expected to change relative to the current condition under the preferred alternatives (i.e., slight negative for physical environment).

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

6.7.4.5 Human Communities

Past fishery management actions taken through the Small-Mesh Multispecies FMP have had both positive and negative cumulative effects on human communities. They have benefitted domestic fisheries through sustainable fishery management but can also reduce participation in fisheries. The impacts from specification of management measures are largely dependent on how effective those measures are in meeting their intended objectives and the extent to which mitigating measures are effective.

It is anticipated that the future management actions described in Section 6.7.2.1 will result in positive effects for human communities due to sustainable management practices and opportunities to realize higher total income because small-mesh multispecies stocks are at or above management targets, although additional indirect negative effects on some human communities could occur if management actions result in reduced revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects. Positive long-term effects are expected due to the long-term sustainability of the managed stocks.

By providing revenues and contributing to the overall functioning of and employment in coastal communities, the small-mesh multispecies fishery has both direct and indirect positive social impacts. As described in Section 6.6, the preferred alternatives are unlikely to result in substantial changes to levels of fishing effort or the character of that effort relative to current conditions. Through implementation of this action, the Council seeks to achieve the primary objective of the MSA, which is to achieve OY from the managed fisheries.

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

6.7.5 Proposed Action on all the VECs

The Council's preferred alternative (i.e., the proposed action) is described in Section 4.0. The direct and indirect impacts of the proposed action on the VECs are described in Sections 6.2 to 6.5 and are summarized in the Executive Summary (Section 1.0). The magnitude and significance of the cumulative effects, including additive and synergistic effects of the proposed actions, as well as past, present, and future actions have been taken into account (Section 6.7.4).

When considered in conjunction with all other pressures placed on the fisheries by past, present, and reasonably foreseeable future actions, the preferred alternative is not expected to result in any significant impacts, positive or negative. The impacts of the alternatives described in Section 4.0 and analyzed in Section 6.0 are generally slightly negative to slightly positive, mainly because the amount of fishing effort is unlikely to substantially change, though the changes in specifications could provide an opportunity to increase or shift fishing effort for various species.

The preferred alternative is consistent with other management measures that have been implemented in the past for the small-mesh multispecies fishery and is part of a broader management scheme for the multispecies fishery. This management scheme has helped to reduce the risk of overfishing, correct for overfishing when it has occurred, and thus ensure long-term sustainability, while minimizing environmental impacts.

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

There are no significant cumulative effects associated with the preferred alternatives based on the information and analyses presented in this document and in past FMP documents (Table 37). Cumulatively, through 2026, it is anticipated that the preferred alternatives will result in non-significant impacts on all VECs, ranging from slight negative to slight positive.

Table 37. Summary of cumulative effects of the preferred alternatives.

	Target Species	Non-Target Species	Protected Resources	Habitat	Human Communities
Direct/Indirect Impacts of Preferred Alternative	Slight positive	Slight negative to slight positive	Slight negative to slight positive	Slight negative	Slight positive
Combined Cumulative Effects Assessment Baseline Conditions	Slight positive	Slight negative to slight positive	Slight negative to slight positive	Slight negative	Slight positive
Cumulative Effects	Slight positive	Slight negative to slight positive	Slight negative to slight positive	Slight negative	Slight positive

7.0 APPLICABLE LAWS/EXECUTIVE ORDERS

7.1 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

7.1.1 National Standards

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

National Standard 1. The proposed action is consistent with National Standard 1, because it will likely prevent overfishing while achieving optimum yield for managed species and the U.S. fishing industry on a continuing basis. This action adjusts management measures to maximize optimum yield while preventing overfishing, while achieving optimum yield for managed species and the U.S. fishing industry on a continuing basis. The primary goal of managing the small-mesh multispecies fishery is to maintain long-term sustainable catch levels and the first objective of the Northeast Multispecies FMP is to prevent overfishing. The Northeast Multispecies FMP established a fishery specifications process that ensures a consistent review of the small-mesh multispecies stock status, fishery performance, and other factors to manage by annual catch limits (ACLs) and prevent overfishing (also see NEFMC 2020c). The measures implemented through this action should further achieve the goals/objectives and reduce the possibility of overfishing the small-mesh multispecies resource.

The Council continues to meet the obligations of National Standard 1 by adopting measures designed to end overfishing on the southern red hake stock that was declared overfished in January in 2018 and to minimize the risk that northern red hake, northern silver hake, or southern whiting become overfished. As of the 2023 Assessment (NEFSC 2023c,e) the northern silver hake and southern whiting are currently not overfished, and overfishing is not occurring (Section 5.2). The overfishing and overfished statuses for red hake are unknown, though northern red hake is likely not overfished and overfishing is not occurring. Southern red hake stock biomass is currently near the overfished threshold, and the stock is in a rebuilding plan (NEFMC 2021b).

National Standard 2. The proposed action is consistent with National Standard 2, because it was informed by the most recently available fisheries-independent data from several surveys, commercial fishery landings data, stock assessments, and other scientific data sources. The proposed 2024-2026 small-mesh multispecies specifications are supported by the latest available scientific information, and recommendations for silver and red hake catch during FY 2024-2026 are based on advice from the Council's SSC. Specifically, this action was informed by fisheries-independent data from several surveys, commercial fishery landings data, stock assessments, and other scientific data sources (see NEFMC 2020c). The supporting science and analyses, upon which the proposed action is based, are summarized and described in Sections 5.0 and 6.0 of this document.

National Standard 3. The proposed action is consistent with National Standard 3, because small-mesh multispecies are managed throughout their ranges. In addition, the small-mesh multispecies fishery management measures are designed and evaluated for their impact on the fishery as a whole. State-water landings are a minor part of total catch of small-mesh multispecies, but are accounted for by deducing the landings from the Annual Catch Limit (ACL) to determine the Federal Total Allowable Landings (TAL) and state-water discards are taken into account by the estimated discard rate that is deducted from the ACL to determine the Federal TAL. Offshore hake are not assessed, but are managed by the FMP and included in the southern whiting specifications at an average 4% rate that had been estimated by previous stock assessments. Offshore hake are rarely landed as an identified species and are mixed with landings of silver hake, collectively called "whiting".

