2021-2026
Atlantic Surfclam and Ocean Quahog Specifications
Environmental Assessment and
Regulatory Flexibility Act Analysis

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Prepared by the
Mid-Atlantic Fishery Management Council
in cooperation with
the National Marine Fisheries Service

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
(302) 674-2331 tel.
(302) 674-5399 fax

National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930
(978) 281-9315 tel.
(978) 281-9135 fax

1.0 EXECUTIVE SUMMARY

This document was prepared by the Mid-Atlantic Fishery Management Council (MAFMC or Council) in consultation with the National Marine Fisheries Service (NMFS). The purpose of this action (specifications document) is to implement commercial quotas for the Atlantic surfclam and ocean quahog fisheries in 2021-2026 that are necessary to prevent overfishing and ensure annual catch limits (ACLs) are not exceeded.

This specifications document was developed in accordance with all applicable laws and statutes as described in section 8.0 and the document details all management alternatives for the surfclam and ocean quahog fisheries for a 6-year period (2021-2026). Under the FMP, if no action is taken to set specifications, a continuation of harvest is unlikely. The actions that would likely result from failure to set specifications are given in section 5.0. If none of the alternatives proposed in this document are implemented, some current management measures will remain in place, but the overall management program may not be identical to that of 2020. If the no action alternative is defined as the failure to set specifications for each fishery, it would be infeasible and inconsistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Therefore, this version of no action is not analyzed further. Rather, the *status quo* alternatives are used as a baseline for comparison and are a more realistic version of the impacts that may be expected if specifications are not set. For the 2021-2026 alternatives, the base line condition is the commercial quotas for 2020 (note that in 2019 and 2020, the same quota levels were implemented) and the most recent fisheries landings that occurred in 2019.

The proposed actions in this specifications document only considers modifications of the commercial quotas for the surfclam and ocean quahog fisheries for 2021-2026 (Box ES-1), and continuation of measures to suspend the surfclam minimum shell length requirement (Box-ES-2). The Council did not recommend changes to other regulations in place for these fisheries. Therefore, any other fishery management measures in place will remain unchanged (*status quo*) for the 2021-2026 fishing years.

Summary of Alternatives

The following section presents a qualitative summary of expected impacts, by species, for the alternatives under consideration for 2021-2026 (Box ES-1). For purposes of impact evaluation, *status quo* alternatives for 2021-2026 are compared to the 2019 condition, while all other alternatives are compared to the *status quo* alternative. Details on these comparisons are available in section 7.1 and 7.2 of this specifications document. As previously discussed, the no action alternative (defined as no specification setting) is not analyzed. Rather, the *status quo* is analyzed for a more accurate comparison of the impacts associated with taking action.

Box ES-1. Summary of the 2021-2026 surfclam and ocean quahog quota alternatives analyzed in this specifications document. Commercial quotas given in metric tons and millions (mil) of bushels. The quotas given here would apply to each year.

Alternatives	Resource	2021 -2026 Quotas
Alternative 1 (Preferred: *Status Quo/*Least Restrictive)	Surfclam	26,218 mt 3.40 mil bu
	Ocean Quahog[1]	24,689 5.44 mil bu
Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	20,218 mt 2.63 mil bu
	Ocean Quahog[1]	22,680 mt 5.00 mil bu
Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	14,265 mt 1.85 mil bu
	Ocean Quahog[1]	18,144 mt 4.00 mil bu

[1] Combined commercial quota, including both Maine and Non-Maine quota.

Box ES-2. Summary of the 2021-2026 surfclam alternatives analyzed for the surfclam minimum shel length requirement.

Alternatives	Description
Alternative 1 (Preferred: *Status Quo*)	The minimum shell length (i.e., size limit) of 4.75 inches (12.065 cm) on surfclam will be suspended in 2021-2026 resulting in no minimum shell length requirements for the fishery during that time.
Alternative 2 (Non-Preferred: No Action)	The shell length requirement will be implemented for this fishery in 2021-2026. The minimum size of 4.75 inches (12.065 cm) will automatically go into effect as of January 1.

2021-2026 Surfclam and Quahog Catch Limit and Quota Alternatives

Overall, preferred alternative 1 (*status quo*) for surfclam and ocean quahog catch limits for 2021-2026 is expected to result in impacts on the managed resources and non-target species that are slightly positive in 2021-2026, when compared to the current conditions (Box ES-3). Non-preferred alternative 2 (Mid-Point) for 2021-2026 is expected to result in no impacts on the managed resource and non-target species when compared to *status quo* measures (alternative 1). This alternative proposes commercial quotas that are lower than those considered under alternative 1. Non-preferred alternative 3 for 2021-2026 is the most restrictive alternative and is expected to have overall impacts that range from no impact to slight positive, when compared to the *status quo*. This most restrictive alternative may be more restrictive than necessary given the advice of the Scientific and Statistical Committee (SSC). All three alternatives would be consistent with the recommendations of the Council's SSC because the proposed quotas are lower than the recommended acceptable biological catches (ABCs). Ranking these three alternatives from more likely to less likely to result in overall positive biological impacts, they rank as alternative 3, alternative 2, and alternative 1.

Overall, preferred alternative 1 (*status quo*) for 2021-2026 is expected to result in slight negative impacts on physical habitat, when compared to the current conditions (Box ES-3). Non-preferred alternative 2 for 2021-2026 is expected to result in no impacts on physical habitat, when compared to the *status quo* measures (alternative 1). Non-preferred alternative 3 for 2021-2026 is the most restrictive alternative and is expected to have overall habitat impacts that range from no impact to slight positive, when compared to the *status quo*. Alternative 3 is more likely to result in positive habitat impacts, than alternatives 1 and 2.

Given the range of potential impacts on protected resources, preferred alternative 1 (*status quo*) for 2021-2026 is expected to result in no impacts (Box ES-3) to protected resources because of the lack of documented interactions between the clam dredge gear and these species. Non-preferred alternatives 2 and 3 for 2021-2026 are also expected to result in no impacts on protected resources, when compared to *status quo*.

Overall, under preferred alternative 1 (*status quo*) for 2021-2026, slight positive impacts on human communities are expected, when compared to the current conditions (Box ES-3). Under non-preferred alternative 2 for 2021-2026, no impacts on human communities are expected, when compared to the *status quo*. Non-preferred alternative 3 for 2021-2026 is expected to result in negative social and economic impacts, when compared to the *status quo*. Ranking these three alternatives from more likely to less likely to result in overall positive impacts, they rank as alternative 1, alternative 2, and alternative 3.

2021-2026 Surfclam Minimum Shell Length Alternatives

When comparing across the two alternatives for 2021 for shell length, alternative 2 (No Action on Minimum Shell Length; Box Es-4) will result in negative social and economic impacts when compared to the *status quo* measures (alternative 1) as it would result in substantial costs to small business entities. For the target species (surfclam), non-target species, physical habitat, and

protected resources, the difference between these two alternatives is considered negligible and alternative 2 would result in no impact compared to the *status quo* measures (alternative 1).

Both of these alternatives will continue to maintain those slight positive impacts on the human communities associated with these fisheries when compared to the current conditions, although those impacts may be slightly less positive under alternative 2.

Cumulative Impacts

For surfclam and ocean quahog, the Council analyzed the managed resources (target) and non-target species, physical habitat, protected species, and human communities (socioeconomic) impacts of the Council-considered alternatives. When the proposed action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative; therefore, there are no significant cumulative effects on the human environment associated with the action proposed in this document (see section 7.3).

Conclusions

A detailed description and discussion of the expected environmental impacts resulting from each of the alternatives, as well as any cumulative impacts, considered in this specifications document are provided in section 7.0. None of the preferred action alternatives are associated with significant impacts to the target and non-target species, physical habitat, protected species, or human communities individually or in conjunction with other actions under National Environmental Policy Act (NEPA); therefore, a "Finding of No Significant Impact" is warranted.

Box ES-3. Overall qualitative summary of the expected impacts on the current conditions of valued ecosystem components, from surfclam and ocean quahog quota alternatives considered in this document for 2021-2026. A minus sign (-) signifies an expected negative impact, a plus sign (+) signifies an expected positive impact, and zero (0) is used to indicate no impact. A "sl" in front of a sign is used to convey a minor effect, such as slight positive (sl+).

Year	Alternatives	Target (surfclam and ocean quahog) and Non-target Species	Physical Habitat	Protected Resources	Human Communities (Socioeconomic)
2021-2026 (same for each year)	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	sl+	sl-	0	sl+
	Alternative 2 (Non-Preferred: Mid-Point)	sl+	sl-	0	sl+
	Alternative 3 (Non-Preferred: Most Restrictive)	sl+	sl-	0	sl+

Box ES-4. Overall qualitative summary of the expected impacts on the current conditions of valued ecosystem components, from surfclam and ocean quahog quota alternatives considered in this document for 2021-2026. A minus sign (-) signifies an expected negative impact, a plus sign (+) signifies an expected positive impact, and zero (0) is used to indicate no impact. A "sl" in front of a sign is used to convey a minor effect, such as slight positive (sl+).

Year	Alternatives	Target (surfclam and ocean quahog) and Non-target Species	Physical Habitat	Protected Resources	Human Communities (Socioeconomic)
2021-2026 (same for each year)	**Alternative 1** (Preferred: *Status Quo*)	sl+	sl-	0	sl+
	Alternative 2 (Non-Preferred)	sl+	sl-	0	sl+

2.0 LIST OF FREQUENTLY USED ACRONYMS, CONVERSIONS, AND DEFINITIONS

Acronyms

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
CEA	Cumulative Effects Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CZM	Coastal Zone Management
d/k	Discard/Kept
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EMU	Ecological Marine Unit
EO	Executive Order
ESA	Endangered Species Act
FR	Federal Register
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
GARFO	Greater Atlantic Regional Fisheries Office
HMA	Habitat Management Area
IRFA	Initial Regulatory Flexibility Analysis
ITQ	Individual Transferable Quota
LPUE	Landings Per Unit Effort
MAFMC	Mid-Atlantic Fishery Management Council Or Council
MMPA	Marine Mammal Protection Act
MFMT	Maximum Fishing Mortality Threshold
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NAO	National Oceanic and Atmospheric Administration Administrative Order
NEFMC	New England Fishery Management Council
NAO	National Oceanic and Atmospheric Administration Administrative Order
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Limit
OHA2	Omnibus EFH Amendment 2
OY	Optimal Yield
PBR	Potential Biological Removal
PRA	Paperwork Reduction Act
PSI	Pounds per Square Inch
PSP	Paralytic Shellfish Poisoning
RFA	Regulatory Flexibility Act
SASI	Swept Area Seabed Impact
SAW	Stock Assessment Workshop
SBA	Small Business Administration
SS	Stock Synthesis

SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
U.S.	United States
VECs	Valued Ecosystem Components
WGOM	Western Gulf of Maine

Conversions: 1 metric ton (mt) = 2,204.622 pounds (lb); 1 kilometer (Km) = 0.621 miles; 1 meter (m) = 3.280 feet (ft); 1 centimeter (cm) = 0.393 inches; 1 Maine bushel = 11 lb meats (1.2445 ft3); 1 surfclam bushel = 17 lb meats (1.88 ft3); 1 ocean quahog bushel = 10 lb meats (1.88 ft3). Number of bushels divided by 32 = number of cage tags.

Maine quota: Maximum allowable Maine ocean quahog quota: 100,000 Maine bushels

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ENVIRONMENTAL ASSESSMENT

4.0 INTRODUCTION AND BACKGROUND OF SPECIFICATION PROCESS

4.1 PURPOSE AND NEED OF THE ACTION

The purpose of this action (specifications document) is to implement commercial quotas for the Atlantic surfclam and ocean quahog fisheries in 2021-2026. The need for this action is to prevent overfishing and ensure annual catch limits (ACLs) are not exceeded. This specifications document was developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and National Environmental Policy Act (NEPA), the former being the primary domestic legislation governing fisheries management in the U.S. Exclusive Economic Zone (EEZ), and the Atlantic Surfclam and Ocean Quahog Fishery Management Plan (FMP). Failure to specify management measures that constrain catch to prevent overfishing for surfclam and ocean quahog would be inconsistent with the National Standards under the MSA. The management regime and objectives of the fishery are detailed in the FMP, including any subsequent amendments, and are available at: http://www.mafmc.org.

The MSA requires each Council's Scientific and Statistical Committee (SSC) to provide recommendations for acceptable biological catch (ABC), preventing overfishing, and maximum sustainable yield (MSY). The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. In addition, the Council staff develop recommendations for the Council on the management measures necessary to achieve the recommended catch limits, including recommendations for annual catch targets (ACTs). A memo from the SSC chairman to the Council chair, dated July 31, 2020 (available at http://www.mamfc.org), provides details on the derivation of ABC for each managed resource and highlights the specific sources of scientific uncertainty that were of particular relevance to the SSC deliberation. An overview is provided here.

4.2 BACKGROUND

The SSC identified an overfishing limit (OFL) for surfclam for 2021-2026 of 51,361 mt, 48,202 mt, 45,958 mt, 44,629 mt, 44,048 mt, and 43,886 mt, respectively. The OFL is the maximum amount of catch that can be removed from the stock without causing overfishing, and is derived using the maximum fishing mortality threshold (MFMT) rate as applied to the projected stock size. The SSC reviewed the management track assessment and recommended an ABC for 2021-2026 of 47,919 mt, 44,522 mt, 42,237 mt, 40,946 mt, 40,345 mt, and 40,264 mt, respectively. These are based on the Council risk policy and assume a lognormal OFL distribution with a coefficient of variation (CV) = 100 percent, and are expected to result in a probability of overfishing in 2021-2026 of 47, 46, 46, 46, 46, and 46 percent, respectively. Catch is defined as the sum of landings, a 12 percent incidental mortality applied to landings, and discards (which are assumed to be 0). The ACL is equal to the ABC; and the Council recommended the ACT for 2021-2026, be set at 29,363 mt, which results in a commercial quota of 26,218 mt (3.40 million bushels).

The SSC identified an overfishing limit (OFL) for ocean quahog for 2021-2026, of 44,960 mt, 45,001 mt, 45,012 mt, 44,994 mt, 44,948 mt, and 44,875 mt, respectively. The OFL is the maximum amount of catch that can be removed from the stock without causing overfishing, and is derived using the maximum fishing mortality threshold (MFMT) rate as applied to the projected stock size. The SSC reviewed the management track assessment and recommended an ABC for 2021-2026 of 44,031 mt, 44,072 mt, 44,082 mt, 44,065 mt, 44,020 mt, and 43,948 mt, respectively. These are based on the Council risk policy and assume a lognormal OFL distribution with a CV = 100 percent and are expected to result in a probability of overfishing in 2021-2026 of 49 percent in each year. Catch for ocean quahog is defined as the sum of landings, a 5 percent incidental mortality applied to landings, and discards (which are assumed to be 0). The ACL is equal to the ABC; and the Council recommended the annual catch target (ACT) for the Maine fishery be set as 524 mt, and the Non-Maine fishery ACT is 25,511 mt, which results in a Maine commercial quota of 499 mt (100,000 ME bushels) and a Non-Maine commercial quota of 24,296 mt (5.36 million bushels) for 2021-2026.

After consideration of the SSC and Advisory Panel recommendations, the Council has developed recommendations to the NMFS Northeast Regional Administrator. The Regional Administrator will review the recommendations forwarded through this document and may revise them if necessary, to achieve FMP objectives and statutory requirements. This specifications document serves a dual purpose. It conveys the Council recommendations (i.e., preferred alternatives) to the Regional Administrator and also serves as a decision document for the Regional Administrator, who reviews the analysis of impacts of the various management alternatives presented here and determines which alternative achieves the FMP objectives as well as the objectives and statutory requirements under MSA and other applicable laws.

This Environmental Assessment (EA) examines the impacts of each proposed action on the human environment. The aspects of the human environment that are likely to be directly or indirectly affected by the actions proposed in this document are described as *valued ecosystem components* (VECs; Beanlands and Duinker 1984). These VECs comprise the affected environment and are specifically defined as the managed resources (surfclam and ocean quahog) and any non-target species; habitat, including EFH for the managed resource and non-target species; Endangered Species Act (ESA) listed and Marine Mammal Protection Act (MMPA) protected species; and any human communities (social and economic aspects of the environment). The impacts of the alternatives are evaluated with respect to these VECs.

All management alternatives under consideration for surfclam and ocean quahog were analyzed for 2021-2026. A full description of each catch limit/quota alternative for 2021-2026, a discussion of a no action alternative, and minimum shell length alternatives, are given in section 5.0. The preferred *status quo* alternatives were specified at the August 2020 Council meeting. The *status quo* alternatives used in the analysis for 2021-2026 include commercial quotas have been in place since the early-2000s. These recommendations and their impacts are described in section 7.0.

This EA has been prepared using the 1978 CEQ NEPA Regulations. NEPA reviews initiated prior to the effective date of the revised CEQ regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020.

This review began on September 10, 2020 and the agency has decided to proceed under the 1978 regulations.