National Standard 4. The proposed action is consistent with National Standard 4, because the measures apply equally to permit holders of the same category regardless of homeport or residence and therefore do not discriminate among residents of different states. The proposed 2024-2026 small-mesh multispecies fishery specifications allocate the stock-wide silver and red hake ACLs to management areas in a manner that is intended to maximize opportunities for the fishery while minimizing the potential for overfishing.

National Standard 5. The proposed action is consistent with National Standard 5, because it promotes efficiency in the use of fishery resources through appropriate measures intended to provide access to the small-mesh multispecies fishery for both current and historical participants while minimizing the race to fish, and the management measures do not have economic allocation as their sole purpose. The proposed 2021-2023 fishery specifications allocate the stock wide small-mesh multispecies ACLs to management areas in a manner that is intended to maximize opportunities for the fishery while minimizing the potential for overfishing. The specifications proposed in this document should promote efficiency in the use of fishery resources through appropriate measures intended to provide access to the small-mesh multispecies fishery for both current and historical participants while minimizing the race to fish in any of the small-mesh multispecies management areas, and they do not have economic allocation as their sole purpose.

National Standard 6. The proposed action is consistent with National Standard 6, because it accounts for variations in the fishery. The 2023 management track stock assessments for all four small-mesh multispecies stocks were the basis for the proposed specification adjustments. There are several factors which could introduce variations into the small-mesh multispecies fishery, and there is some uncertainty in the estimate of current stock biomass and in recent recruitment. Variable catches of offshore hake also add uncertainty about the relationship between southern silver hake catch and exploitation on the stock. Offshore catches are however a minor fraction of southern whiting catch and landings which are accounted for by a 4% adjustment to the southern whiting specifications. Furthermore, market fluctuations, environmental factors, and predator-prey interactions constantly introduce additional variations among, and contingencies in, the small-mesh multispecies resources, the fishery, and the available catch. These specifications intend to balance the needs of the small-mesh multispecies fishery while accounting for the documented changes in small-mesh multispecies biomass levels.

National Standard 7. The proposed action is consistent with National Standard 7, because the Council considered the costs and benefits associated with the proposed 2024-2026 small-mesh multispecies fishery specifications. Any costs incurred resulting from the management action proposed in this document are necessary to achieve the goals and objectives of the Northeast Multispecies FMP and are expected to be outweighed by the benefits of taking the management action. Consistent with National Standard 7, the management measures proposed in this document are not duplicative and were developed in close coordination with NMFS other interested entities and agencies to minimize duplicity.

National Standard 8. The proposed action is consistent with National Standard 8, because the importance of fishery resources to fishing communities is considered and the action allows their sustained participation while minimizing adverse economic impacts. A description of the fishing communities participating in and depending on the small-mesh multispecies fishery is in Section 5.6. Relative to the No Action alternative, the measures proposed are expected to have slight positive impacts on communities that engage in and depend on the small-mesh multispecies fishery. In the long-term, communities dependent on the small-mesh multispecies resource are expected to be sustained by this action because it manages the small-mesh multispecies resource in a precautionary manner to ensure long-term sustainable catch.

National Standard 9. The proposed action is consistent with National Standard 9, because it is not expected to substantially change bycatch levels of non-target species. Section 5.3 has comprehensive information related to bycatch in the small-mesh multispecies fishery. The primary non-target species in this fishery are spiny dogfish, butterfish, and little skate, all of which are managed and not overfished. These three stocks account for 22% of the 5,639 mt of total bycatch, a decline of 29% from the estimated 2017-2019 bycatch in the small-mesh multispecies fishery. Estimated bycatch of silver and red hake account for 26% of total bycatch in the small-mesh multispecies fishery, a decline of 44% compared to 2017-2019 silver and red hake bycatch. The measures in place in the fishery include exemption areas and seasons as well as requirements for selective gear (mesh restrictions and raised footrope trawl requirements) to minimize bycatch to the extent practicable while still allowing an opportunity to achieve OY. The preferred alternatives are not expected to have any major impact on bycatch of red, silver, or offshore hakes, or other species.

National Standard 10. The proposed action is consistent with National Standard 10, because none of the measures are expected to create unsafe conditions and situations at sea. The Council has the utmost concern regarding safety and understands how important safety is when considering allocations for the stock wide small-mesh multispecies ACLs to the individual management areas. The proposed 2024-2026 specifications ensure that access to the small-mesh multispecies fishery is provided for vessels of all sizes and gear types.

7.1.2 Other MSA Requirements

The Northeast Multispecies FMP contains the fourteen provisions required by Section 303 (a) of MSA.

1. *Contain the conservation and management measures, applicable to foreign fishing …*

   Foreign fishing is not allowed under the Northeast Multispecies management plan or this action, so specific measures are not included to specify and control allowable foreign catch. The proposed action is designed to prevent overfishing and rebuild overfished stocks by vessels of the U.S. consistent with the National Standards by implementing ACLs and ACTs for small-mesh multispecies. There are no international agreements that are germane to the management of small-mesh multispecies.

2. *Contain a description of the fishery …*

   An updated description of the fishery is included in the Small-Mesh Multispecies SAFE Report for Fishing Years 2020-2022 (NEFMC 2023) and in Section 5.6.

3. *Assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from the fishery …*

   The present and probable future condition of the small-mesh multispecies resource and estimates of MSY were updated through the most recent management track stock assessment in September 2023 (NEFSC 2023b,c,d,e). Information related to the stock assessments and the status of the stocks relative to approved biological reference points are summarized in Section 5.2.

4. *Assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); etc.*

   This MSA provision relates directly to the small-mesh multispecies specifications process and is addressed when the Council develops the specifications for the small-mesh multispecies fishery. Vessels that have been permitted to fish for small-mesh multispecies have the capacity to harvest optimum yield. Existing regulatory restrictions to manage large-mesh multispecies bycatch and limits on market demand limit catch. Due to market-related constraints on domestic and foreign demand for US landings and limits on fishery infrastructure, the vessels in the small-mesh multispecies fishery are fully capable of fulfilling this demand and may increase landings if these factors improve. The fishery is not limited by limited access restrictions and new US vessels may enter the fishery. Thus, there is no amount of OY available for foreign fishing.