5.0 MANAGEMENT ALTERNATIVES

The proposed alternatives described below modify the specifications for the Atlantic surfclam and ocean quahog fisheries for 2021-2026. The Council recommended ACLs and ACTs, from which commercial quotas are derived for the 2021-2026 fishing years (preferred), based on the Council's SSC advice on ABCs and scientific uncertainty, and management uncertainty (see section 4.1). The Council did not recommend changes to other regulations in place for these fisheries other than the quotas for both species and surfclam minimum size requirements for 2021; therefore, any other fishery management measures in place will remain unchanged (*status quo*) for the 2021-2026 fishing years (see section 5.4 for additional discussion). Comprehensive descriptions of the regulations for surfclam and ocean quahog as detailed in the Code of Federal Regulations (CFR) are available through the website for the Greater Atlantic Regional Fisheries Office (GARFO) of NMFS: https://www.fisheries.noaa.gov/content/greater-atlantic-region-regulations.

Under the management programs for surfclam and ocean quahog, detailed in the FMP, the no action alternative is not equivalent to the *status quo* alternative (see below for additional discussion). Therefore, for purposes of comparing impacts throughout this document, the proposed alternatives for each species are compared to the *status quo* alternative (baseline) as opposed to the "true" no action alternative.

The comprehensive system of catch limits and accountability measures considers both scientific and management uncertainty, and is designed to ensure commercial catch does not exceed the ACL, which is equal to the ABC. The amount of total catch, landings, incidental mortality, and discards produced in these fisheries in 2021-2026 is contingent on how the fishery regulations and individual transferable quotas (ITQs) interact to achieve the specific levels of overall commercial quotas implemented. Therefore, for the purposes of impact analyses, changes in the commercial quotas and associated landings are expected to drive any anticipated changes in effort and impacts on the valued VECs considered in this EA.

The ABCs, ACLs, and ACTs that were recommended under the preferred alternatives, as well as the commercial quotas, are given below in Table 1. For some of the non-preferred alternatives, only commercial quotas are provided, as the system of annual catch limits is recently implemented and the history of implementation for those other catch limits (i.e., ABCs, ACLs, or ACTs) does not exist or cannot be derived. Given changes in the underlying commercial quotas and landings levels are the focus of the impact analysis, a meaningful comparison can be done without those other catch limit levels being provided for non-preferred alternatives.

Section 5.03(b) of NOAA Administrative Order (NAO) 216-6, "Environmental review procedures for implementing the National Environmental Policy Act," states that "an Environmental Assessment (EA) must consider all reasonable alternatives, including the preferred action and the no action alternative." Consideration of the "no action" alternative is important because it shows what would happen if the proposed action is not taken. Defining exactly what is meant by the "no

action" alternative is often difficult. The President's Council on Environmental Quality (CEQ) has explained that there are two distinct interpretations of the "no action:" One interpretation is essentially the *status quo*, i.e., no change from the current management; and the other interpretation is when a proposed project, such as building a railroad facility, does not take place. In the case of the proposed 2021-2026 catch limit alternatives for surfclam and ocean quahog below in sections 5.1-5.6, determining the no action alternative is slightly more complicated than either of these interpretations suggest.

The *status quo* management for the surfclam and ocean quahog fisheries each involve a set of indefinite (i.e., in force until otherwise changed) management measures, such as permit, vessel, and reporting requirements. These measures will continue as they are even if the proposed specifications are not implemented by NMFS. However, the current management program includes catch and landings limits that are specific to the 2020 fishing year.

There are no "roll-over" provisions currently for these fisheries provided for in the FMP that do not require some form of action on the part of NMFS. Specifically, Section 648.72(c) states "(c) Annual quotas. The annual quotas for surfclam and ocean quahog will remain effective unless revised pursuant to this section. At the end of a multiyear quota period, NMFS will issue notification in the Federal Register if the previous year's specifications will not be changed." This means that if NMFS does not take action to revise or maintain the current specifications, the actions described below could occur:

(1) no 2021-2026 proposed specifications for these fisheries will be published, nor will NMFS issue a continuance of previous specifications; (2) the indefinite management measures for each of these species remain unchanged; (3) no specific cap on the allowable annual catch (i.e., ACLs) and landings in each of these fisheries (i.e., no commercial quotas), and (4) no ITQ tags issued to owners in 2021-2026 because no commercial quota has been set. Under the no action alternatives, the only regulatory controls on fishing effort and harvests would be the indefinite[1] measures. Because Section 648.14(j) states that "It is unlawful for any person to do any of the following:...(vi) Land or possess any surfclam or ocean quahog harvested in or from the EEZ without having been issued, or in excess of, an individual allocation," the fishery could be prohibited from operating.

The implications of inaction in setting the specifications for surfclam and ocean quahog are substantial. These alternatives do not allow NMFS to specify and implement ACLs and commercial quotas for these fisheries, as required in the regulations at 50 CFR part 648, for the upcoming fishing year. Monitoring the ITQ landings is essential for management of these fisheries and forms the backbone of the current ITQ quota-based management systems under the FMP. Therefore, the alternatives proposed for catch and landings limits are compared to *status quo* (baseline) alternatives for 2021-2026, as opposed to the above description of taking no action for specifications.

[1] Comprehensive descriptions of the regulations as detailed in the CFR are available through the website for GARFO for NMFS: https://www.fisheries.noaa.gov/content/greater-atlantic-region-regulations

Table 1. Comparison of the 2021-2026 surfclam and ocean quahog alternatives and associated catch and landings limits (mt meat weights). For ocean quahog the total combined Maine and Non-Maine ACTs and commercial quotas are given here for comparison. Also given, the ratio of ABC/OFL and the P* applied from the Council risk policy. NA = Not applicable.

Year	Alternatives	Resource	ABC	ABC/OFL; P*	ACL	ACT	Commercial Quota
2021	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	Surfclam	47,919 mt	93; 46	47,919 mt	29,363 mt	26,218 mt
		Ocean quahog	44,031 mt	98; 49	44,031 mt	25,924 mt	24,689 mt
	Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	NA	NA	NA	NA	20,218 mt
		Ocean quahog	NA	NA	NA	NA	22,680 mt
	Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	NA	NA	NA	NA	14,265 mt
		Ocean quahog	NA	NA	NA	NA	18,144 mt
2022	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	Surfclam	44,522 mt	92; 46	44,522 mt	29,363 mt	26,218 mt
		Ocean quahog	44,072 mt	98; 49	44,072 mt	25,924 mt	24,689 mt
	Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	NA	NA	NA	NA	20,218 mt
		Ocean quahog	NA	NA	NA	NA	22,680 mt
	Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	NA	NA	NA	NA	14,265 mt
		Ocean quahog	NA	NA	NA	NA	18,144 mt
2023	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	Surfclam	42,237 mt	92; 46	42,237 mt	29,363 mt	26,218 mt
		Ocean quahog	44,082 mt	98; 49	44,082 mt	25,924 mt	24,689 mt
	Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	NA	NA	NA	NA	20,218 mt
		Ocean quahog	NA	NA	NA	NA	22,680 mt
	Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	NA	NA	NA	NA	14,265 mt
		Ocean quahog	NA	NA	NA	NA	18,144 mt

Table 1 Continued. Comparison of the 2021-2026 surfclam and ocean quahog alternatives and associated catch and landings limits (mt meat weights). For ocean quahog the total combined Maine and Non-Maine ACTs and commercial quotas are given here for comparison. Also given, the ratio of ABC/OFL and the P* applied from the Council risk policy. NA = Not applicable.

Year	Alternatives	Resource	ABC	ABC/OFL; P*	ACL	ACT	Commercial Quota
2024	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	Surfclam	40,946 mt	92; 46	40,946 mt	29,363 mt	26,218 mt
		Ocean quahog	44,065 mt	98; 49	44,065 mt	25,924 mt	24,689 mt
	Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	NA	NA	NA	NA	20,218 mt
		Ocean quahog	NA	NA	NA	NA	22,680 mt
	Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	NA	NA	NA	NA	14,265 mt
		Ocean quahog	NA	NA	NA	NA	18,144 mt
2025	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	Surfclam	40,345 mt	92; 46	40,345 mt	29,363 mt	26,218 mt
		Ocean quahog	44,020 mt	98; 49	44,020 mt	25,924 mt	24,689 mt
	Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	NA	NA	NA	NA	20,218 mt
		Ocean quahog	NA	NA	NA	NA	22,680 mt
	Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	NA	NA	NA	NA	14,265 mt
		Ocean quahog	NA	NA	NA	NA	18,144 mt
2026	**Alternative 1** (Preferred: *Status Quo*/Least Restrictive)	Surfclam	40,264 mt	92; 46	40,264 mt	29,363 mt	26,218 mt
		Ocean quahog	43,948 mt	98; 49	43,948 mt	25,924 mt	24,689 mt
	Alternative 2 (Non-Preferred: Mid-Point)	Surfclam	NA	NA	NA	NA	20,218 mt
		Ocean quahog	NA	NA	NA	NA	22,680 mt
	Alternative 3 (Non-Preferred: Most Restrictive)	Surfclam	NA	NA	NA	NA	14,265 mt
		Ocean quahog	NA	NA	NA	NA	18,144 mt

5.1 Alternatives for 2021-2026

5.1.1 Alternative 1 (Preferred: *Status Quo*/Least Restrictive)

Alternative 1 is the preferred surfclam and ocean quahog alternative for 2021-2026. These quotas are near the upper limit of OYs, as noted by industry advisors in their fishery performance report for 2020.[2] These preferred quotas (and associated annual catch targets) for both species are identical for each year. The specific OFLs, ABCs, and ACLs for each year are different - and can be found in Table 1. The ACLs were set equal to the ABC. The ACTs and quotas are lower than the ABCs recommended by the Council's SSC for each year and were derived to be consistent with the Council's risk policy for overfishing (Table 1; see p* and ABC/OFL ratio); therefore, they are expected by the Council and the SSC to ensure that overfishing does not occur.

For surfclam, this alternative includes an ACT equal to 29,363 mt. After applying a 12 percent incidental mortality to the landings and deducting any discards (assumed to be 0), the commercial quota is 26,218 mt (3.40 million bushels) for 2021.

For ocean quahog, this alternative also includes a Maine fishery ACT of 524 mt, and a Non-Maine fishery ACT equal to 25,400 mt. After applying a 5 percent incidental mortality to the landings and deducting any discards (assumed to be 0), the Maine commercial quota is 499 mt (100,000 ME bushels; 2 percent of overall quota) and the Non-Maine commercial quota is 24,190 mt (5.36 million bushels) for each year.

5.1.2 Alternative 2 (Non-Preferred: Mid-Point)

Alternative 2 is a non-preferred surfclam and ocean quahog alternative for 2021 that is based on the mid-point of the ranges of high and low OYs.[2] For surfclam, it includes a commercial quota of 20,218 mt (2.63 million bushels) for each year. For ocean quahog, this includes a Maine commercial quota of 486 mt (97,404 ME bushels; 2 percent of overall quota) and the Non-Maine commercial quota is 22,194 mt (4.89 million bushels) for each year.

5.1.3 Alternative 3 (Non-Preferred: Most Restrictive)

Alternative 3 is a non-preferred most restrictive surfclam and ocean quahog alternative for 2021 that is based on the lower limit of OYs.[2] For surfclam, it includes a commercial quota of 14,265 mt (1.85 million bushels) for 2021.

For ocean quahog, this includes a Maine commercial quota of 363 mt (72,753 ME bushels; 2 percent of overall quota) and the Non-Maine commercial quota is 17,781 mt (3.92 million bushels) for 2021.

[2] Amendment 8 (1988) specified an optimum yield (OY) range as bounds for the fisheries quotas. These were set at 1.85 - 3.4 million bushels (14,265 - 26,218 mt) in the surfclam fishery and between 4.0 - 6.0 million bushels (18,144 - 27,216 mt) in the ocean quahog fishery. These were removed from regulation through Amendment 17 (2016) because of the potential for conflict because the upper limit of the OY ranges could potentially exceed ABCs specified by the SSC. Advisory panel members continue to indicate in their annual fishery performance report, including the one prepared for 2020, that the upper limit of these previously specified ranges are reasonable values for OY for these fisheries from their perspective.

5.2 Minimum Shell Length Alternatives

5.2.1 Alternative 1 (Preferred: *Status Quo*)

Under this preferred alternative, the minimum shell length (i.e., size limit) of 4.75 inches (12.065 cm) on surfclam will be suspended in 2021-2026 resulting in no minimum shell length requirements for the fishery during that time. Specifically, the Regional Administrator will suspend annually, by publication in the Federal Register (FR), the minimum shell-height standard, unless discard, catch, and survey data indicate that 30 percent of the surfclam are smaller than 4.75 inches (12.065 cm) and the overall reduced shell height is not attributable to beds where the growth of individual surfclam has been reduced because of density dependent factors.

5.2.2 Alternative 2 (Non-Preferred: No Action)

Under this non-preferred alternative, the minimum shell length (i.e., size limit) of 4.75 inches (12.065 cm) is not suspended; therefore, the shell length requirement will be implemented for this fishery in 2021-2026. The minimum size of 4.75 inches (12.065 cm) will automatically go into effect as of January 1.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The affected environment consists of those physical, biological, and human components of the environment expected to experience impacts if any of the actions considered in this document were to be implemented. This document focuses on four aspects of the affected environment, which are defined as VECs.

The VECs include:

- Managed species (i.e., surfclam and ocean quahog) and non-target species
- Physical habitat
- Protected species
- Human communities

The following sections describe the recent condition of the VECs.

6.1 Managed Resources and Non-Target Species

6.1.1 Description of the Fisheries

Atlantic surfclam are distributed along the western North Atlantic Ocean from the southern Gulf of St. Lawrence to Cape Hatteras. Surfclam occur in both the state territorial waters (≤ 3 miles from shore) and within the Exclusive Economic Zone (EEZ; 3-200 miles from shore). The ocean quahog is a bivalve mollusk distributed in temperate and boreal waters on both sides of the North Atlantic Ocean. In the Northeast Atlantic, ocean quahog occurs from Newfoundland to Cape Hatteras from depths of about 8 to 400 meters (26 to 1,312 ft). Ocean quahog further north occur closer to shore. The management unit is all Atlantic surfclam (*Spisula solidissima*) and ocean quahog (*Arctica islandica*) in the Atlantic EEZ. The commercial fisheries for surfclam and ocean quahog are fully described in the document titled, "Review of the Atlantic Surfclam and Ocean Quahog Individual Transferable Quota Program. Prepared for Mid-Atlantic Fishery Management Council" (Northern Economics, Inc. 2019; http://www.mafmc.org/council-events/june-2019-council-meeting; "Briefing Materials (Tab 2)." Clam dredges (a bottom tending mobile gear) are utilized in the commercial fisheries for both species. An overview of commercial landings for both species is provided in Table 2 (in section 6.1.1.1.2 below). Information on recent fishing trends are summarized throughout section 6.0. Additional information on these fisheries can be found in Council meeting materials available at: http://www.mafmc.org.

6.1.1.1 Basic Biology

6.1.1.1.1 Atlantic Surfclam

Information on surfclam biology can be found in the document titled, "Essential Fish Habitat Source Document: Surfclam, *Spisula solidissima*, Life History and Habitat Requirements" (Cargnelli et al. 1999a). An electronic version is available at the following website: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-

habitat-efh-northeast. Additional information on this species is available at the following website: http://www.fishwatch.gov. A summary of the basic biology is provided below.

Atlantic surfclam are distributed along the western North Atlantic Ocean from the southern Gulf of St. Lawrence to Cape Hatteras. Surfclam occur in both the state territorial waters (≤ 3 miles from shore) and within the EEZ (3-200 miles from shore). Commercial concentrations are found primarily off New Jersey, the Delmarva Peninsula, and on Georges Bank. In the Mid-Atlantic region, surfclam are found from the intertidal zone to a depth of about 60 meters (197 ft), but densities are low at depths greater than 40 meters (131 ft).

The maximum size of surfclam is about 22.5 cm (8.9 inches) shell length, but surfclam larger than 20 cm (7.9 inches) are rare. The maximum age exceeds 30 years and surfclam of 15-20 years of age are common in many areas. Surfclam are capable of reproduction in their first year of life, although full maturity may not be reached until the second year. Eggs and sperm are shed directly into the water column. Recruitment to the bottom occurs after a planktonic larval period of about three weeks.

Atlantic surfclam are suspension feeders on phytoplankton and use siphons which are extended above the surface of the substrate to pump in water. Predators of surfclam include certain species of crabs, sea stars, snails, and other crustaceans, as well as fish predators such cod and haddock.

6.1.1.1.2 Ocean Quahog

Information on ocean quahog biology can be found in the document titled, "Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Requirements" (Cargnelli et al. 1999b). An electronic version is available at the following website: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast. Additional information on this species is available at the following website: http://www.fishwatch.gov. A summary of the basic biology is provided below.

The ocean quahog is a bivalve mollusk distributed in temperate and boreal waters on both sides of the North Atlantic Ocean. In the Northeast Atlantic, Ocean quahog occur from Newfoundland to Cape Hatteras from depths of about 8 to 400 meters (26 to 1,312 ft). Ocean quahog further north occur closer to shore. The U.S. stock resource is almost entirely within the EEZ (3-200 miles from shore), outside of state waters, and at depths between 20 and 80 meters (66 to 262 ft). However, in the northern range, ocean quahog inhabits waters closer to shore, such that the state of Maine has a small commercial fishery which includes beds within the state's territorial sea (< 3 miles). Ocean quahog burrow in a variety of substrates and are often associated with fine sand.

Ocean quahog are one of the longest-living, slowest growing marine bivalves in the world. Under normal circumstances, they live to more than 100 years old. Ocean quahog of the coast of the U.S. have been aged well in excess of 200 years. Growth tends to slow after age 20, which corresponds to the size currently harvested by the industry (approximately 3 inches). Size and age at sexual maturity are variable and poorly known. Studies in Icelandic waters indicate that 10, 50, and 90 percent of female ocean quahog were sexually mature at 40, 64 and 88 mm (1.5, 2.5 and 3.5 inches) shell length or approximately 2, 19 and 61 years of age. Spawning occurs over a protracted interval

from summer through autumn. Free-floating larvae may drift far from their spawning location because they develop slowly and are planktonic for more than 30 days before settling. Major recruitment events appear to be separated by periods of decades.

Based on their growth, longevity and recruitment patterns, ocean quahog is relatively unproductive and able to support only low levels of fishing. The current resource consists of individuals that accumulated over many decades.

Ocean quahog are suspension feeders on phytoplankton and use siphons which are extended above the surface of the substrate to pump in water. Predators of ocean quahog include certain species of crabs, sea stars, and other crustaceans, as well as fish species such as sculpins, ocean pout, cod, and haddock.

6.1.2 Description of the Stock (Including Status, Stock Characteristics, and Ecological Relationships)

Stock assessment reports are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/population-assessments/northeast-region-stock-assessment-process. Reports with details on stock characteristics and ecological relationships, are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast.

Table 2. Federal Surfclam and Ocean Quahog Quotas and Landings: 1998-2020.

	Surfclam ('000 bushels)			Ocean Quahog ('000 bushels)		
Year	**Landings[a]**	**Quota**	**% Harvested**	**Landings[b]**	**Quota**	**% Harvested**
1998	2,365	2,565	92%	3,946	4,000	99%
1999	2,539	2,565	99%	3,832	4,500	85%
2000	2,566	2,565	100%	3,246	4,500	72%
2001	2,855	2,850	100%	3,763	4,500	84%
2002	3,113	3,135	99%	3,957	4,500	88%
2003	3,241	3,250	100%	4,148	4,500	92%
2004	3,138	3,400	92%	3,892	5,000	78%
2005	2,744	3,400	81%	3,006	5,333	56%
2006	3,057	3,400	90%	3,147	5,333	59%
2007	3,231	3,400	95%	3,431	5,333	64%
2008	2,919	3,400	86%	3,467	5,333	65%
2009	2,602	3,400	77%	3,463	5,333	65%
2010	2,332	3,400	69%	3,587	5,333	67%
2011	2,443	3,400	72%	3,160	5,333	59%
2012	2,341	3,400	69%	3,497	5,333	66%
2013	2,406	3,400	71%	3,245	5,333	61%
2014	2,364	3,400	70%	3,196	5,333	60%
2015	2,354	3,400	69%	3,022	5,333	56%
2016	2,339	3,400	69%	3,079	5,333	58%
2017	2,192	3,400	64%	3,172	5,333	59%
2018	2,110	3,400	62%	3,216	5,333	60%
2019	1,943[c]	3,400	57%	2,460[c]	5,333	46%
2020	NA	3,400	NA	NA	5,333	NA

[a] 1 surfclam bushel is approximately 17 lb. [b] 1 ocean quahog bushel is approximately 10 lb. [c] Preliminary, incomplete 2019 data. NA = Not yet available. Source: NMFS Clam Vessel Logbook Reports.

6.1.2.1 Atlantic Surfclam

The most current assessment of the Atlantic surfclam (*Spisula solidissima*) stock is a management track assessment of the existing 2016 benchmark Stock Synthesis (SS) assessment (SAW 61; NEFSC 2017a). Based on the previous assessment the stock was not overfished, and overfishing was not occurring. This assessment updated commercial fishery catch data, research survey indices of abundance, commercial length composition, survey length composition and conditional age at length data as well as the analytical SS assessment model and reference points through 2019. Stock projections have been updated through 2026.

Based on this updated assessment, the Atlantic surfclam stock is not overfished and overfishing is not occurring (Figures 1-2). Retrospective adjustments were not made to the model results. Spawning stock biomass (SSB) in 2019 was estimated to be 1,222 (’000 mt) which is 119 percent of the biomass target ($SSB_{MSY\ proxy}$ = 1,027; Figure 1). The 2019 fully selected fishing mortality was estimated to be 0.036 which is 25.8 percent of the overfishing threshold proxy (F_{MSY} proxy = 0.141; Figure 2).

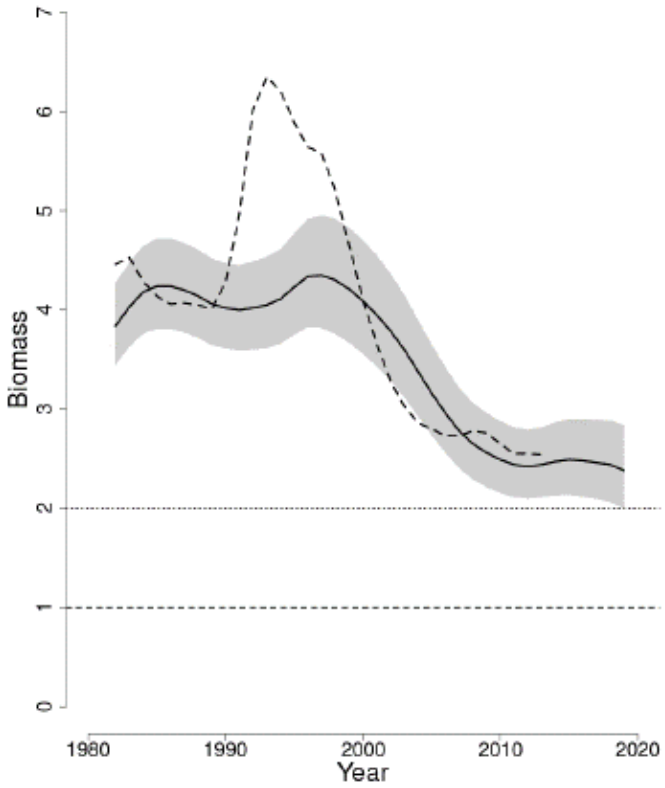


Figure 1. Trends in spawning stock biomass of Atlantic surfclam between 1982 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ (½ $SSB_{MSYproxy}$; horizontal dashed line) as well as SSB_{Target} ($SSB_{MSY\ proxy}$; horizontal dotted line) based on the 2020 assessment. Units of SSB are the ratio of annual biomass to the biomass threshold ($SSB/SSB_{Threshold}$). The approximate 90% lognormal confidence intervals are shown. Source: Hennen, Personal Communication 2020.

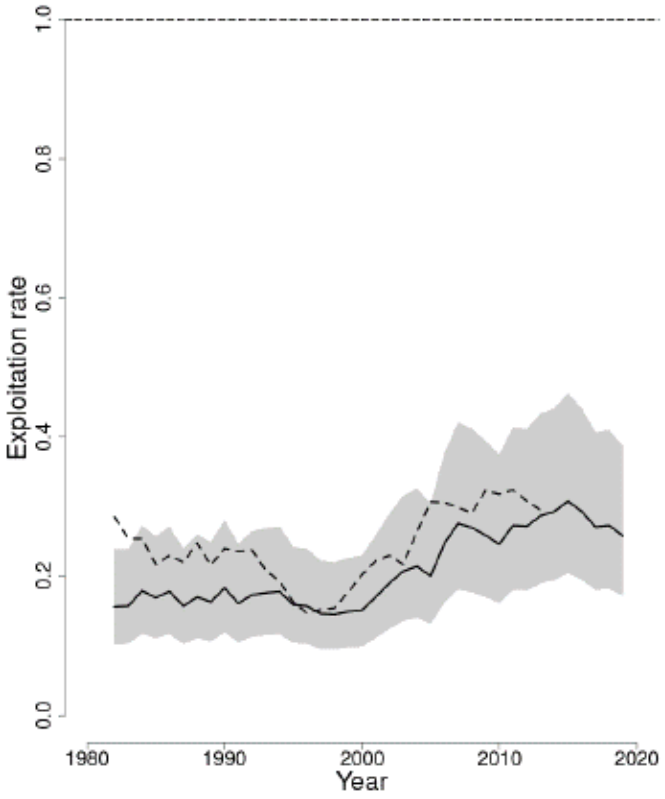


Figure 2. Trends in the fully selected fishing mortality (F_{Full}) of Atlantic surf-clam between 1982 and 2019 from the current (solid line) and previous (dashed line) assessment and the corresponding $F_{Threshold}$ ($F_{MSY\ proxy}$ = 0.141; horizontal dashed line), based on the 2020 assessment. Units of fishing mortality are the ratio of annual F to the F threshold ($F/F_{Threshold}$). The approximate 90% lognormal confidence intervals are shown. Source: Hennen, Personal Communication 2020.

6.1.2.2 Ocean Quahog

The most current assessment of the ocean quahog (*Arctica islandica*) stock is a management track assessment of the existing 2017 benchmark SS assessment (SAW 63; NEFSC 2017b). Based on the previous assessment the stock was not overfished, and overfishing was not occurring. The management track assessment updated commercial fishery catch data, and commercial length composition data, as well as the analytical SS assessment model and reference points through 2019. No new survey data have been collected since the last assessment. Stock projections have been updated through 2026.

Based on this updated assessment, the ocean quahog stock is not overfished and overfishing is not occurring (Figures 3-4). Retrospective adjustments were not made to the model results. SSB in 2019 was estimated to be 3,651 ('000 mt) which is 172.8 percent of the biomass target ($SSB_{MSY\ proxy}$ = 2,113; Figure 3). The 2019 fully selected fishing mortality was estimated to be 0.005 which is 25.5 percent of the overfishing threshold proxy ($F_{MSY\ proxy}$ = 0.019; Figure 4).

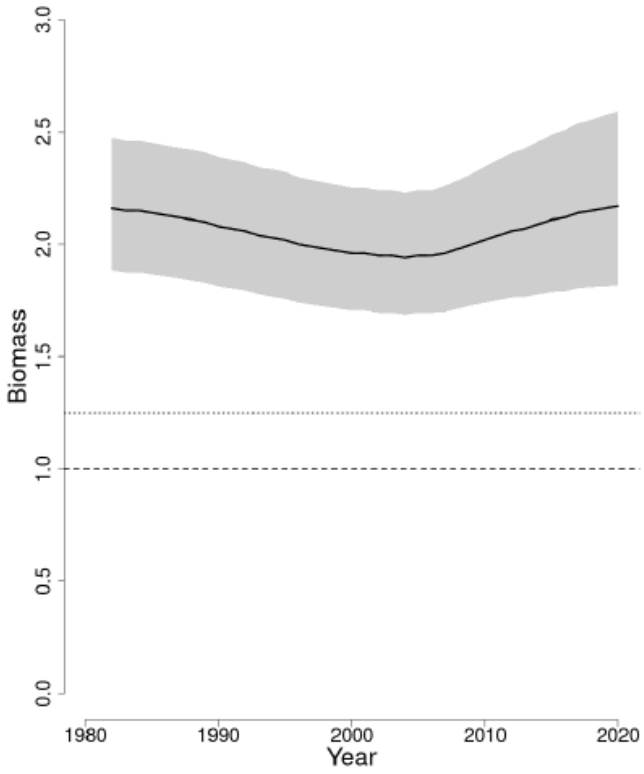


Figure 3. Trends in spawning stock biomass of ocean quahog between 1982 and 2020 from the current (solid line) and previous (dashed line) assessment and the corresponding $SSB_{Threshold}$ (horizontal dashed line) as well as SSB_{Target} ($SSB_{MSY\ proxy}$; horizontal dotted line) based on the 2020 assessment. Units of SSB are the ratio of annual biomass to the biomass threshold ($SSB/SSB_{Threshold}$). The approximate 90% lognormal confidence intervals are shown. Source: Hennen, Personal Communication 2020.

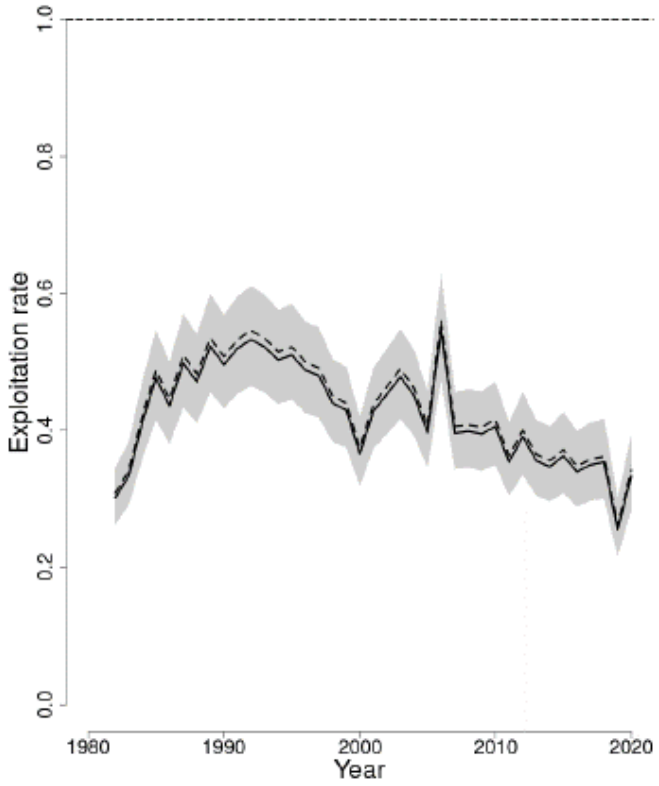


Figure 4. Trends in the fully selected fishing mortality (F_{Full}) of ocean quahog between 1982 and 2020 from the current (solid line) and previous (dashed line) assessment and the corresponding $F_{Threshold}$ ($F_{MSY\ proxy}$ = 0.019; horizontal dashed line), based on the 2020 assessment. Units of fishing mortality are the ratio of annual F to the F threshold ($F/F_{Threshold}$). The approximate 90% lognormal confidence intervals are shown. Source: Hennen, Personal Communication 2020.

6.1.3 Non-Target Species

Non-target species are those species caught incidentally while targeting other species. Non-target species may be retained or discarded.

The estimated bycatch of non-target species by the surfclam and ocean quahog fisheries based on observer data from 2016 was provided by Toni Chute (Personal Communication 2017).

There were 15 observed ocean quahog trips (out of a total of 957 trips, so 1.6 percent of trips were observed) and 28 observed surfclam trips (out of a total of 2,414, so 1.2 percent of trips were observed) in 2016. All species or species categories caught in the dredge, brought on board, and noted and weighed by observers during normal dredging operations are listed in Tables 3 and 4. For the 2016 observed hauls, the protocol for the observers was to stand along the conveyor belt after the catch had passed over the shaker table and move non-target species from the belt into baskets for weight. Bycatch types that were not informative (such as “invertebrate, unclassified”) or inanimate (shell, debris) are not shown. The dominant bycatch species include sea scallops,

skates, monkfish, stargazers, crabs, and snails. The surfclam fishery also discards ocean quahog, and the ocean quahog fishery discards surfclam.

Table 5 shows estimates of total fisheries bycatch/discard in 2016 based on the observer data. The weight of each species caught during observed hauls (including the target species) was totaled, then the amount of each non-targeted species was divided by the amount of target species caught, converted to meat weights, to determine a discard/kept (d/k) ratio for that species. Non-targeted species that were kept in small amounts (usually scallops, monkfish, and flatfish) were treated as discard for the purpose of estimating total bycatch. The d/k ratio for each bycatch species was then multiplied by the total landings of the target species in 2016 in meat weights to estimate bycatch. For example, if the catch from observed surfclam trips totaled 100 tons of surfclam meats and 1 ton of scallops, the calculated d/k ratio for scallops based on observer data would be 0.01 or 1/100. If the surfclam fishery for that year landed 1,000 tons of surfclam meats, then 1,000 tons multiplied by the d/k ratio of 0.01 for scallops estimates that about 10 tons of scallops were caught and discarded by the surfclam fishery. Only the amount of bycatch was estimated, no assumptions were made about discard mortality or incidental mortality. Bycatch species that were estimated to be less than 100 pounds in total over the year are not shown.

It is important to note that specific bycatch types were highly variable. A few hauls where a significant weight of a certain bycatch species was caught influence the annual estimates. Using mean catch per trip of all the bycatch species overestimates total bycatch by assuming all the species are caught in every trip. Tables 6 and 7 list the amounts and types of bycatch reported from individual trips to show variability between trips. In all, ocean quahog contributed with 0.65 percent of the total catch on observed surfclam trips and surfclam contributed with 0.48 percent of the total catch on observed ocean quahog trips.