5. *Specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery …*

   Data regarding the type and quantity of fishing gear used, catch by species, areas fished, season, sea sampling hauls, and domestic harvesting/processing capacity are updated in the Affected Environment (Section 5.6).

6. *Consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions …*

   The preferred alternatives do not alter any adjustments made in the Northeast Multispecies FMP that address opportunities for vessels that would otherwise be prevented from harvesting because of weather or other ocean conditions affecting safety aboard fishing vessels. Therefore, consultation with the U.S. Coast Guard was not required relative to this issue. The safety of fishing vessels and life at-sea is a high priority issue for the Council and was considered throughout the development of the approved management measures in Amendment 12 to this FMP (2000).

7. *Describe and identify essential fish habitat for the fishery …*

   Essential fish habitat has been identified for red, silver, and offshore hakes in the Small-Mesh Multispecies FMP and has been addressed through all subsequent related management actions in a manner consistent with the MSA. Amendment 12 updated the description of the physical environment and EFH (NEFMC 2000b) and evaluated the impacts on EFH of the preferred alternatives and other alternatives (Section 5.5). Nothing in this action changes those descriptions and evaluations.

8. *In the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

   Scientific and research needs are not required for specification adjustments. Current research needs are identified in Amendment 12 (NEFMC 2000b). Nonetheless, the NEFMC has a process that it evaluates research needs that apply to one or more NEFMC FMPs. A discussion of research needs in the fishery is included in stock assessments conducted by the NEFSC, characterized by the Council's SSC, and described in the Council's list of research priorities and data needs.

9. *Include a fishery impact statement for the plan or amendment …*

   Any additional impacts from measures proposed in this action are evaluated in Section 6.0.

10. *Specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished ...*

    Amendment 19 to the NE Multispecies FMP (NEFMC 2011) established criteria to determine whether the small-mesh multispecies stocks were either in an overfished condition, subject to overfishing, or both. This action does not change those criteria.

11. *Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery …*

    In 2015, NMFS approved a Standardized Bycatch Reporting Methodology (SBRM) amendment submitted by the Councils. This action does not include changes to this amendment.

12. *Assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish …*

Recreational catches are a very small proportion of total catches of red and silver hakes and are almost non-existent for offshore hake. As such, the catches are accounted for within the 5% allowance for management uncertainty but were estimated in the SAFE Report for Fishing Year 2020-2022 (NEFMC 2023), using estimation methods derived from the Marine Recreational Information Program (MRIP).

13. *Include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery ...*

    Amendment 19 as updated by the SAFE Report (NEFMC 2020b) provides a description of the commercial small-mesh multispecies fishery which is updated in Section 5.6. A description of the minor recreational catch of small-mesh multispecies is included.

14. *To the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.*

    The preferred alternatives do not allocate harvest restrictions or stock benefits to the fishery. Such allocations were adopted in Amendment 12 where any vessel may currently enter the fishery by obtaining a Multispecies Category K permit. Framework 62 (NEFMC 2021b) adjusts management measures for the southern red hake stock within the existing allocation structure to improve rebuilding potential but these measures apply equally to all vessels and future allocations when the stock is rebuilt do not favor any specific sector of fishing vessels.

15. *Establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.*

    The mechanism for establishing annual catch limits was adopted by Amendment 12 (2000). This action uses that mechanism to specify ACLs for future fishing years.

7.2 National Environmental Policy Act

The National Environmental Policy Act (NEPA) provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. The Council on Environmental Quality has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its policy and procedures for NEPA (NAO 216-6A). This EA applies CEQ's NEPA regulations currently in effect. See 50 C.F.R. § 1506.13.

7.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document as follows:

- The need for this action is in Section 3.2;
- The alternatives that were considered are in Section 4.0;
- The environmental impacts of the proposed action are in Section 6.0; and,
- The agencies and persons consulted on this action are in Sections 7.2.3.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An executive summary is in Section 1.0;

- A table of contents is in Section 2.0;
- Background and purpose are in Section 3.0;
- A summary of the document is in the executive summary, Section 1.0;
- A brief description of the affected environment is in Section 5.0;
- Cumulative impacts of the proposed action are in Section 6.7;
- A list of preparers is in Section 7.2.4.

7.2.2 Point of Contact

Questions concerning this document may be addressed to:

Dr. Catherine O'Keefe, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950 (978) 465-0492

7.2.3 Agencies Consulted

The following agencies were consulted in preparing this document:

- Mid-Atlantic Fishery Management Council
- New England Fishery Management Council, including representatives from:
  - Connecticut Department of Environmental Protection
  - Maine Department of Marine Resources
  - Massachusetts Division of Marine Fisheries
  - New Hampshire Fish and Game
  - Rhode Island Department of Environmental Management
- National Marine Fisheries Service, NOAA, Department of Commerce
- United States Coast Guard, Department of Homeland Security

7.2.4 List of Preparers

The following personnel participated in preparing this document:

- **New England Fishery Management Council**. Andrew Applegate (Small-mesh Multispecies Plan Coordinator), Naresh Pradhan, Emily Bodell, Chris Kellogg, and Dr. Cate O'Keefe
- **National Marine Fisheries Service.** Dr. Larry Alade, Dr. Jason Boucher, Toni Chute, Ashleigh McCord, Shannah Jaburek, Dan Caless, and Danielle Palmer
- **State agencies.** Nicole Lengyel-Costa (RI DEM) and Rebecca Peters (ME DMR)
- **Mid-Atlantic Fishery Management Council**. Jason Didden

7.2.5 Opportunity for Public Comment

This action was developed in 2023, and there were six public meetings related to this action (Table 38). Opportunities for public comment occurred at Advisory Panel/Committee and Council meetings. There were more limited opportunities to comment at PDT meetings. Meeting discussion documents and summaries are available at www.nefmc.org.

Table 38. Public meetings related to the FY 2024-2026 Specifications Adjustment.

Date	Meeting Type	Location
9/6	Whiting PDT	Webinar
9/25-9/28	Council	Plymouth, MA and Webinar
10/10	Whiting PDT	Webinar
10/27	Scientific and Statistical Committee	Boston, MA and Webinar
11/20	Whiting Advisory Panel/Committee	Warwick, RI
12/5-12/7	Council	Newport, RI and Webinar

7.3 Marine Mammal Protection Act (MMPA)

Section 6.4 contains an assessment of the impacts of the proposed action on marine mammals.