Table 3. Total weights of species caught during all observed ocean quahog hauls in 2016, and their percentage of both total catch and un-targeted catch.

Ocean quahog fishery			
Number of observed trips	15		
Number of observed hauls	370		
Species caught	**Weight (lbs)**	**% of total catch**	**% of un-targeted catch**
Ocean quahog (round weight)	2,629,292	98.53	
Surfclam (round weight)	12,827	0.48	32.77
Sea scallop	11,612	0.44	29.67
Little skate	6,816	0.26	17.42
Monkfish	3,121	0.12	7.98
Mussel, unclassified	829	0.03	2.12
Winter skate	741	0.03	1.89
Spiny dogfish	656	0.02	1.68
Snail, unclassified	617	0.02	1.58
Striped sea robin	228	0.01	0.58
Summer flounder	189	0.01	0.48
Horseshoe crab	176	0.01	0.45
Cancer crab, unclassified	171	0.01	0.44
Rock crab	167	0.01	0.43
Jonah crab	163	0.01	0.42
Worm, unclassified	161	0.01	0.41
Skate, unclassified	131	0.005	0.34
Crab, unclassified	110	0.004	0.28
Whelk, true, unclassified	79	0.003	0.20
Northern stargazer	45	0.002	0.11
Sponge, unclassified	36	0.001	0.09
Barndoor skate	35	0.001	0.09
Clearnose skate	30	0.001	0.08
Northern sea robin	30	0.001	0.08
Sea star, unclassified	28	0.001	0.07
Smooth dogfish	22	0.001	0.06
American lobster	20	0.001	0.05
Black sea bass	20	0.001	0.05
Skate, little or winter	19	0.001	0.05
Fourspot flounder	12	0.0005	0.03
Windowpane flounder	8	0.0003	0.02
Moon snail	6	0.0002	0.02
Ocean pout	6	0.0002	0.01
Red hake	5	0.0002	0.01
American plaice	4	0.0001	0.01
Bluefish	3	0.0001	0.01
Whelk, unclassified	3	0.0001	0.01
Spotted hake	2	0.0001	0.01
Hermit crab, unclassified	2	0.0001	0.01
Silver hake	2	0.0001	0.004
Yellowtail flounder	1	0.00004	0.003
Winter flounder	1	0.00003	0.002
Scup	1	0.00003	0.002
Chain dogfish	1	0.00003	0.002
Sea raven	1	0.00002	0.001
Stony coral, unclassified	0.4	0.00001	0.001
Eel, unclassified	0.1	0.000004	0.0003
Sea cucumber, unclassified	0.1	0.000004	0.0003

Table 4. Total weights of species caught during all observed surfclam hauls in 2016, and their percentage of both total catch and un-targeted catch.

Surfclam fishery			
Number of observed trips	28		
Number of observed hauls	815		
Species caught	**Weight (lbs)**	**% of total catch**	**% of un-targeted catch**
Surfclam (round weight)	1,845,643	97.50	
Moon snail, unclassified	12,527	0.66	26.51
Ocean quahog (round weight)	12,267	0.65	25.96
Mussel, unclassified	12,007	0.63	25.41
Winter skate	2,737	0.14	5.79
Little skate	2,393	0.13	5.06
Horseshoe crab	1,307	0.07	2.77
Northern stargazer	1,131	0.06	2.39
Rock crab	651	0.03	1.38
Hermit crab, unclassified	618	0.03	1.31
Northern sea robin	351	0.02	0.74
Monkfish	323	0.02	0.68
Sea scallop	294	0.02	0.62
Spiny dogfish	168	0.01	0.36
Snail, unclassified	142	0.01	0.30
Elasmobranch eggs, unclassified	71	0.004	0.15
Summer flounder	60	0.003	0.13
Winter flounder	32	0.002	0.07
Jonah crab	27	0.001	0.06
Striped sea robin	27	0.001	0.06
American lobster	25	0.001	0.05
Channeled whelk	21	0.001	0.04
Windowpane flounder	12	0.001	0.03
Haddock	12	0.001	0.02
Longhorn sculpin	11	0.001	0.02
Sea raven	8	0.0004	0.02
Skate, little or winter	8	0.0004	0.02
Whelk, true, unclassified	5	0.0003	0.01
Ocean pout	4	0.0002	0.01
Lady crab	3	0.0002	0.01
Sea urchin, unclassified	2	0.0001	0.004
Worm, unclassified	2	0.0001	0.004
Anemone, unclassified	1	0.0001	0.003
Sea star, unclassified	1	0.0001	0.003
Stony coral, unclassified	1	0.00004	0.001
Sponge, unclassified	1	0.00003	0.001
Witch flounder	0.4	0.00002	0.001
Sand dollar	0.4	0.00002	0.001

Table 5. Estimated total fishery bycatch in pounds for 2016 by species.

	Ocean quahog fishery	Surfclam fishery
2016 landings (lbs meats)	21,036,293	39,428,066
Estimated total bycatch by species		
American lobster	1,340	2,844
American plaice	251	
Anemone, unclassified		146
Barndoor skate	2,291	
Black sea bass	1,333	
Bluefish	198	
Cancer crab, unclassified	18,550	
Channeled whelk		2,351
Clearnose skate	2,007	
Elasmobranch eggs, unclassified		7,994
Fourspot flounder	799	
Haddock		1,288
Hermit crab, unclassified	132	69,239
Horseshoe crab	11,638	146,371
Jonah crab	10,760	3,034
Lady crab		336
Little skate	449,930	267,919
Longhorn sculpin		1,209
Monkfish	206,046	36,176
Moon snail	422	1,402,531
Mussel, unclassified	54,751	1,344,344
Northern sea robin	1,947	39,344
Northern stargazer	2,971	126,576
Ocean pout	370	448
Ocean quahog (round weight)		1,373,410
Red hake	323	
Rock crab	11,011	72,911
Sea raven	33	896
Sea scallop	766,527	32,929
Sea star, unclassified	1,875	134
Sea urchin		235
Silver hake	106	
Skate unclassified	9,902	896
Smooth dogfish	1,459	
Snail, unclassified	40,743	15,899
Spiny dogfish	43,324	18,821
Sponge, unclassified	2,390	67
Spotted hake	158	
Striped sea robin	15,071	2,978
Summer flounder	12,457	6,673
Surfclam (round weight)	846,732	
Whelk unclassified	5,360	537
Windowpane flounder	508	1,366
Winter flounder	59	3,594
Winter skate	48,882	306,446
Worm, unclassified	10,621	190

Table 6. Observed bycatch by trip, in pounds, surfclam observed trips.

Trip	surfclams (round weight)	all OQ	all snails	all scallops	all teleosts	all elasmobranchs	all other inverts
1	112,615		73		16	193	1
2	69,173				498	164	587
3	108,103		2,973		6	2	13
4	41,987		479	35	5	16	226
5	70,072	614	81	85	94	349	34
6	72,063	5			2	39	60
7	85,307		1,687		9	286	11,945
8	112,862		1,699		363	1,226	7
9	43,973				169	3	29
10	33,276			2	239	6	216
11	8,236	7	5	113	8	1	4
12	21,839				12		14
13	20,323	819	47				3
14	53,223		115		24	69	111
15	36,368				29	22	10
16	38,925	1,213	14	2	34	9	99
17	134,701				9	211	1
18	40,048		1		134	85	97
19	15,781	1,785		31	8		6
20	43,503	2,195	9		5	98	147
21	53,223	4		26	99	68	44
22	141,126		1,634		24	51	27
23	169,700		790			15	
24	55,900		124		6	716	30
25	27,363				3	183	12
26	21,091		21			29	4
27	94,932				4	486	
28	119,930		1,953		2	74	4

Table 7. Observed bycatch by trip, in pounds, ocean quahog observed trips.

trip	ocean quahogs (round weight)	all SC	all snails	all scallops	all teleosts	all elasmos	all other inverts
1	158,148		4	2,081	147	425	25
2	338,278			509	180	456	
3	53,535			1,367	44	82	53
4	272,884			2,169	1,536	1,901	3
5	110,072			116	67	291	310
6	123,579			60	213	169	108
7	182,071	9,392		1,220	136	386	159
8	149,225			182	40	172	15
9	197,666			372	111	439	133
10	214,583			698	248	259	4
11	117,521		79	819	178	857	349
12	102,755		5	188	91	234	18
13	225,707			1,285	199	1,329	661
14	119,578			285	168	26	5
15	263,690	3,434		260	320	1,426	22

Status of Non-Target Species

In this section, the status of the more frequently encountered non-target species that are managed, those that account for 0.1 percent or more of the total catch in surfclam and/or ocean quahog trips, are described here (Tables 3 and 4).

The most recent benchmark stock assessment for sea scallop was completed in July 2014 (NEFSC 2014). This assessment indicated that the sea scallop stock was not overfished, and overfishing was not occurring. According to the 2016 NE Skate Stock Status Update, little skate and winter skate are not overfished and are not subject to overfishing (NEFSC 2017c).[3] The other species listed that constitute more than 0.1 percent of the total catch (e.g., moon snails) have not been assessed; therefore, their overfished and overfishing status is unknown.

6.2 Physical Environment and Essential Fish Habitat (EFH)

The physical, chemical, biological, and geological components of benthic and pelagic environments are important aspects of habitat for marine species and have implications for reproduction, growth, and survival of marine species. The following sections briefly describe key aspects of the physical habitat which may be impacted by the alternatives considered in this document. This information is largely drawn from Stevenson et al. (2004), unless otherwise noted.

6.2.1 Physical Environment

Surfclam and ocean quahog inhabit the northeast U.S. shelf ecosystem, which includes the area from the Gulf of Maine south to Cape Hatteras, extending seaward from the coast to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. The northeast shelf ecosystem includes the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types.

Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents.

The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina.

The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom. The continental shelf in this region 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

[3] 2016 NE Skate Stock Status Update available at: https://s3.amazonaws.com/nefmc.org/4_NEFSC_SkateMemo_July_2017_170922_085135.pdf

ice sheet and the subsequent rise in sea level. Currents and waves have since 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 (2-4 in/s) at the surface and 2 cm/s (1 in/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 (8 in/s) that increases to 100 cm/s (39 in/s) near inlets.

The shelf slopes gently from shore out to between 100 and 200 km (62 and 124 miles) offshore where it transforms to the slope (100-200 m water depth or 328-656 ft) at the shelf break. 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 (33 ft) into the shelf; however, the Hudson Shelf Valley is about 35 m (115 ft) 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 (33 ft), lengths of 10-50 km (6-31 miles) and spacing of 2 km (1 mile). 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 less physically rigorous conditions.

Sand waves are usually found in patches of 5-10 with heights of about 2 m (7 ft), lengths of 50-100 m (164-328 ft) and 1-2 km (0.6-1 mile) 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 percent 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 (20-39 in) 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 (0.4-59 in) 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 (0-33 ft) 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.

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 percent fine on the slope. On the slope, silty sand, silt, and clay predominate (Stevenson et al. 2004).

Greene et al. (2010) identified and described Ecological Marine Units (EMUs) in New England and the Mid-Atlantic based on sediment type, seabed form (a combination of slope and relative depth), and benthic organisms. According to this classification scheme, the sediment composition off New England and the Mid-Atlantic is about 68 percent sand, 26 percent gravel, and 6 percent silt/mud. The seafloor is classified as about 52 percent flat, 26 percent depression, 19 percent slope, and 3 percent steep (Table 8).

Artificial reefs are another significant Mid-Atlantic habitat. These localized areas of hard structure were formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of these materials were 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. 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.

Like all the world's oceans, the western North Atlantic is experiencing changes to the physical environment as a result of global climate change. These changes include warming temperatures; sea level rise; ocean acidification; changes in stream flow, ocean circulation, and sediment deposition; and increased frequency, intensity, and duration of extreme climate events. These changes in physical habitat can impact the metabolic rate and other biological processes of marine species. As such, these changes have implications for the distribution and productivity of many marine species. Several studies demonstrate that the distribution and productivity of several species in the Mid-Atlantic have changed over time, likely because of changes in physical habitat conditions such as temperature (e.g., Weinberg 2005, Lucey and Nye 2010, Nye et al. 2011, Pinsky et al. 2013, Gaichas et al. 2015).

Table 8. Composition of EMUs off New England and the Mid-Atlantic (Greene et al. 2010). EMUs which account for less than 1% of the surface area of these regions are not shown.

Ecological Marine Unit	Percent Coverage
High Flat Sand	13%
Moderate Flat Sand	10%
High Flat Gravel	8%
Side Slope Sand	6%
Somewhat Deep Flat Sand	5%
Low Slope Sand	5%
Moderate Depression Sand	4%
Very Shallow Flat Sand	4%
Side Slope Silt/Mud	4%
Moderate Flat Gravel	4%
Deeper Depression Sand	4%
Shallow Depression Sand	3%
Very Shallow Depression Sand	3%
Deeper Depression Gravel	3%
Shallow Flat Sand	3%
Steep Sand	3%
Side Slope Gravel	3%
High Flat Silt/Mud	2%
Shallow Depression Gravel	2%
Low Slope Gravel	2%
Moderate Depression Gravel	2%
Somewhat Deep Depression Sand	2%
Deeper Flat Sand	1%
Shallow Flat Gravel	1%
Deep Depression Gravel	1%
Deepest Depression Sand	1%
Very Shallow Depression Gravel	1%

6.2.2 Essential Fish Habitat (EFH)

Information on surfclam and ocean quahog habitat requirements can be found in the documents titled, "Essential Fish Habitat Source Document: Atlantic Surfclam, *Spisula solidissima*, Life History and Habitat Characteristics." (Cargnelli et al. 1999a) and "Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Characteristics" (Cargnelli et al. 1999b). Electronic versions of these source documents are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/habitat-conservation/essential-fish-habitat-efh-northeast/. The current designations of EFH by life history stage for surfclam and ocean quahog are provided here:

Atlantic surfclam juveniles and adults: EFH habitat is defined as throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90 percent of all the ranked ten-minute squares for the area where surfclam were caught in the NEFSC surfclam and ocean quahog dredge surveys. Surfclam generally occur from the beach zone to a [water] depth of about 200 feet [61 m], but beyond about 125 feet [38 m] abundance is low.

Ocean quahog juveniles and adults: EFH habitat is defined as throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90 percent of all the ranked ten-minute squares for the area where ocean quahog was caught in the NEFSC surfclam and ocean quahog dredge surveys. Distribution in the western Atlantic ranges in [water] depths from 30 feet [9 m] to about 800 feet [244 m]. Ocean quahog are rarely found where bottom water temperatures exceed 60 ºF [16 ºC] and occur progressively further offshore between Cape Cod and Cape Hatteras.

There are other federally-managed species with life stages that occupy essential benthic habitats that may be susceptible to adverse impacts from hydraulic clam dredges; those can be found in Appendix A as well as the NOAA Fisheries EFH Mapper, which is available at: https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper.

6.2.3 Fishery Impact Considerations

Any actions implemented in the FMP that affect species with overlapping EFH were considered in the EFH assessment for Amendment 13 to the FMP (MAFMC 2003). Surfclam and ocean quahog are primarily landed by hydraulic clam dredges. Section 6.3 includes a detailed description of how NMFS defines clam dredging, so as not to be confused with dredging for other purposes (i.e., widening navigation channels, etc.). Amendment 13 included alternatives to minimize the adverse impacts of fishing gear on EFH (as required pursuant to Section 303(a)(7) of the MSA). As stated in section 2.2 of Amendment 13, the prime habitat of surfclam and ocean quahog consists of sandy substrates with no vegetation or benthic 'structures' that could be damaged by the passing of a hydraulic dredge. In these 'high energy' environments, it is thought that the recovery time following passage of a clam dredge is relatively short. Because of the potential that the fisheries adversely impact EFH for a number of managed species, eight action alternatives (including closed area alternatives) for minimizing those impacts were considered by the Council in Amendment 13.

A panel of experts who participated in a 2001 workshop to evaluate the potential habitat impacts of fishing gears used in the Northeast region concluded that there are potentially large, localized impacts of hydraulic clam dredges on the biological and physical structure of sandy benthic habitats (Northeast Region Essential Fish Habitat Steering Committee 2002). The Council concluded in Amendment 13 that there may be some adverse effects of clam dredging on EFH, but concurred with the workshop panel that the effects are short-term and minimal because the fisheries occurs in a relatively small area (compared to the area impacted by scallop dredges or bottom trawls) and primarily in high energy sand habitats. The panel concluded that biological communities would recover within months to years (depending on what species was affected) and physical structure within days in high energy environments to months in low energy environments. The preamble to the EFH Final Rule (January 17, 2002; 67 FR 2343) defines temporary impacts as those that are limited in duration and that allow the particular environment to recover without measurable impact.

Additionally, at the time that workshop was held, the overall area impacted by the clam fisheries was relatively small (approximately 100 square nautical miles or 343 Km^2), compared to the large area of high energy sand on the continental shelf. The closed area alternatives that were considered in Amendment 13 were analyzed for their biological, economic, and social impacts, but given the results of the gear effects analysis in that document (summarized above), the Council concluded that none of them were necessary or practicable. Since 2003, when

Amendment 13 was implemented, the area open to surfclam and ocean quahog harvesting has expanded to include a large area on Georges Bank that had previously been closed since 1990 due to the presence of the toxin that causes paralytic shellfish poisoning (PSP) in the tissues of surfclam and ocean quahog (NMFS 2012 and 2013). As such, a portion of the fishing effort now operates on Georges Bank and the gear is now being used on more complex, hard-bottom habitats (e.g., Nantucket Shoals) than was the case in 2003. The habitat impact analysis conducted by the NMFS concluded that the adverse impacts of renewed clam dredging on the shoals of Georges Bank would be minimal and/or temporary as long as dredging was confined to the shallower, more dynamic sandy bottom habitats (e.g., East Shoal, North Shoal, Southwest Shoal, Cultivator, etc.) which were the only areas where it was believed that the gear could be efficiently operated.

A portion of the following discussion is excerpted from the NEFMC's (New England Fishery Management Council) Omnibus EFH Amendment 2 (OHA2) which implemented measures designed to minimize to the extent practicable the adverse effects of fishing on essential fish habitat.[4] The OHA2 employed a spatial explicit model (SASI = Swept Area Seabed Impact) to estimate habitat vulnerability incorporating gear-specific susceptibility (S) and recovery (R) scores for a number of geological and biological habitat features in various subtracts.

Hydraulic clam dredges have been used in the surfclam fishery for over five decades and in the ocean quahog fishery since its inception in the early 1970s. These dredges are highly sophisticated and are designed to: 1) be extremely efficient (80 to 95 percent capture rate); 2) produce a very low bycatch of other species; and 3) retain very few undersized clams (Northeast Region Essential Fish Habitat Steering Committee 2002).

The typical dredge is 12 feet (4 m) wide and about 22 feet (7 m) long and uses pressurized water jets to wash clams out of the seafloor. Towing speed at the start of the tow is 2.5 knots and declines as the dredge accumulates clams. The dredge is retrieved once the vessel speed drops below 1.5 knots, which can be only a few minutes in very dense beds. However, a typical tow lasts about 15 minutes. The water jets penetrate the sediment in front of the dredge to a depth of about 8 – 10 inches (20 - 25 cm), depending on the type of sediment and the water pressure. The water pressure that is required to fluidize the sediment varies from 50 pounds per square inch (psi) in coarse sand to 110 psi in finer sediments. The objective is to use as little water as possible since too much pressure will blow sediment into the clams and reduce product quality. The "knife" (or "cutting bar") on the leading bottom edge of the dredge opening is 5.5 inches (14 cm) deep for surfclam and 3.5 inches (9 cm) for ocean quahog. The knife "picks up" clams that have been separated from the sediment and guides them into the body of the dredge ("the cage"). If the knife size is not appropriate, clams can be cut and broken, resulting in significant mortality of clams left on the bottom. The downward pressure created by the runners on the dredge is about 1 psi (Northeast Region Essential Fish Habitat Steering Committee 2002).

In the SASI model, susceptibility and recovery were only evaluated for hydraulic clam dredges for sand and granule-pebble substrates because at the time it was believed that this gear could not be operated in mud or in rocky habitats (Northeast Region Essential Fish Habitat Steering Committee 2002, Wallace and Hoff 2005). In the absence of much published information on the degree to which benthic habitat features are susceptible to this gear, professional judgment

[4] Available at: https://www.nefmc.org/library/omnibus-habitat-amendment-2

relied on the presumption that these dredges have a more severe immediate impact on surface and sub-surface habitat features than other fishing gears used in the Northeast region.

In the SASI model analysis, hydraulic dredges were given higher vulnerability scores than otter trawls and scallop dredges in sand and small gravel (granule-pebble) substrates, and much higher vulnerability scores than the fixed gears. Across all gears, geological and biological features were generally most susceptible to impacts from hydraulic dredges as compared to other gear types (average scores for all features in a particular substrate and energy environment ranged from 2.5-2.8 out of 3). Average otter trawl and scallop dredge S scores (susceptibility score) ranged from 1.0 to 2.0. Higher S scores reflect a higher proportion of features with > 25 percent encountered estimated to have a reduction in functional habitat value. For trawls and scallop dredges, there was a larger proportion of high S scores (S = 2 or 3) for geological features, especially in mud and cobble, than for biological features; for hydraulic dredges, however, there was very little difference between feature classes.

Geological feature recovery values were slightly higher (i.e., longer recovery) for hydraulic dredges than for the other two mobile gears (i.e., otter trawl and scallop dredges) fished in similar habitats (sand and granule-pebble). Average recovery values were more similar for biological features across the three mobile gear types, although in a few cases estimated recovery times were longer for hydraulic dredge gear. This was due to differences in gear effects associated with hydraulic dredges as compared to scallop dredges or otter trawls.

Based on the results of the SASI model, the OHA2 implemented mobile bottom-tending gear prohibitions throughout various habitat management areas (HMAs) selected by the NEFMC (Figures 5-6). In addition, the OHA2 included indefinite exemptions for hydraulic clam dredges in many of the HMAs and a temporary exemption for the Great South Channel HMA for a year after implementation of OHA2 to allow time for the NEFMC to consider creating access areas within this HMA. (A temporary exemption in the Georges Shoal HMA was also approved by the Council, but this proposed HMA was subsequently disapproved by NOAA). The approved HMAs included: (a) establishing new HMAs in Eastern Maine and on Fippennies Ledge where mobile bottom-tending gear is prohibited, (b) maintaining the Cashes Ledge Groundfish Closure Area with current restrictions and exemptions, (c) modifying both the Cashes Ledge and Jeffreys Ledge Habitat Closure Areas, which are closed to mobile bottom-tending gear, (d) prohibiting all fishing gear except lobster pots in the Ammen Rock Area, (e) maintaining the Western Gulf of Maine (WGOM) Habitat Closure Area, which is closed to mobile bottom-tending gear, (f) aligning the boundaries of the WGOM Groundfish Closure Area to match the WGOM Habitat Closure Area, (g) exempting shrimp trawling from the northwest corner of the WGOM areas, (h) identifying the existing Gulf of Maine Roller Gear restriction as a habitat protection measure, and (i) prohibiting the use of mobile bottom-tending gear in the Great South Channel HMA, subject to the outcome of subsequent clam dredge exemption actions by the Council and NOAA.[5]

As indicated above, the surfclam and ocean quahog fisheries were granted a one-year exemption (which expired on April 8, 2019) for the Great South Channel HMA following implementation of OHA2. In subsequent actions, the NEFMC considered possible clam dredge exemptions in several areas within the Great South Channel HMA that are currently fished and may be suitable for a hydraulic clam dredging exemption that balances achieving optimum yield for the surfclam and ocean quahog fisheries with the requirement to minimize adverse

[5] Source: NMFS Approves "Majority" of Council's Habitat Amendment

fishing effects on habitat to the extent practicable and is consistent with the underlying objectives of OHA2. The Clam Dredge Framework Action was submitted to NMFS and was approved by NOAA on May 19, 2020, and became effective on June 18, 2020. It established exemptions for clam and mussel dredges in two year-round access areas within the HMA and seasonal access in a third area (Figure 6).[6]

[6] For additional information see: https://www.nefmc.org/library/clam-dredge-framework

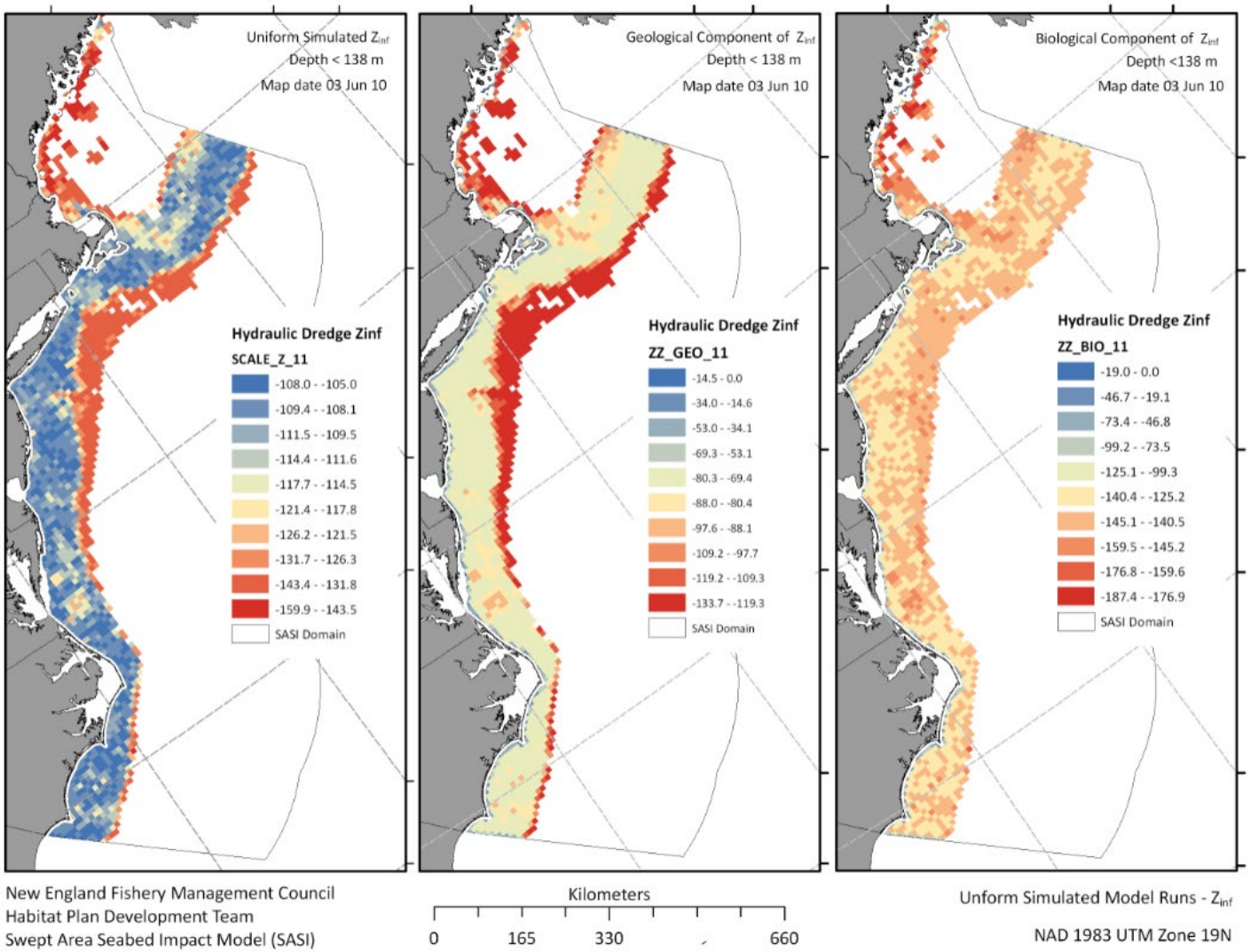


Figure 5. Simulation outputs ($Z\infty$) for hydraulic dredge gear (left panel shows combined vulnerability of geological (mid-panel) and biological features (right-panel); blue = low vulnerability, red = high vulnerability).
Source: https://www.nefmc.org/library/omnibus-habitat-amendment-2

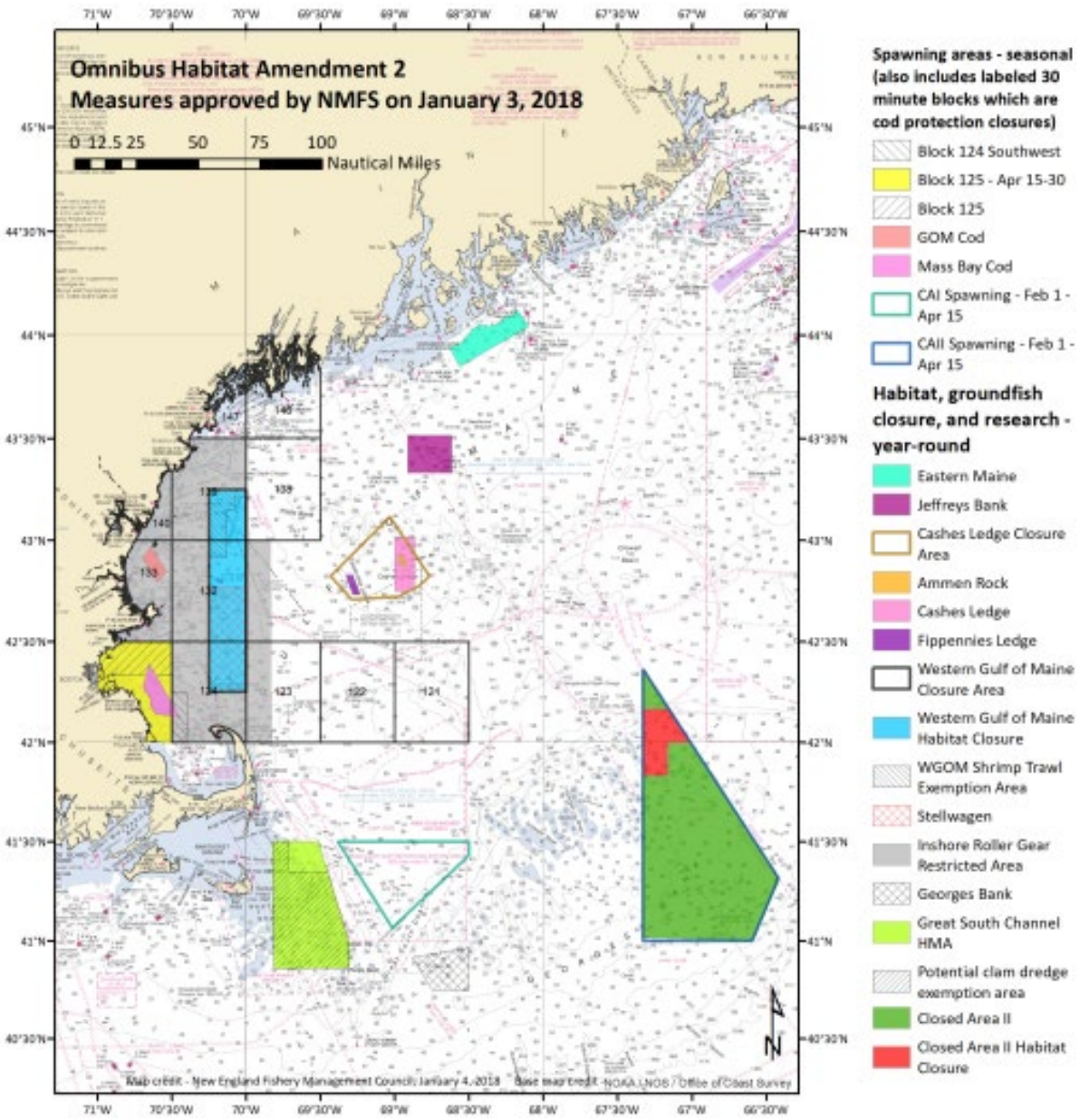


Figure 6. OHA2 approved regulations.
Source: NMFS Approves "Majority" of Council's Habitat Amendment

6.3 ESA and MMPA Protected Species

Numerous protected species inhabit the affected environment of the Atlantic Surfclam and Ocean Quahog FMP (Table 9; Hayes et al. 2017). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the MMPA of 1972. More detailed description of the species listed in Table 9, including their environment, ecological relationships and life history information including recent stock status, are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/protecting-marine-life-new-england-mid-atlantic and http://www.nmfs.noaa.gov/pr/sars/region.htm.

Cusk is a NMFS "candidate species" under the ESA. Candidate species are those petitioned species for which NMFS has determined that listing may be warranted under the ESA and those species for which NMFS has initiated an ESA status review through an announcement in the FR. If a species is proposed for listing the conference provisions under Section 7 of the ESA apply (50 CFR §402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, cusk will not be discussed further in this and the following sections; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed action. Additional information on cusk can be found at:
https://fisheries.noaa.gov/species/cusk.

6.3.1 Species and Critical Habitat Not Likely to be Affected by the Proposed Action

The commercial fisheries for surfclam and ocean quahog are prosecuted with hydraulic clam dredges, a type of bottom tending mobile gear. Based on the best available information, this gear type is not expected to pose an interaction risks to any protected species. Since 1989, the date of NMFS' earliest observer records for federally managed fisheries, there has been no observed or documented interactions between gear used in the surfclam and ocean quahog fishery and any ESA-listed or MMPA protected species; as a result, no take is anticipated or exempted for this fishery (NMFS 2020; NMFS Observer Program, unpublished data; see http://www.nmfs.noaa.gov/pr/sars/region.htm; and https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries). Based on this and the best available information, it has been determined that this action is not likely to adversely affect protected species (ESA-listed and/or MMPA protected; see Table 9). This determination was made because either the occurrence of the species is not known to overlap with the surfclam and ocean quahog commercial fisheries (http://seamap.env.duke.edu/; https://www.fisheries.noaa.gov/species-directory) and/or, as noted above, there have never been observed or documented interactions between the species and the primary gear type (i.e., clam dredge) used to prosecute the fisheries.