The New England Fishery Management Council has reviewed the impacts of the proposed 2024-2026 fishery specifications on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although the proposed actions may impact marine mammals occurring in the management unit of the small-mesh multispecies fishery, the specifications will not alter the effectiveness of existing MMPA measures to protect those species, and based on the overall reductions in fishing effort in the Small-Mesh Multispecies FMP, this action is not expected to impact marine mammals in any manner not considered in previous consultations on this fishery. A final determination of consistency with the MMPA will be made by the agency when this action is approved.

7.4 Endangered Species Act (ESA)

Section 7 of the ESA requires federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species and do not adversely affect designated critical habitat of listed species.

On May 27, 2021, the National Marine Fisheries Service's (NMFS) completed formal consultation pursuant to section 7 of the ESA of 1973, as amended, and issued a biological opinion (2021 Opinion) on the authorization of eight FMPs, two interstate fishery management plans (ISFMP), and the implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat (EFH) Amendment 2.[24] The 2021 Opinion considered the effects of the authorization of these FMPs, ISFMPs, and the implementation of the Omnibus EFH Amendment on ESA-listed species and designated critical habitat, and determined that those actions were not likely to jeopardize the continued existence of any ESA-listed species or destroy or adversely modify designated critical habitats of such species under NMFS jurisdiction. An Incidental Take Statement (ITS) was issued in the Opinion. The ITS includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

[24] The eight Federal FMPs considered in the May 27, 2021, Biological Opinion include: (1) Atlantic Bluefish; (2) Atlantic Deep-sea Red Crab; (3) Mackerel, Squid, and Butterfish; (4) Monkfish; (5) Northeast Multispecies; (6) Northeast Skate Complex; (7) Spiny Dogfish; and (8) Summer Flounder, Scup, and Black Sea Bass. The two ISFMPs are American Lobster and Jonah Crab.

On January 10, 2024, NMFS issued a 7(a)(2)/7(d) memorandum that reinitiated consultation on the 2021 Biological Opinion. The federal actions to be addressed in this reinitiation of consultation include the authorization of the federal fisheries conducted under the aforementioned eight federal FMPs (see footnote 24). The reinitiated consultation will not include American lobster and Jonah crab fisheries, which are authorized under ISFMPs. On December 29, 2022, President Biden signed the Consolidated Appropriations Act (CAA), 2023, which included the following provision specific to NMFS' regulation of the lobster and Jonah crab fishery to protect right whales, "Notwithstanding any other provision of law ... for the period beginning on the date of enactment of this Act and ending on December 31, 2028, the Final Rule ... shall be deemed sufficient to ensure that the continued Federal and State authorizations of the American lobster and Jonah crab fisheries are in full compliance with the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361 et seq.) and the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.)." Given this, the American lobster and Jonah crab fisheries remain in compliance with the ESA through December 31, 2028.

Based on our preliminary assessment of the proposed action, the Council has determined that the proposed action does not entail making any changes to the small-mesh multispecies fishery during the reinitiation period that would cause an increase in interactions with or effects to ESA-listed species or their critical habitat beyond those considered in NMFS' January 10, 2024, reinitiation memorandum. Therefore, this action is consistent with NMFS' January 10, 2024, 7(a)(2) determination.

7.5 Administrative Procedure Act (APA)

Sections 551-553 of the Administrative Procedure Act established procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process, and to give public notice and opportunity for comment. The Council did not request relief from notice and comment rule making for this action and expects that NOAA Fisheries will publish proposed and final rule making for this action.

7.6 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. It also ensures that the Government is not overly burdening the public with information requests. This action does not propose to modify any existing collections, or to add any new collections; therefore, no review under the Paperwork Reduction Act is necessary.

7.7 Coastal Zone Management Act (CZMA)

Section 307 of the Coastal Zone Management Act (CZMA) is known as the federal consistency provision. Federal Consistency review requires that "federal actions, occurring inside or outside of a state's coastal zone, that have a reasonable potential to affect the coastal resources or uses of that state's coastal zone, to be consistent with that state's enforceable coastal policies, to the maximum extent practicable." NOAA Fisheries has previously made determinations that the FMP was consistent with each state's coastal zone management plan and policies, and each coastal state concurred in these consistency determinations. Once the Council has adopted final measures and submitted this 2024-2026 Specifications Document to NMFS, NMFS will request consistency reviews by CZM state agencies directly.

7.8 Information Quality Act (IQA)

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies." OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity and objectivity. This section provides information required to address these requirements.

Utility of Information Product

The proposed 2024-2026 fishery specifications and management measures include: a description of the management issues to be addressed, statement of goals and objectives, a description of the proposed action and other alternatives/options considered, analyses of the impacts of the proposed specifications and other alternatives/options on the affected environment, and the reasons for selecting the preferred specifications. These proposed modifications implement the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act as well as all other existing applicable laws.

Utility means that disseminated information is useful to its intended users. "Useful" means that the content of the information is helpful, beneficial, or serviceable to its intended users, or that the information supports the usefulness of other disseminated information by making it more accessible or easier to read, see, understand, obtain or use. The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. The intended users of the information contained in this document are participants in the small-mesh multispecies fishery and other interested parties and members of the general public. The information contained in this document may be useful to owners of vessels holding a small-mesh multispecies permit as well as small-mesh multispecies dealers and processors since it serves to notify these individuals of any potential changes to management measures for the fishery. This information will enable these individuals to adjust their fishing practices and make appropriate business decisions based on the new management measures and corresponding regulations.

The information being provided in the 2024-2026 Specifications Document concerning the status of the small-mesh multispecies fishery is updated based on landings and effort information through FY 2022 when possible. Information presented in this document is intended to support the proposed specifications for FY 2024-2026, which have been developed through a multi-stage process involving all interested members of the public. Consequently, the information pertaining to management measures contained in this document has been improved based on comments from the public, fishing industry, members of the Council, and NOAA Fisheries.

Until a proposed rule is prepared and published, this document is the principal means by which the information herein is publicly available. The information provided in this document is based on the most recent available information from the relevant data sources, including detailed and relatively recent information on the small-mesh multispecies resource and, therefore, represents an improvement over previously available information. This document will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act and, therefore, may be improved based on comments received.

This document is available online through the NEFMC's web page (www.nefmc.org) and is available in printed form upon request. The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Greater Atlantic Regional Fisheries Office (www.greateratlantic.fisheries.noaa.gov), and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

Integrity of Information Product

Integrity refers to security – the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g. dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity of Information Product

Objective information is presented in an accurate, clear, complete, and unbiased manner, and in proper context. The substance of the information is accurate, reliable, and unbiased; in the scientific, financial, or statistical context, original and supporting data are generated and the analytical results are developed using sound, commonly accepted scientific and research methods. "Accurate" means that information is within an acceptable degree of imprecision or error appropriate to the kind of information at issue and otherwise meets commonly accepted scientific, financial, and statistical standards.

For purposes of the Pre-Dissemination Review, this document is a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the MSA; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing NEPA. This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Several data sources were used in the development of this action, including, but not limited to, historical and current landings data from the Commercial Dealer database, vessel trip report (VTR) data, At-sea Monitoring and Fishery Observer Program data, the Northeast Region Catch Accounting and Monitoring System (CAMS) for commercial catch estimates, the Marine Recreational Information Program (MRIP) for recreational catch estimates, and fisheries independent data collected through the NMFS bottom trawl surveys. The analyses herein were prepared using data from accepted sources and have been reviewed by members of the Small-Mesh Multispecies Plan Development Team and by the SSC where appropriate.

Despite current data limitations, the conservation and management measures considered for this action were selected based upon the best scientific information available. The analyses important to this decision used information from the most recent complete calendar years, generally through fishing year 2022 (ending on April 30, 2023). The data used in the analyses provide the best available information on the number of permits, both active and inactive, in the fishery, the catch (including landings and discards) by those vessels, the landings per unit effort (LPUE) and the revenue produced by the sale of those landings to dealers, as well as data about catch, bycatch, gear, and fishing effort from a subset of trips sampled at sea by government observers.

Specialists, including professional members of PDTs, technical teams, committees, and Council staff, who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the small-mesh multispecies fishery. The proposed action is supported by the best available scientific information. The policy choice is clearly articulated in Section 4.0, the management alternatives considered in this action.

The supporting science and analyses, upon which the policy choice was based, are summarized and described in the SAFE Report for Fishing Years 2020-2022 (NEFMC 2023) and Section 5.0. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency. The review process used in the preparation of this document involves the responsible Council, the NEFSC, GARFO, and NOAA Fisheries Service Headquarters. The NEFSC's technical review is conducted by senior-level scientists specializing in population dynamics, stock assessment, population biology, ecosystem science, economics, and social science.

The Council review process involves public meetings at which affected stakeholders have opportunity to comment on the document. Review by staff at GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. The Council also uses its SSC to review the background science and assessment results to recommend the Overfishing Limits (OFLs) and Allowable Biological Catch (ABCs), including the effects those limits would have on other specifications in this document. The SSC is the primary scientific and technical advisory body to the Council and is made up of scientists who are independent of the Council.

Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. In preparing this action for the Small-Mesh Multispecies FMP (a subset of the NE Multispecies FMP regulations), NMFS, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Information Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas). The Council has determined that the proposed action is consistent with the National Standards of the MSA and all other applicable laws.

7.9 Executive Order 13158 (Marine Protected Areas)

Executive Order (EO) 13158 on Marine Protected Areas (MPAs) requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The EO directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the EO. The EO requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. A list of MPA sites has been developed and is available at: http://marineprotectedareas.noaa.gov/nationalsystem/nationalsystemlist/. No further guidance related to this EO is available at this time.

In the Northeast U.S., the only MPAs are the Stellwagen Bank National Marine Sanctuary (SBNMS), the Tilefish Gear Restricted Areas (TGRA) in the canyons of Georges Bank, and the National Estuarine Research Reserves and other coastal sites. The only MPAs that overlap the small-mesh multispecies fishery footprint are the SBNMS and the TGRA.

This action is not expected to more than minimally affect the biological/habitat resources of the SBNMS and the TGRA MPAs, which was comprehensively analyzed in the Omnibus Habitat Amendment 2 (NEFMC 2016). Fishing gears that are used by the small-mesh multispecies fishery and regulated by the Northeast Multispecies FMP are unlikely to damage shipwrecks and other cultural artifacts because fishing vessel operators avoid contact with cultural resources on the seafloor to minimize costly gear losses and interruptions to fishing.

7.10 Executive Order 13132 (Federalism)

Executive Order 131321 on federalism established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in this action, thus preparation of an assessment under EO 13132 is unwarranted. The affected states have been closely involved in the development of the proposed action through their representation on the Council. All affected states are represented as voting members of at least one Regional Fishery Management Council. No comments were received from any state officials relative to any federalism implications associated with this action.

7.11 Executive Order 12898 (Environmental Justice)

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process (EO 12898 1994). The NOAA NAO 216-6, at Section 7.02, states that "consideration of E.O. 12898 should be specifically included in the NEPA documents for decision-making purposes." Agencies should also encourage public participation, especially by affected communities, during scoping, as part of a broader strategy to address environmental justice issues. Minority and low-income individuals or populations must not be excluded from participation in, denied the benefits of, or subjected to discrimination because of their race, color, or national origin.

Environmental justice is measured at the community level, here, defined as a fishing community. Indicators of vulnerability for purposes of environmental justice can include but are not limited to income, race/ethnicity, household structure, education levels, and age. The NOAA Fisheries Community Social Indicators, especially the poverty, population composition, and personal disruption indices (Table 20) can help identify the communities where environmental justice may be of concern. Small-mesh multispecies fishery primary ports that ranked medium-high to high for at least one of these indices include New Bedford, MA, Newport, RI, and New London, CT. These communities may be more vulnerable to changes in Federal actions, due to factors described above as important indicators for environmental justice.