As provided in Table 9 and Figure 8, North Atlantic right whale critical habitat also occurs in the affected environment of the surfclam/ocean quahog FMP. This action is not likely to adversely affect North Atlantic right whale critical habitat. This determination has been made because the surfclam and ocean quahog fisheries will not affect the essential physical and biological features of North Atlantic right whale critical habitat and, and therefore, will not result in the destruction

or adverse modification of this species critical habitat (NMFS 2015a,b). Support for this determination is provided in the discussion below.

Critical habitat is habitat that contains physical and biological features essential to the conservation of the species. For right whales, it contains the features essential for successful foraging, calving, and calf survival (NMFS 2015a). Although comprised of two areas, only the area in the Gulf of Maine and Georges Bank region (Unit 1) overlaps with the affected environment of the proposed action.

The boundaries of Unit 1 were defined by the distribution, aggregation and retention of *Calanus finmarchicus*, the primary and preferred copepod prey of North Atlantic right whales, (NMFS 2015a,b). The essential physical features include prevailing currents, bathymetric features (such as basins, banks, and channels), oceanic fronts, density gradients, and flow velocities. The essential biological features include aggregations of copepods, preferably late stage *C. finmarchicus*, in the Gulf of Maine and Georges Bank region, as well as aggregations of diapausing (overwintering) populations in the deep basins of the region. NMFS (2015a,b) identified activities that may destroy or adversely modify these essential features; navigational dredging (termed "dredging") and commercial fisheries were amongst the activities analyzed and determined to not likely impact the identified foraging area physical or biological features.

"Dredging" as defined in NMFS's assessment (NMFS 2015a; 81 FR 4838, January 27, 2016) should not be confused with dredging using commercial fishing dredges, such as those used in the surfclam/ocean quahog FMP. In the assessment, dredging is in reference to the removal of material from the bottom of water bodies to deepen, widen or maintain navigation corridors, anchorages, or berthing areas, as well as sand mining (NMFS 2015a). Dredges typically used for navigational deepening or sand mining operations include hopper and cutterhead dredges. Although dredge size varies by location, hydraulic hopper dredges have draghead widths from a few feet to 12 feet; cutterhead diameters typically range from 16-20 inches (maximum 36 inches). These dredges disturb the sediment surface (down to 12 or more inches) creating turbidity plumes that last up to a few hours. In contrast, the surfclam/ocean quahog fishery uses hydraulic dredges to capture shellfish by injecting pressurized water into the sediment to a depth of 8-10 inches, creating a trench up to 30 cm deep and as wide as the dredge (approximately 12 feet) (Northeast Region Essential Fish Habitat Steering Committee 2002; see section 5.2.1 and Appendix B of that document).

Navigational/sand mine dredging has not been found to limit the recovery of North Atlantic right whale (NMFS 2017c) or their critical habitat (NMFS 2015a). There is no evidence to suggest that this conclusion does not also hold true for dredging associated with commercial fishing operations. In terms of the surfclam/ocean quahog fishery, the scale and scope of hydraulic clam or mussel dredges is smaller than that associated with navigational/sand mining dredges. Turbidity created from such fishing dredges will be temporary in nature and will not impact the long-term viability of copepod aggregations. Fishing dredges, such as hydraulic clam, may also temporarily disturb localized copepod concentrations; however, these localized patches are continually replaced and/or shifting due to the dynamic oceanographic features of the Gulf of Maine (e.g., strong current, sharp frontal gradients, high mixing rates) that have a large effect on the distribution, abundance, and concentration of zooplankton populations within the Gulf of Maine (NMFS 2015b). As provided

above, one of the essential biological features of Unit 1 include aggregations of diapausing (overwintering) *C. finmarchicus* populations in the deep basins (i.e., Jordan, Wilkinson, and Georges Basins) of the Gulf of Maine/Georges Bank Region. These basins provide refugia for diapausing populations of *C. finmarchicus* and serve as source populations for the annual recruitment of copepods into the Gulf of Maine population (Davis 1987, Meise and O'Reiley 1996, Lynch et al. 1998, Johnson et al. 2006). In late winter, diapausing *C. finmarchicus* emerge from their dormant state and migrate to the surface layer where they are transported/advected to other areas within the Gulf of Maine by prevailing circulation patterns (Davis 1987, Baumgartner et al. 2007, Lynch et al. 1998, Johnson et al. 2006). Depending on where copepods are transported, concentrated patches of copepods within the Gulf of Maine and GB region will be variable, both spatially and seasonally. Due to the dynamic physical oceanographic features of the Gulf of Maine and GB, copepods will continuously be advected from the deep ocean basins to areas throughout the Gulf of Maine and GB region. As hydraulic clam dredges do not operate in the deep basins of the Gulf of Maine /GB, these fishing gears will not affect or disrupt diapausing *C. finmarchicus* populations that are essential for populating the Gulf of Maine and George's Bank with right whales' preferred prey source. Based on this, although operation of the surfclam/ocean quahog FMP within regions of the Gulf of Maine or GB have the potential to cause temporary and localized disturbances of aggregations of copepods, it will not result in the permanent removal of the forage base necessary for right whale recovery. In addition, operation of hydraulic clam will not have any potential to affect the essential physical oceanographic features (i.e., currents, temperature, bathymetry) of Unit 1.

Taking into consideration the above, the operation of the surfclam/ocean quahog fisheries will not affect the essential physical and biological features of North Atlantic right whale critical habitat and, therefore, will not result in the destruction or adverse modification of this species critical habitat (NMFS 2015a,b). Based on this, the proposed action does not meet the adverse modification threshold and is not expected to impact right whale recovery.

Table 9. Species Protected Under the ESA and/or MMPA that may occur in the affected environment of the Atlantic surfclam and ocean quahog fisheries. Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks.

Species	Status	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	*Endangered*	No
Humpback whale, West Indies DPS (Megaptera novaeangliae)	Protected (MMPA)	No
Fin whale (Balaenoptera physalus)	*Endangered*	No
Sei whale (Balaenoptera borealis)	*Endangered*	No
Blue whale (Balaenoptera musculus)	*Endangered*	No
Sperm whale (Physeter macrocephalus	*Endangered*	No
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	No
Pilot whale (Globicephala spp.)[1]	*Protected (MMPA)*	No
Risso's dolphin (*Grampus griseus*)	Protected (MMPA)	No
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected (MMPA)	No
Short Beaked Common dolphin (*Delphinus delphis*)[2]	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[3]	*Protected (MMPA)*	No
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	No
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	No
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	No
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)	Threatened	No
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	No
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	No
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	No
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	No
Cusk (*Brosme brosme)*	Candidate	No
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected (MMPA)	No
Gray seal (*Halichoerus grypus*)	Protected (MMPA)	No
Harp seal (*Phoca groenlandicus*)	Protected (MMPA)	No
Hooded seal (*Cystophora cristata*)	Protected (MMPA)	No
Critical Habitat		
North Atlantic Right Whale	ESA (Protected)	No

[1] Due to the difficulties in discriminating short finned (*G. melas melas*) and long finned (*G. macrorhynchus*) pilot whales at sea, they are often just referred to as *Globicephala spp*.
[2] Called "common dolphin" before 2008.
[3] Includes the Western N. Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks.
DPS = distinct population segment.

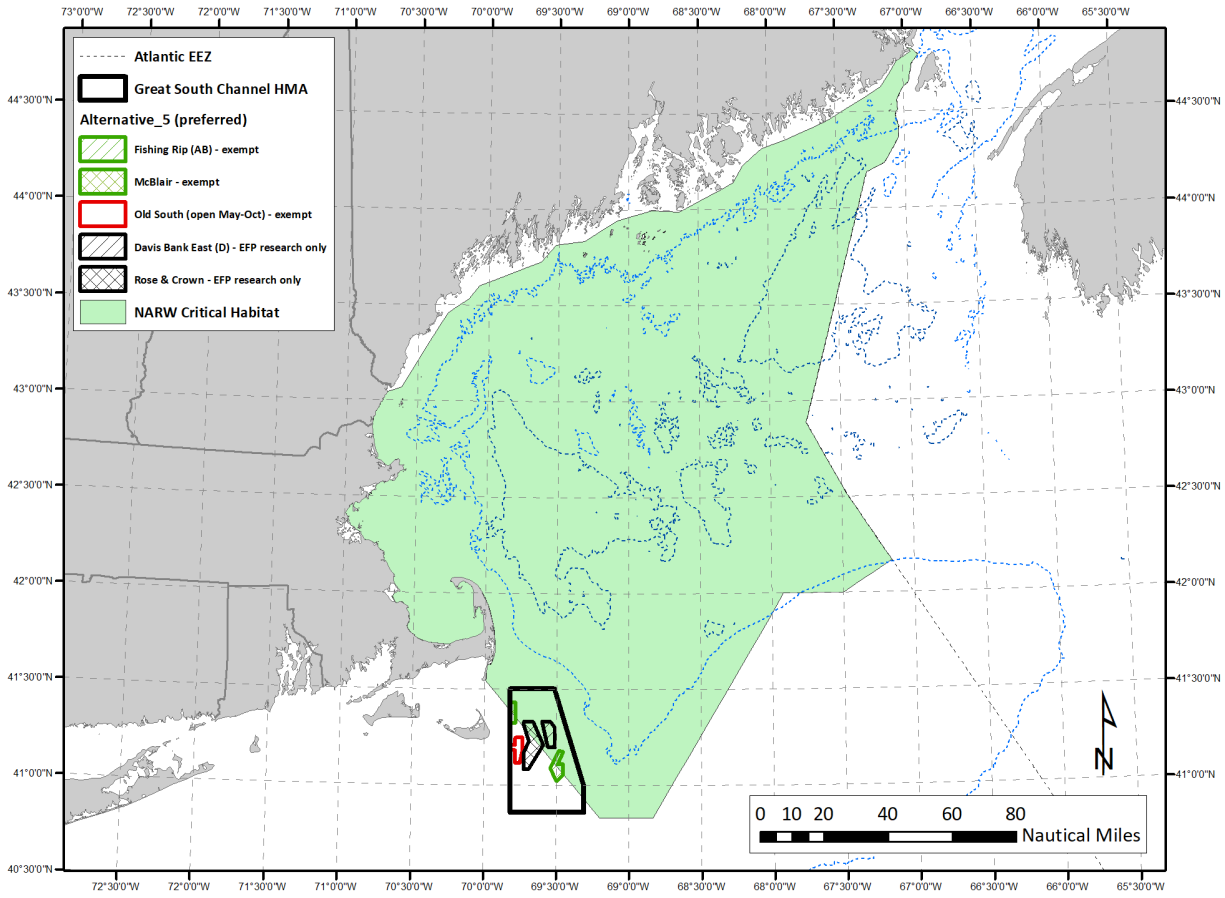


Figure 7. North Atlantic Right Whale Critical Habitat in the Gulf of Maine, GSC HMA. Additional areas of critical habitat are designated along the coasts of South Carolina, Georgia, and Florida, but are not shown here.

6.4 Human Communities

When Amendment 13 to the FMP was developed, the Council hired Dr. Bonnie McCay and her associates at Rutgers University to describe the ports and communities that are associated with the surfclam and ocean quahog fisheries. The researchers did an extensive job characterizing the three main fisheries (non-Maine ocean quahog, Maine ocean quahog, and surfclam). The McCay team characterizations of the ports and communities are based on government census and labor statistics and on observations and interviews carried out during the late 1990s and in the fall of 2001. The description of the fishing gear, areas fished at that time, etc. are fully described in Amendment 13. Communities from Maine to Virginia are involved in the harvesting and processing of surfclam and ocean quahog (MAFMC 2003). At present, surfclam and ocean quahog are occasionally landed in Ocean City, MD. Landings in Ocean City used to be significant but is no longer. Cape May and Wildwood, NJ are no longer significant either. Most of the fleet is fishing out of Pt. Pleasant and Atlantic City, NJ, Oceanview, NY, Hyannis, MA (surfclam only), and New Bedford and Fairhaven, MA. Trucking costs and the distance needed to travel to harvest clams has put greater economy on scale and location (Surfclam and Ocean Quahog Advisory Panel 2020). The small scale Maine fishery is entirely for ocean quahog, which are sold as shellstock for the half-shell market (MAFMC 2018b). The other fisheries are industrialized ones for surfclam and ocean

quahog, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products (MAFMC 2018a,b).

Additional information on "Community Profiles for the Northeast U.S. Fisheries" can be found at: https://www.nefsc.noaa.gov/read/socialsci/communitySnapshots.php. In addition, Fishery Performance Reports prepared by industry advisors, provide additonal information on the social and economic environments from the industry members perspectives and are available at: http://www.mafmc.org. Recent trends in the fisheries are presented below and in Fishery Information Documents also available on the Council website.

6.4.1 Fishery Descriptions

6.4.1.1 Atlantic Surfclam

In 2019, about 1.9 million bushels of surfclam were landed, slightly lower than 2018 at 2.1 million bushels (Table 2). The average ex-vessel price of surflcams reported by processors was $14.37 in 2019, slightly higher than the $14.18 per bushel seen in 2018. The total ex-vessel value of the 2019 federal harvest was approximately $28 million, slightly lower than $30 million in 2018. Industry has described several factors that have affected their industry, including reduction in product marketing/advertisement (e.g., clam chowder), limited markets, and competition from imported clams that are available from a relatively large number of countries, including Canada, Thailand, Vietnam, China, and Chile (MAFMC 2009, MAFMC 2010, MAFMC 2013; Mitchell et al. 2011). Trips harvesting surfclam have increased in length as catch rates have declined.

Area Closures

Areas can be closed to surfclam fishing if the abundance of small clams in an area meets certain threshold criteria. This small surfclam closure provision was applied during the 1980's with three area closures (off Atlantic City, NJ, Ocean City, MD, and Chincoteague, VA), with the last of the three areas reopening in 1991.

Fishing areas can also be closed for public health related issues due to environmental degradation or the toxins that cause PSP. PSP is a public health concern for surfclam. PSP is caused by saxitoxins, produced by the alga *Alexandrium fundyense* (red tide). Surfclam on Georges Bank were not fished from 1990 to 2008 due to the risk of PSP. There was light fishing on Georges Bank in years 2009-2011 under an exempted fishing permit and Landings Per Unit Effort (LPUE) in that area was substantially higher (5-7 times higher) than in other traditional fishing grounds. However, in recent years, the LPUE from Georges Bank has decreased considerably (344 bu/hr in 2009 to 75 bu/hr in 2019).

The Greater Atlantic Regional Fisheries Office reopened a portion of Georges Bank to the harvest of surfclam and ocean quahog beginning January 1, 2013 (77 FR 75057, December 19, 2012) under its authority in 50 CFR 648.76. Harvesting vessels must adhere to the adopted testing protocol from the National Shellfish Sanitation Program.

OHA2 implemented measures that restricted access to the Great South Channel and Georges Shoal Habitat Management Areas. NOAA published a final rule on May 19, 2020 that allows the surfclam fishery to operate hydraulic dredge gear year-round in two small areas (McBlair and Fishing Rip) and seasonally in a third area (Old South) within the Great South Channel HMA. Mussel dredge fishing is also be allowed in these areas.

6.4.1.2 Ocean Quahog

Catch rates for ocean quahog have remained relatively stable overall. However, in the southern parts of the mid-Atlantic, trips harvesting ocean quahog have increased in length as catch rates have declined steadily.

The average ex-vessel price of non-Maine ocean quahog reported by processors in 2019 was $7.86 per bushel, slightly higher than the 2018 price ($7.53 per bushel). In 2019, about 2.5 million bushels of non-Maine ocean quahog were landed, a decline from 3.2 million bushels in 2018. The total ex-vessel value of the 2019 federal harvest outside of Maine was approximately $19 million, lower than the $24 million in 2018.

In 2019, the Maine ocean quahog fleet harvested a total of 23,397 Maine bushels, an 81 percent decrease from the 124,839 bushels harvested in 2006, and a 21 percent decrease from the prior year (2018; 29,447 bushels). Average prices for Maine ocean quahog had declined substantially over time but have recently show an increasing trend. In 2003, there were very few trips that sold for less than $37.00 per Maine bushel, and the mean price was $40.66. Prices have since been lower. In 2019, the mean price was $38.24 per Maine bushel. The value of the 2019 harvest reported by the purchasing dealers totaled $0.89 million, a decrease of 15 percent when compared to 2018 ($1.05 million).