Although the impacts of this action may affect communities with environmental justice concerns, the proposed actions should not have disproportionately high effects on low income or minority populations. The proposed actions would apply to all participants in the affected area, regardless of minority status or income level. The existing demographic data on participants in the small-mesh multispecies fishery (i.e., vessel owners, crew, dealers, processors, employees of supporting industries) do not allow identification of those who are classified as below the poverty level or who are racial or ethnic minorities. Thus, it is impossible to fully determine how the actions within this specification document may impact these population segments. The public comment process is an opportunity to identify issues that may be related to environmental justice, but none have been raised relative to this action.

For the top port communities relevant to this action (Section 5.6 and Table 17), poverty and minority rate data at the state and county levels are in Table 39. Generally, their minority population rates are below those of all states' averages. Only Essex and Suffolk counties in Massachusetts have minority rates higher than the states' averages. Similarly, counties important for small-mesh multispecies fishing have poverty rates generally lower than the state averages. Bristol and Suffolk counties in Massachusetts have poverty rates higher than the state average.

With respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. GARFO tracks these issues, but there are no federally recognized tribal agreements for subsistence fishing in federal waters off New England.

Table 39. Demographic data for small-mesh multispecies fishing communities (counties).

State/County	Minority Rate[a]	Poverty Rate[b]
New Hampshire	7.8%	7.0%
Rockingham	6.0%	4.6%
Massachusetts	23.6%	9.4%
Barnstable	8.6%	7.7%
Bristol	13.5%	10.1%
Essex	24.3%	9.0%
Suffolk	38.5%	16.5%
Rhode Island	23.5%	10.6%
Washington	7.9%	7.8%
Connecticut	20.0%	9.7%
New London	16.4%	8.0%
New York	30.3%	12.7%
Suffolk	15.6%	6.1%

Source: U.S. Census Bureau, 2020, SAIPE State and County Estimates for 2020 (census.gov) [a] Persons other than those who report as White persons not Hispanic, 2006-2010.
[b] Persons below poverty level, 2020.

7.12 Regulatory Flexibility Act (RFA)

The purpose of the Regulatory Flexibility Act (RFA) is to reduce the impacts of regulations and recordkeeping requirements on small businesses. To achieve this goal, the RFA requires Federal agencies to describe and analyze the effects of proposed regulations, and possible alternatives, on small business entities. To this end, this document contains an RFA analysis, found below, which includes an assessment of the effects that the Proposed Action and other alternatives are expected to have on small entities.

Under Section 603(b) of the RFA, the RFA analysis must describe the impact of the proposed rule on small entities and contain the following information:

1. A description of the reasons why the action by the agency is being considered.
2. A succinct statement of the objectives of, and legal basis for, the proposed rule.
3. A description—and, where feasible, an estimate of the number—of small entities to which the proposed rule will apply.
4. A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the types of professional skills necessary for preparation of the report or record.
5. An identification, to the extent practicable, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule.

7.12.1 Reasons for Considering the Action

The purpose and need for this action are presented in Section 3.2.

7.12.2 Objectives and Legal Basis for the Action

The objectives for this action are presented in Section 3.2, and the legal basis is in Section 7.0.

7.12.3 Description and Estimate of Small Entities to Which the Rule Applies

For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, and including its affiliates, is not dominant in its field of operation, and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide.

Description of regulated entities.

This rule would affect all permitted small-mesh multispecies vessels; therefore, the direct regulated entity is a firm that owns at least one small-mesh multispecies permit (either an open access or limited access NE multispecies permit). Each vessel may be individually owned or part of a larger corporate ownership structure, and for RFA purposes, it is the ownership entity that is ultimately regulated by the proposed action. Ownership entities are identified on June 1st of each year based on the list of all permit numbers, for the most recent complete calendar year, that have applied for any type of Northeast Federal fishing permit. These businesses catch a small fraction of small-mesh multispecies; furthermore, they are minimally affected by the proposed action (Section 6.6).
To estimate the number of commercial business entities that may experience impacts from the proposed action on fishery specification (2024-2026), active small-mesh multispecies (SMS) entities landing small-mesh multispecies are defined as those entities containing permits that are directly regulated and that landed small-mesh multispecies as recent as in 2022 for commercial sale. In 2022, there were 247 business entities landing small-mesh multispecies (whiting and/or red hake), of which 245 (99%) were small business entities, that could potentially be affected by the proposed specification measures for 2024-2026. There were two large entities landing small-mesh multispecies, but they only landed small-mesh multispecies worth about $69,000 in aggregate (or 0.2% of their total income from fishing). On average, small entities derived approximately 5.37% of total entity fishing income from small-mesh multispecies. The proposed action would largely affect 245 small business entities as of 2022 (Table 40). From 2018-2022, the number of business entities engaged in small-mesh species landings has declined but the average revenue per entity has increased.

Certification. The purpose of the Regulatory Flexibility Analysis (RFA analysis) is to reduce the impacts of burdensome regulations and record-keeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. Based on this information, the Regulatory Flexibility Analysis determines whether the preferred alternative would have a "significant economic impact on a substantial number of small entities." Since the overall economic impact of the proposed action is slight positive and not shown to have a significant adverse impact on a substantial number of small, regulated entities, the RFA allows Federal agencies to certify the proposed action to that effect to the Small Business Association (SBA). The decision on whether to certify is generally made after the final decision on the preferred alternatives for the action and may be documented at either the proposed rule or the final rule stage. The Chief Counsel for Regulation of the Department of Commerce certified to the Chief

Counsel for Advocacy of the Small Business Administration (SBA) that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities.

Table 40. Total number of potentially impacted, directly regulated entities landing small-mesh multispecies (whiting and/or red hake) and the number classified as small business entities (Fishing income or revenue in current dollars), CY 2018-2022.

Business Size	Calendar Year	No. of Business Entities	No. of permits held by business entities	No. of permits landing SMS	Fishing income per Entity	SMS revenue per Entity	Total Fishing Income	Total SMS revenue	Ratio of per entity revenue from SMS to Fish Income (in %)
A	B	C	D	E	F=H/C	G=I/C	H	I	J=F/G*100
Large	2018	3	33	29	$17,797,007	$697	$53,391,020	$2,092	0.004%
	2019	3	33	30	$19,071,897	$579	$57,215,691	$1,737	0.003%
	2020	2	21	19	$18,623,882	$2,302	$37,247,764	$4,603	0.012%
	2021	3	33	31	$21,180,775	$6,058	$63,542,325	$18,173	0.029%
	2022	2	21	20	$17,537,505	$34,563	$35,075,009	$69,126	0.197%
Small	2018	315	467	407	$677,267	$31,781	$213,339,221	$10,011,000	4.693%
	2019	301	455	389	$778,548	$30,000	$234,343,041	$9,029,983	3.853%
	2020	270	413	357	$714,502	$36,999	$192,915,616	$9,989,850	5.178%
	2021	261	391	351	$805,428	$38,516	$210,216,611	$10,052,579	4.782%
	2022	245	389	337	$872,487	$46,847	$213,759,345	$11,477,630	5.369%

7.12.4 Record Keeping and Reporting Requirements

There are no additional record keeping or reporting requirements associated with this action.

7.12.5 Duplication, Overlap, or Conflict with Other Federal Rules

No relevant Federal rules have been identified that would be duplicated overlapped or in conflict with the proposed rule.

7.12.6 Summary of the Proposed Action and Significant Alternatives

During the development of preferred alternatives for 2024-2026 specifications, NMFS and the Council considered ways to reduce the regulatory burden on and provide flexibility to the regulated community. The measures that would be implemented by the new specifications would increase the long-term economic benefits on small entities. The proposed action would adjust the annual catch limits and related specifications to account for recent trends in stock biomass, and discards and state water landings of small-mesh multispecies.

Overall, the 2024-2026 specifications would ensure that catch levels are sustainable, reduce the risk of overfishing, and contribute to rebuilding southern red hake stock, and therefore, maximize yield.

7.13 Executive Order 12866 (Regulatory Planning and Review)

The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." E.O. 12866 requires a review of proposed regulations to determine whether the expected effects would be significant, where a significant action is any regulatory action that may:

- *Have an annual effect on the economy of $200 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;*
- *Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;*
- *Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or*
- *Raise novel legal or policy issues arising out of legal mandates, the President's priorities, of the principles set forth in the Executive Order.*

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, include the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider.

7.13.1 Statement of the Problem/Goals and Objectives

Problem, goals, and objectives are explained in Section 3.2.

7.13.2 Management Alternatives and Rationale

The alternatives under consideration are explained in Section 4.0. One action, FY 2024-2026 small-mesh multispecies specifications, is proposed and the alternatives are analyzed by this EA. Alternative 2 with Option 2 for northern red hake TAL is preferred to prevent overfishing and reduce the risk of stocks becoming overfished. Alternative 2 would set specifications consistent with SSC recommendations based on updated data. Due to uncertainties in more recent discard estimates, Option 2 for the northern red hake TAL would use the FY 2017-2019 discard rate for northern red hake rather than the FY 2020-2022 discard rate to calculate the TAL.

7.13.3 Description of the Fishery

A description of the fishery is available in Sections 5.2 and 5.6.

7.13.4 Summary of Impacts

The expected short term economic effects of each specification alternative relative to no action for the small-mesh multispecies fishery are discussed throughout Section 6.6 and the preferred alternatives are summarized below.

1) Section 6.6.2: Alternative 2 (Updated 2024-2026 Specifications with Option 2 for northern red hake TAL; Preferred).

The proposed changes in specifications are expected to increase ex-vessel revenues by a maximum of $4.2 to 7.6 million relative to No Action. Recently, the fishing fleet has been catching less than the proposed catch and landings specifications due to technical, regulatory, and market constraints. Thus, neither whiting catch nor landings are expected to rise as much as the new specifications will allow.

The combined economic impacts of these alternatives compared to taking no action, therefore, could increase ex-vessel revenues by as much as $4.23 million (Table 33), but it is expected to rise much less than this due to reasons stated above.

7.13.5 Determination of Significance

Based on the analyses provided in this document, the adjustments to fishery specifications for 2024-2026 do not constitute a "significant regulatory action." This action will not have an impact of $200 million or more on the economy, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities. It also does not raise novel legal and policy issues and does not interfere with an action taken or planned by another agency. Finally, it does not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients. As such, the Proposed Action is not considered significant as defined by EO 12866.

8.0 GLOSSARY

Area based management – In contrast to resource wide allocations of TAC or days, vessels would receive authorization to fish in specific areas, consistent with that area's status, productivity, and environmental characteristics.

ABC – "Acceptable biological catch" means a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL.

ACL – "Annual catch limit" is the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures (AMs).

Adult stage – One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect – Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific of habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation – A group of animals or plants occurring together in a particular location or region.

AMs – "Accountability measures" are management controls that prevents ACLs or sector ACLs from being exceeded, where possible, and correct or mitigate overages if they occur.

Amendment – a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure".

Availability – refers to the distribution of fish of different ages or sizes relative to that taken in the fishery.

Benthic community – Benthic means the bottom habitat of the ocean and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. Benthic community refers to those organisms that live in and on the bottom.

Biological Reference Points – specific values for the variables that describe the state of a fishery system which are used to evaluate its status. Reference points are most often specified in terms of fishing mortality rate and/or spawning stock biomass.

Biomass – The total mass of living matter in a given unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan-1), Mid-Year, or mean (average during the entire year). In addition, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1+, ages 4+ 5, etc.). See also spawning stock biomass, exploitable biomass, and mean biomass.

Biota – All the plant and animal life of a particular region.

Bivalve – A class of mollusks having a soft body with plate like gills enclosed within two shells hinged together; e.g., clams, mussels.

Bottom tending mobile gear – All fishing gear that operates on or near the ocean bottom that is actively worked in order to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear – All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

B_{MSY} – the stock biomass that would produce maximum sustainable yield (MSY) when fished at a level equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity.

Bycatch(v.) the capture of non-target species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program. Target species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity – the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

Catch – The sum total of fish killed in a fishery in a given period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment – Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g. within the mud class, silt is coarser than clay.

Continental shelf waters – The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies, but is approximately 200 meters in many regions.

Council – New England Fishery Management Council (NEFMC).

CPUE – Catch per unit effort. This measure includes landings and discards (live and dead), often expressed per hour of fishing time, per day fished, or per day-at-sea.