6.4.2 Description of the Areas Fished

A detailed description of the areas fished by the fisheries for surfclam and ocean quahog was presented in the document titled “Review of the Atlantic Surfclam and Ocean Quahog Individual Transferable Quota Program. Prepared for Mid-Atlantic Fishery Management Council” (Northern Economics, Inc. 2019). The commercial fishery for surfclam in Federal waters is prosecuted with large vessels and hydraulic dredges. The distribution of the fishery as catch and landings per unit effort (LPUE) is shown in Figures 8-9. Landings, fishing effort, and LPUE (bu per hour fished) shifted north after 2000 as fishery productivity in the south declined; most of the landings are presently coming from areas off of New Jersey, Southern New England, and Georges Bank. The commercial fishery for ocean quahog in Federal waters is prosecuted with large vessels and hydraulic dredges, and is very different from the small Maine fishery prosecuted with small vessels (35-45 ft).

6.4.3 Port and Community Description

Communities from Maine to Virginia are involved in the harvesting and processing of surfclam and ocean quahog. Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City and Point Pleasant, New Jersey, and New Bedford, Massachusetts. Most of the fleet is fishing out of Pt. Pleasant and Atlantic City, NJ, Oceanview, NY, Hyannis, MA

(surfclam only), and New Bedford and Fairhaven, MA. There are also landings in Ocean City, Maryland, and the Jonesport and Beals Island areas of Maine. The small scale Maine fishery is entirely for ocean quahog, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclam and ocean quahog, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products.

Additional information on "Community Profiles for the Northeast U.S. Fisheries" can be found at: https://www.nefsc.noaa.gov/read/socialsci/communitySnapshots.php and in Northern Economics, Inc. (2019).

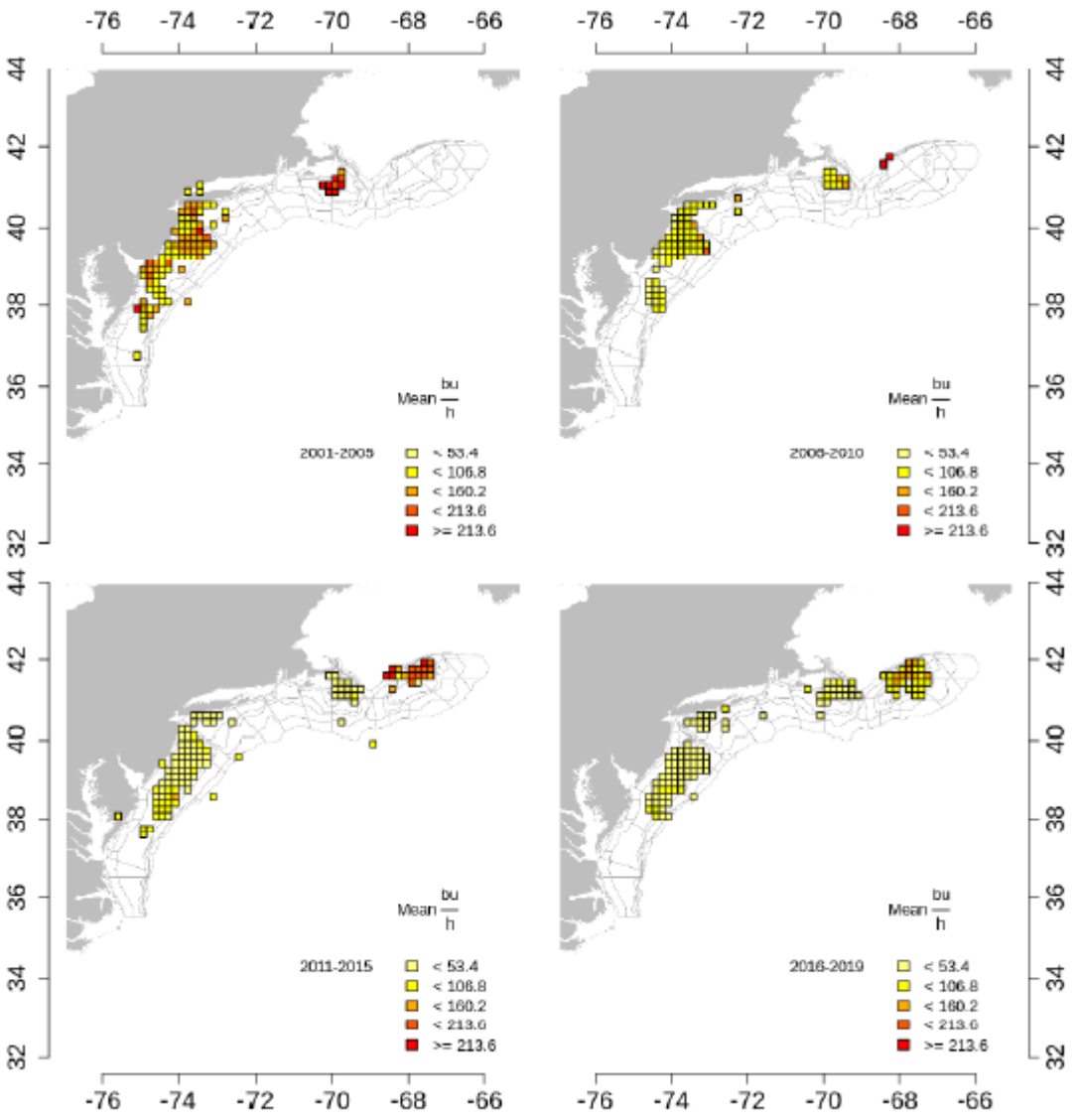


Figure 8. Average surfclam landings per unit effort (bu h-1) by ten-minute squares over time, 2001-2018 and preliminary 2019. Only squares where more the 5 kilo bushels were caught are shown. Source: Hennen, Personal Communication 2020.

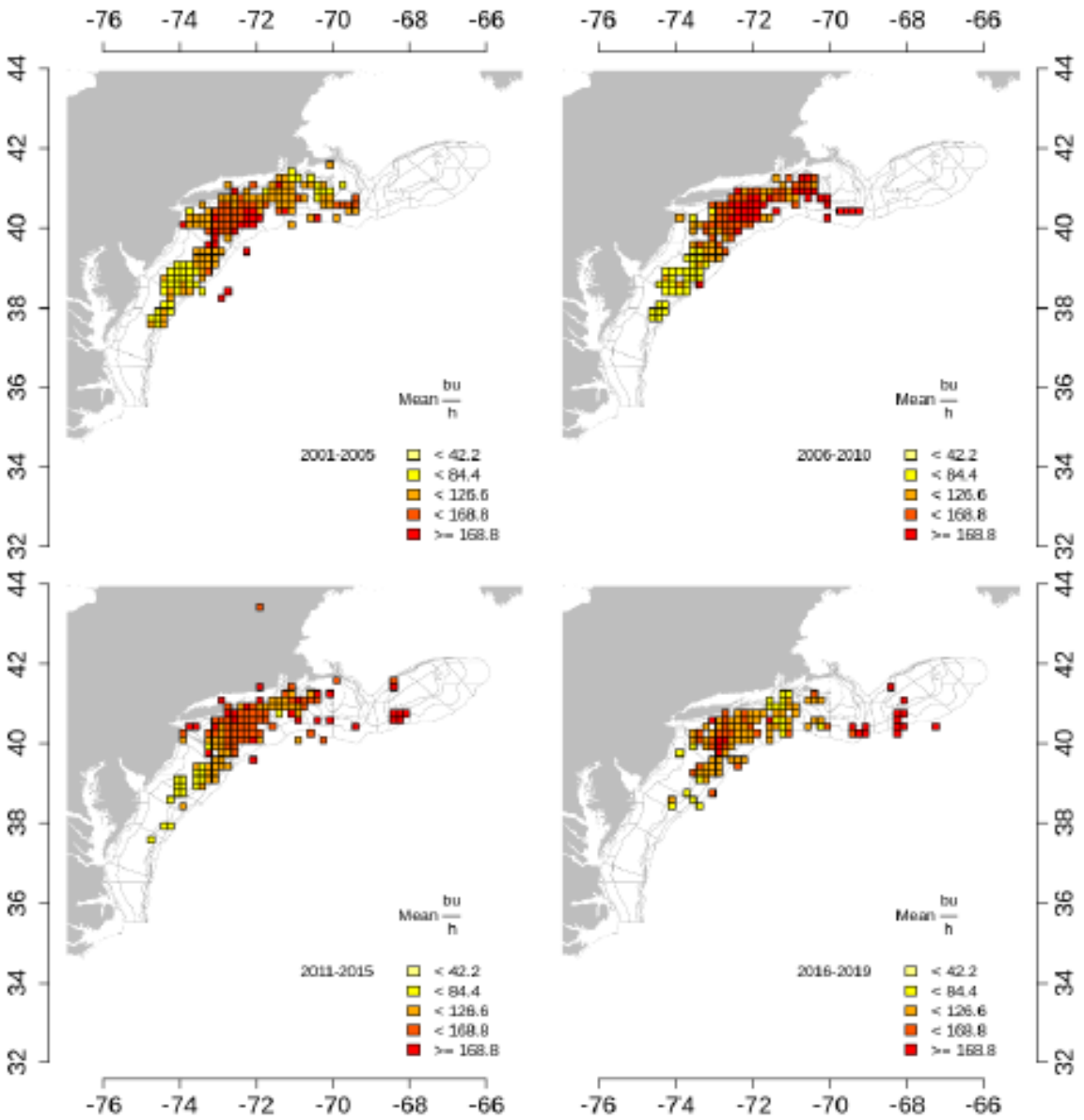


Figure 9. Average ocean quahog landings by ten-minute squares over time, 1981-2018, and preliminary 2019. Only squares where more the 5 kilo bushels were caught are shown. Source: Hennen, Personal Communication 2020.

6.4.4 Vessels and Dealers

Vessels

The total number of vessels participating in the surfclam fishery has remained relatively stable from 2006-2019, ranging from 29 vessels in 2006 to 43 vessels in 2019,[7] with vessels shifting between harvesting surfclam or surfclam and ocean quahog (Table 10). The total number of vessels participating in the ocean quahog fisheries outside the state of Maine has experienced a downward trend. The 30 or so vessels that reported ocean quahog landings during 2004 and 2005 was reduced and coast-wide harvests consolidated on to approximately 15 to 20 vessels in the subsequent years. However, the total number of vessels targeting ocean quahog has remained about the same in recent years, ranging from 15 to 22 vessels during the 2006-2019 period (Table 10).

The Maine ocean quahog fleet numbers started to decline when fuel prices soared in mid-2008, and with the decline in the availability of smaller clams consistent with the market demand (i.e., half-shell market), and totaled 6 vessels in 2019 (Table 10).

Initially, 154 vessel received ITQ allocation in 1990; however, in the last decade there have been fewer than 50 vessels participating in the fisheries each year. While it is not possible to accurately project future vessel consolidation patterns, it is possible that under additional vertical integration the number of vessels participating in the fisheries could decrease further. Vertically integrated companies could choose to retire older less efficient vessels (for larger, newer, more efficient ones). In addition, there could be further departure of the few independent harvesters still participating in the fisheries. In 2016-2019, a handful of independent vessels (less than 5) reported landings of surfclam and ocean quahog.

Table 10. Surfclam and ocean quahog active vessel composition, 2006-2019.

Vessel-type	Harvested Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Non-Maine Vessels	Both surfclam & quahog	9	9	8	8	12	12	13	7	7	6	8	14	8	7
	Only surfclam	20	24	24	28	22	24	29	33	31	31	30	26	31	36
	Only quahog	9	8	10	7	9	7	6	9	9	10	9	8	8	8
	Total	38	41	42	43	43	43	48	49	47	47	47	48	47	51
Maine Vessels	Only quahog	25	24	22	19	15	13	12	11	9	8	8	8	8	6

Dealers

In 2019, there were 7 companies (i.e., dealers) reporting purchases of surfclam and/or ocean quahog from the industrial fisheries that occur outside of Maine. These 7 companies operated 12 different facilities located in 5 states outside Maine. They were distributed by state as indicated in

[7] The reported number of vessels participating in the surfclam and/or ocean quahog fisheries in this document are derived from clam logbook data unless otherwise noted.

Table 11. For the most part, processors aim to meet supply schedules set by their customers which are large consumer good companies, such as Progresso or Campbell's, or large food service companies, such as Sysco. This requires that most clams be harvested and processed to meet set schedules. Employment data for these specific firms are not available. In 2019, these companies bought approximately $19 million worth of ocean quahog and $28 million worth of surfclam.

Table 11. Number of facilities that reported buying ocean quahog and surfclam by state (from NMFS dealer/processor report database) in 2019.

	MA	NJ	Other
Number of Facilities	4	5	3

6.4.5 Brief Description of Landings, Quota Utilization, and Market Trends

Surfclam and ocean quahog are processed into a variety of different products. The dominant use of surfclam has been in the "strip market" to produce fried clams. In recent years (Mid-2000s on), however, they have increasingly been used in chopped or ground form for other products, such as high-quality soups and chowders (MAFMC 2010). The dominant use of ocean quahog has been in products such as soups, chowders, and white sauces. Their small meat has a sharper taste and darker color than surfclam, which has not permitted their use in strip products or the higher-quality chowders products (MAFMC 2010).

For most years from 1990 (when the ITQ system was implemented) to 2003, the surfclam harvest levels were near or at full quota level. However, for the last decade or so (2008-2019), surfclam production has been below the quota. The quotas and landings levels and the percent of quota landed from 1998-2019 for surfclam and ocean quahog are shown in Table 2. Surfclam landings have not reached the quota of 3.4 million bushels since it was set in 2004. It should be noted that both changes in landings and the changes in quota levels affect the quota utilization shown in Table 2. Surfclam landings in 2019, reached a record low at 1.9 million bushels, the lowest landings level since the ITQ system was implemented which also corresponds to the lowest quota utilization (percentage of quota landed). Overall, in the last few years (2008-2019), a downward trend in landings of surfclam is observed (Table 2).

On the other hand, ocean quahog landings have consistently been below the quota for most years since 1990. Industry utilization of ocean quahog has varied across the years, influenced by market conditions and the costs of harvesting. There was a shift toward greater utilization of ocean quahog in 1997 and 1998. Both years saw almost all of the quota harvested, while surfclam quota was left unharvested. However, this trend reverted back to the historical norm in 1999 as fuel prices spiked, when it became more expensive to harvest ocean quahog that are found farther offshore. Higher fuel prices combined with increasing scarcity of dense ocean quahog beds resulted in an overall decline in ocean quahog harvests (MAFMC 2010). During 2001-2004, there was again a brief increase in ocean quahog landings, with 80 percent or more of the ocean quahog quota landed. In the last fifteen years or so (2003-2019), a downward trend in landings of ocean quahog is observed (Table 2). Ocean quahog landings in 2019, were 2.5 million bushels, which also corresponds to one of the lowest quota utilizations (percentage of quota landed) since the ITQ system was

implemented in 1990. Ocean quahog landings have not reached the quota of 5.3 million bushels since it was set in 2005.

The Maine ocean quahog fleet landed 100 percent of the quota (100,000 Maine bushels) in five years from 2003-2009. On average, 68 percent of the quota has been landed in the 2003-2019 period. However, in the last 5 years (2015-2019), only 34 percent of the quota has been landed. Maine ocean quahog landings were 23,339 Maine bushels in 2019.

According to industry members, the reduction in landings for surfclam and ocean quahog in the mid-2000s was due to several factors related to reduction in product marketing/advertisement (e.g., clam chowder), limited markets, and competition from imported clams that are available from a relatively large number of countries, including Canada, Thailand, Vietnam, China, and Chile (MAFMC 2009, MAFMC 2010, MAFMC 2013; Mitchell et al. 2011). Surfclam and ocean quahog landings have been mainly constrained by market limitations.

Industry members have consistently asked the Council to set the surfclam and ocean quahog quotas at levels lower than the overall ABC but to set the quotas for these two species at levels that are much larger than the market demand (landings) since the mid-2000s. In addition, the industry has consistently recommended to the Council to implement surfclam and ocean quahog quota levels that are consistent from year-to-year. According to industry members consistency in quota levels across time translates into price and supply stability in the fishery, and facilitates long-term business planning.

Industry members reported that the current COVID-19 pandemic has impacted surfclam and ocean quahog operations. Sales to restaurants (foodservice) was very low year-on-year (2020 vs 2019) for the months of March, April, May, and June; with the expectation that the effects of this may be ongoing and/or longer lasting. Seventy-five percent of all seafood is sold in restaurants in the U.S. Because of the pandemic both landings and sales have been reduced. All processors are continuing to operate to protect jobs within their organizations, which is causing inventories to rise dramatically because the supply is being built up without the sales. This causes storage costs to rise along with other expenses, which cannot continue in perpetuity without an increase in demand and sales. If this continues, it may result in reduced landings. When and if retail starts opening back up this will help relieve some of these added expenses (Surfclam and Ocean Quahog Advisory Panel 2020).

7.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This EA analyzes the impacts of the alternatives described fully under section 5.0 which specify commercial quotas for the 2021-2026 surfclam and ocean quahog fisheries, that are necessary to ensure overfishing does not occur and ACLs are not exceeded (Table 12). In addition, the Council requested that the NMFS Regional Administrator suspend the minimum shell length for surfclam in 2021-2026. The Council did not recommend changes to other regulations in place for these fisheries; therefore, any other management measures in place will remain unchanged (*status quo*) for 2021-2026 fishing years (see section 5.5 for additional discussion).