DAS – A day-at-sea is an allocation of time that a vessel may be at-sea on a fishing trip. For vessels with VMS equipment, it is the cumulative time that a vessel is seaward of the VMS demarcation line. For vessels without VMS equipment, it is the cumulative time between when a fisherman calls in to leave port to the time that the fisherman calls in to report that the vessel has returned to port.

Demersal species – Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Discards – animals returned to sea after being caught; see Bycatch (n.)

Environmental Assessment (EA) – an analysis of the expected impacts of a fishery management plan (or some other proposed federal action) on the environment and on people, initially prepared as a "Draft" (DEA) for public comment. The Final EA is referred to as the Final Environmental Assessment (FEA).

Essential Fish Habitat– Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998). Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998) maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Exclusive Economic Zone – for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exempted fisheries – Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Exploitation Rate – the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fathom – A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Final preferred alternative – The management alternative chosen by the Council in the final amendment, submitted to the Secretary of Commerce for approval and if approved publication as a proposed rule.

Fishing effort – the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Fishing Mortality (F) – (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. F is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

F_{MSY} – a fishing mortality rate that would produce the maximum sustainable yield from a stock when the stock biomass is at a level capable of producing MSY on a continuing basis.

FMAX – the fishing mortality rate that produces the maximum level of yield per recruit. This is the point beyond which growth overfishing begins.

FMP (Fishery Management Plan) – a document that describes a fishery and establishes measures to manage it. This document forms the basis for federal regulations for fisheries managed under the regional Fishery Management Councils. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

$F_{threshold}$ – 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Growth Overfishing – the situation existing when the rate of fishing mortality is above FMAX and then the loss in fish weight due to mortality exceeds the gain in fish weight due to growth.

Individual Fishing Quota (IFQ) – A Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Landings – The portion of the catch that is harvested for personal use or sold.

Larvae (or Larval) stage – One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the egg for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Limited Access – a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation, and the participants remain constant over time (with the exception of attrition).

Limited-access permit – A permit issued to vessels that met certain qualification criteria by a specified date (the "control date").

LPUE – Landings per unit effort. This measure is the same as CPUE but excludes discards.

Maximum Sustainable Yield (MSY) – the largest average catch that can be taken from a stock under existing environmental conditions.

Mesh selectivity (ogive) – A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 is the length where 50% of the fish encountered are retained by the mesh.

Meter – A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton – A unit of weight equal to a thousand kilograms (1kgs = 2.2 lb.). A metric ton is equivalent to 2,204.6 lb. A thousand metric tons is equivalent to 2.204 million lb.

Minimum Biomass Level – the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long-term.

Mortality – Noun, either referring to fishing mortality (F) or total mortality (Z).

Multispecies – the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, winter flounder, witch flounder, American plaice, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Natural Mortality (M) – a measurement of the rate of fish deaths from all causes other than fishing such as predation, cannibalism, disease, starvation, and pollution; the rate of natural mortality may vary from species to species.

Non-preferred alternative - All alternatives in the final amendment that were not chosen as a "final preferred alternative" are by definition non-preferred alternatives.

Northeast Shelf Ecosystem – The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Northern stock area – for red and silver hake, fish are assumed to be in the southern stock area when the catches originate from fishing in statistical areas 464 to 515, or area 561. See map at http://www.nero.noaa.gov/nero/fishermen/charts/stat1.html.

Observer – Any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act

OFL – "Overfishing limit" means the annual amount of catch that corresponds to the estimate of the maximum fishing mortality threshold applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

Open access – Describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Optimum Yield (OY) – the amount of fish which-

a) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of

b) marine ecosystems, is prescribed as such on the basis of the maximum sustainable yield from the fishery,

c) as reduced by any relevant economic, social, or ecological factor; and in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Overfished – A conditioned defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing – A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

PDT (Plan Development Team) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council; the Council has a Whiting PDT that meets to discuss the development of this FMP.

Preferred alternative – An alternative that was favored by the Council in the draft amendment document and DEA based on analysis available at that time and based on input from the Whiting Advisory Panel.

Proposed Rule – a federal regulation is often published in the Federal Register as a proposed rule with a time period for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Rebuilding Plan – a plan designed to increase stock biomass to the BMSY level within no more than ten years (or 10 years plus one mean generation period) when a stock has been declared overfished.

Recruitment overfishing – fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Recruitment – the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. "Recruitment" also refers to new year classes entering the population (prior to recruiting to the fishery).

Regulated groundfish species – cod, winter flounder, witch flounder, American plaice, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation – an index of exploitation derived by dividing landings by trawl survey biomass. This variable does not provide an estimate of the proportion of removals from the stock due to fishing but allows for general statements about trends in exploitation.

Sediment – Material deposited by water, wind, or glaciers.

Small-mesh multispecies – red hake, silver hake, and offshore hake

Small-mesh trawls – specified trawls that are exempt from large-mesh fishery regulations pertaining to trawl with cod end mesh greater than 5.5- or 6-inches square or diamond.

Southern stock area – for red and silver hake, fish are assumed to be in the southern stock area when the catches originate from fishing in statistical areas 521 to 543, area 562, or areas 611 to 639. See map at http://www.nero.noaa.gov/nero/fishermen/charts/stat1.html.

Spawning stock biomass (SSB) – the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Status Determination Criteria – objective and measurable criteria used to determine if overfishing is occurring or if a stock is in an overfished condition according to the National Standard Guidelines.

Stock assessment – An analysis for determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock – A grouping of fish usually based on genetic relationship, geographic distribution, and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

Surplus production models – A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include trends in stock biomass, biomass weighted fishing mortality rates, MSY, F_{MSY}, B_{MSY}, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Surplus production – Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). B_{MSY} is often defined as the biomass that maximizes surplus production rate.

Survival rate (S) – Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB) – an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAL – Total allowable landings, which for whiting management is equivalent to the ACL The Federal TAL pertains to landings taken by Federally permitted vessels and excludes landings made by vessel with no Federal permits that fish in state waters. The Federal TAL pertains to landings taken by Federally permitted vessels and excludes landings made by vessel with no Federal permits that fish in state waters

Ten-minute- "squares" of latitude and longitude (TMS) – A measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles at 40° of latitude. This is the spatial area that EFH designations, biomass data, and some of the effort data have been classified or grouped for analysis.

Total mortality – The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Year class (or cohort) – Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

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