Environmental impacts are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). Table 13 summarizes the guidelines used for each VEC to determine the magnitude and direction of the impacts described in this section.

The recent conditions of the VECs include the biological conditions of the target stocks, non-target stocks, and protected species over the most recent five years (sections 6.1 and 6.3). They also include the fishing practices and levels of effort and landings in the surfclam and ocean quahog fisheries over the most recent years, as well as the economic characteristics of the fisheries over the most recent years (depending on the dataset; section 6.4). The recent conditions of the VECs also include recent levels of habitat availability and quality (section 6.2). The current condition of each VEC is described in Table 14.

This EA analyzes the impacts of the alternatives described fully under section 5.0. For ease of reference, those alternatives are listed here.

Table 12. Summary of the commercial quotas (in mt and bushels), for each of the quota-based alternatives.

Species Quotas	Same for Each Year 2021-2026		
	Alt. 1 (Pref.)	**Alt. 2**	**Alt. 3**
Surfclam (mt)	26,218	20,218	14,265
Surfclam (mil bu)	3.40	2.63	1.85
Ocean quahog non-Maine (mt)	24,190	22,194	17,781
Ocean quahog non-Maine (mil bu)	5.36	4.86	3.92
Ocean quahog Maine (mt)	499	486	363
Ocean quahog Maine (bu)	100,000	97,404	72,753

The alternatives are not compared to a theoretical condition where the fisheries are not operating. These fisheries have occurred for many decades and are expected to continue into the foreseeable future. The nature and extent of the management programs for these fisheries have been examined in detail in EAs and Environmental Impact Statements (EISs) prepared for previously implemented management actions under the Atlantic Surfclam and Ocean Quahog FMP.

When considering overall impacts on each VEC, both surfclam and ocean quahog commercial fisheries are considered. This action proposes modifications to the annual quotas and minimum size for surfclam.

In general, alternatives which may result in overfishing or an overfished status for target and non-target species may have negative impacts for those species, compared to the current condition of the VEC. Conversely, alternatives which may result in a decrease in fishing effort, resulting in ending overfishing or rebuilding to the biomass target, may result in positive impacts for those species by resulting in a decrease in fishing mortality (Table 13).

For the physical environment and habitat, alternatives that improve the quality or quantity of habitat or result in a decrease in fishing effort are expected to have positive impacts. Alternatives that degrade the quality or quantity, or increase disturbance of habitat are expected to have negative impacts (Table 13). In addition, alternatives that result in continued fishing effort may result in slight negative impacts. A reduction in fishing effort is likely to decrease the time that fishing gear is in the water, thus reducing the potential for interactions between fishing gear and habitat. The commercial fisheries for surfclam and ocean quahog are prosecuted with clam dredges, a type of bottom tending mobile gear. The effects of clam dredges are short-term and minimal because the fisheries occur in a relatively small area (compared to the area impacted by scallop dredges or bottom trawls) and primarily in high energy sand habitats (section 6.2.3). While continued fishing effort has had a negative impact, for this fishery, those impacts are generally slight in magnitude as most of the fishing occurs in areas that are routinely fished, have a small footprint, and in areas that are already high energy.

For protected species, consideration is given to both ESA-listed species and MMPA protected species. ESA-listed species include populations of fish, marine mammals, or turtles at risk of extinction (endangered) or endangerment (threatened). For ESA-listed species, any action that results in interactions or take is expected to have negative impacts, including actions that reduce interactions. Actions expected to result in positive impacts on ESA-listed species include only those that contain specific measures to ensure no interactions (i.e., no take). By definition, all species listed under the ESA are in poor condition and any take has the potential to negatively impact that species' recovery.

Under the MMPA, the stock condition of each protected species varies, but all are in need of protection. For marine mammal stocks/species that have their potential biological removal (PBR) level reached or exceeded, negative impacts would be expected from any alternative that has the potential to interact with these species or stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), actions not expected to change fishing behavior or effort such that interaction risks increase relative to what has been in the fishery previously, may have positive impacts by maintaining takes below the PBR level and approaching the Zero Mortality

Rate Goal (Table 13). The impacts of each alternative on the protected resources VEC take into account impacts on ESA-listed species, impacts on marine mammal stocks in good condition (i.e., PBR level has not been exceeded), and marine mammal stocks that have exceeded or are in danger of exceeding their PBR level.

Socioeconomic (human communities) impacts are considered in relation to potential changes in landings and prices, and by extension, revenues, compared to the current fisheries conditions. Alternatives which could result in an increase in landings are generally considered to have positive socioeconomic impacts because they could result in increased revenues; however, if an increase in landings leads to a decrease in price or a decrease in SSB for any of the landed species, then negative socioeconomic impacts could occur.

Expected Changes in Fishing Effort Under Alternatives Considered

The expected impacts to each VEC are derived from both consideration of the current condition of the VEC and the expected changes in fishing effort under each of the alternatives. It is not possible to quantify with confidence how effort will change under each alternative; therefore, expected changes are typically described qualitatively.

Table 13. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline) summarized in Table 14 below.

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

Table 14. Baseline conditions of VECs considered in this action, as summarized in section 6.0.

VEC		Baseline Condition	
		Status/Trends, Overfishing?	**Status/Trends, Overfished?**
Target stocks (section 6.1.1 and 6.1.2)	**Atlantic surfclam**	No	No
	Ocean quahog	No	No
Non-target species (principal species listed in section 6.1.3 that account for 0.1 percent or more of the total catch from surfclam or quahog trips)	**Moon snail**	Unassessed	Unassessed
	Sea scallop	No	No
	Little skate	No	No
	Winter skate	No	No
Habitat (section 6.2)		Commercial fishing impacts are complex and variable and typically adverse; Non-fishing activities had historically negative but site-specific effects on habitat quality.	
Protected resources (section 6.3)	**Sea turtles**	Leatherback and Kemp's ridley sea turtles are classified as endangered under the ESA; loggerhead (NW Atlantic Ocean DPS) and green (North Atlantic DPS) sea turtles are classified as threatened.	
	Fish	Atlantic salmon, shortnose sturgeon, and the New York Bight, Chesapeake, Carolina, and South Atlantic DPSs of Atlantic sturgeon are classified as endangered under the ESA; the Atlantic sturgeon Gulf of Maine DPS is listed as threatened; cusk are candidate species	
	Large whales	All large whales in the Northwest Atlantic are protected under the MMPA. North Atlantic right, fin, blue, sei, and sperm whales are also listed as endangered under the ESA.	
	Small cetaceans	Pilot whales, dolphins, and harbor porpoise are all protected under the MMPA.	
	Pinnipeds	Gray, harbor, hooded, and harp seals are protected under the MMPA.	
Human communities (section 6.4)		Surfclam and ocean quahog stocks support substantial industrial fisheries and related support services. 2019 estimated ex-vessel revenues were $28 and $19 million for surfclam and ocean quahog, respectively. Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City and Point Pleasant, New Jersey, and New Bedford, Massachusetts. There are also landings in Ocean City, Maryland, and the Jonesport and Beals Island areas of Maine. The small scale Maine quahog fishery (6 vessels) is entirely for ocean quahog, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclam and ocean quahog, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products. In 2019, there were 64 surfclam and 33 ocean quahog allocations owners at the beginning of the fishing year. A total of 51 vessels were active in the ITQ fisheries in 2019, including a handful of independent vessels (less than 5).	

7.1 Impacts from Alternatives for 2021-2026

The impact analysis that follows in 7.1 and 7.2 focuses on 2021 for simplicity of discussion. However, the same impacts would be expected to apply to 2022-2026 as the alternatives proposed for each of these years 2021-2026 are identical. There is no indication that the market environment for commercially caught surfclam and ocean quahog will change considerably in future years 2022-2026 and therefore expected impacts will be similar to those described for 2021.

Current landings levels have been substantially lower than the quota levels for both surfclam and ocean quahog and these conditions are not expected to change (section 6.4.5); therefore, no changes are expected when compared to current conditions. Since fishing year 2019 is the last full year of data available (complete year data from 2020 is not available), it was chosen as the base year for the analysis. As such, 2019 landings data were used as a proxy for 2020. Also note that in 2019 and 2020, the same quota levels were implemented for both species. As indicated in section 6.4.5 (Brief Description of Landings, Quota Utilization, and Market Trends) and Table 2, in the last ten to fifteen years there is a downward trend in landings of surfclam and/or ocean quahog. Nevertheless, it is possible that if market conditions improve in 2021, landings of surfclam and/or ocean quahog could be higher than those realized in 2019. However, this is unlikely.

7.1.1 Impacts on Atlantic Surfclam and Ocean Quahog and Non-Target Species

7.1.1.1 Alternative 1 (Preferred *Status Quo*/Least Restrictive)

Overall, alternative 1 would provide similar fishing opportunities in 2021 (*status quo* quotas) for both surfclam and ocean quahog when compared to 2020. It is expected that 2021 landings may remain similar to 2019 for both species.

The measures contained under the *status quo* alternative are consistent with the ABC recommendations of the SSC and, therefore, based on the best scientific information available intended to prevent overfishing. The surfclam and ocean quahog SSB_{MSY} are both projected to remain above SSB_{MSY} for 2021-2026. Continuing to prevent overfishing, as was done in 2020, is expected to result in slight positive impacts on these managed resources overall by ensuring future sustainability of the stocks and maintaining the current conditions of these stocks. For non-target species caught incidentally in these fisheries, their catch rates would also not change as a result of this alternative; therefore, the current condition of these non-target species would not be expected to change (as described in section 6.1.3). As none of these species are overfished or undergoing overfishing, impacts for non-target species would also be slight positive when compared to the current conditions.

7.1.1.2 Alternative 2 (Non-Preferred: Mid-Point)

Alternative 2 would provide lower fishing opportunities (e.g., lower quota levels) in 2021 for both surfclam and ocean quahog when compared to the *status quo* measures (alternative 1) but higher than those under alternative 3. However, it is expected that 2021 landings will remain similar to 2019 for both species. The measures contained under the alternative 2 are also consistent with the ABC recommendations of the SSC and, therefore, based on the best scientific information

available intended to prevent overfishing. The surfclam and ocean quahog SSB_{MSY} are both projected to remain above SSB_{MSY} for 2021-2026. Continuing to prevent overfishing, as was done in 2020, is expected to result in slight positive impacts on these managed resources overall by ensuring future sustainability of the stocks and maintaining the current conditions of these stocks. For non-target species caught incidentally in these fisheries, their catch rates would also not change as a result of this alternative; therefore, the current condition of these non-target species would not be expected to change (as described in section 6.1.3). As none of these species are overfished or undergoing overfishing, impacts for non-target species would also be slight positive when compared to the current conditions.

7.1.1.3 Alternative 3 (Non-Preferred: Most Restrictive)

Alternative 3 would provide lower fishing opportunities (e.g., lower quota levels) in 2021 for both surfclam and ocean quahog when compared to the *status quo* measures (alternative 1) and alternative 2. However, it is expected that 2021 landings will remain similar to 2019 for both species. The measures contained under the alternative 3 are also consistent with the ABC recommendations of the SSC and, therefore, based on the best scientific information available intended to prevent overfishing. The surfclam and ocean quahog SSB_{MSY} are both projected to remain above SSB_{MSY} for 2021-2026. Continuing to prevent overfishing, as was done in 2020, is expected to result in slight positive impacts on these managed resources overall by ensuring future sustainability of the stocks and maintaining the current conditions of these stocks. For non-target species caught incidentally in these fisheries, their catch rates would also not change as a result of this alternative; therefore, the current condition of these non-target species would not be expected to change (as described in section 6.1.3). As none of these species are overfished or undergoing overfishing, impacts for non-target species would also be slight positive when compared to the current conditions.

7.1.1.4 Comparison of Alternatives for Target and Non-Target Species

All three alternatives would be expected to result in slight positive impacts on these managed resources overall by ensuring future sustainability of the stocks and maintaining the current conditions of these stocks.

Thus, when comparing across all three alternatives for 2021 for the target species (surfclam and ocean quahog), alternatives 2 (mid-point) and 3 (most restrictive) are expected to have no impacts when compared to *status quo* measures (alternative 1). When comparing all three alternatives for 2021 for non-target species, alternative 3 (most restrictive) is expected to result in a slight positive change in impacts compared to the *status quo* measures (alternative 1) and alternative 2. This would be the result of a slightly more constrained surfclam quota (4.6 percent less that the 2019 realized landings) because it would potentially result in fewer encounters with non-target species.

7.1.2 Impacts on the Physical Habitat

7.1.2.1 Alternative 1 (Preferred *Status Quo*/Least Restrictive)

Overall, alternative 1 would provide similar fishing opportunities in 2021 (*status quo* quotas) for both surfclam and ocean quahog when compared to 2020. It is expected that 2021 landings will remain similar to 2019 for both species and the amount of resulting fishing effort and time the clam dredges spend contacting the bottom and interacting with physical habitat would also not be expected to change. That ongoing fishing activity and disturbance to habitat would be expected to continue to have slight negative impacts. Therefore, slight negative impacts are expected on physical habitat (as described in section 6.2), when compared to the current conditions.

7.1.2.2 Alternative 2 (Non-Preferred: Mid-Point)

Alternative 2 would provide lower fishing opportunities (e.g., lower quota levels) in 2021 for both surfclam and ocean quahog when compared to the *status quo* measures (alternative 1) but higher than those under alternative 3. While this alternative specifies lower quota levels than alternative 1, it is expected that 2021 landings will remain similar to 2019 for both species and the amount of resulting fishing effort and time the clam dredges spend contacting the bottom and interacting with physical habitat would also not be expected to change. That ongoing fishing activity and disturbance to habitat would be expected to continue to have slight negative impacts. Therefore, slight negative impacts are expected on physical habitat (as described in section 6.2), when compared to the current conditions.

7.1.2.3 Alternative 3 (Non-Preferred: Most Restrictive)

Alternative 3 would provide lower fishing opportunities (e.g., lower quota levels) in 2021 for both surfclam and ocean quahog when compared to the *status quo* measures (alternative 1) and alternative 2. While this alternative specifies lower quota levels than alternatives 1 and 2, it is expected that 2021 landings will remain similar to 2019 for both species and the amount of resulting fishing effort and time the clam dredges spend contacting the bottom and interacting with physical habitat would also not be expected to change. That ongoing fishing activity and disturbance to habitat would be expected to continue to have slight negative impacts. Therefore, slight negative impacts are expected on physical habitat (as described in section 6.2), when compared to the current conditions.

7.1.2.4 Comparison of Alternatives for Physical Habitat

All three alternatives would be expected to result in slight negative impacts on physical habitat by maintaining the current conditions (i.e., current levels of impacts to habitat), although perhaps slightly less so under alternative 3.

When comparing all three alternatives for 2021 for habitat, alternative 3 (most restrictive) is expected to result in a slight positive change in impacts compared to the *status quo* measures (alternative 1) and alternative 2. This would be the result of a slightly more constrained surfclam quota (4.6 percent less that the 2019 realized landings) because it would potentially result in fewer trips.

7.1.3 Impacts on Protected Resources

7.1.3.1 Impacts of Alternative 1 (Preferred *Status Quo*/Least Restrictive), Alternative 2 (Non-Preferred: Mid-Point), and Alternative 3 (Non-Preferred: Most Restrictive)

The surfclam and ocean quahog fisheries are prosecuted with hydraulic clam dredges. As noted in section 6.3, the gear type used to prosecute the surfclam and ocean quahog fisheries is not expected to pose an interaction risk to any protected species. Since 1989, the date of NMFS' earliest observer records for federally managed fisheries, there has been no observed or documented interactions between gear used in the surfclam and ocean quahog fisheries and any ESA-listed or MMPA protected species as a result no take is anticipated or exempted for these fisheries (section 6.3). Stock health varies species by species (for those protected under ESA and/or MMPA) and while some species are doing well, others remain negatively impacted by the prosecution of fisheries for many other species in the Northeast. Given this, the commercial fisheries for surfclam and ocean quahog would not be expected to result in changes (i.e., no impacts) to the current conditions of these protected resources overall, which are slight negative.

7.1.3.2 Comparison of Alternatives for Protected Resources

Under all three alternatives, the current conditions of protected resources are unlikely to change (as described in section 6.3). Therefore, none of these alternatives (1-3) would be expected to result in changes to the current conditions of these protected resources overall, which are slight negative.

When comparing across all three alternatives for 2021 for protected resources, alternatives 2 and 3 are expected to have no impacts on protected species when compared to the *status quo* measures (alternative 1), because there have been no documented interactions between the gear used to prosecute these fisheries and protected resources.

7.1.4 Impacts on Human Communities (Socioeconomic Impacts)

In the sections below examining the impacts on human communities, the effects of actions were analyzed by employing quantitative approaches to the extent possible. Where quantitative data were not available, qualitative analyses were conducted. In the current analysis, effects associated with the proposed management measures should be evaluated by looking at the impact the proposed measures are expected to have on revenues.

Total clam revenues, landings, and prices per bushel were estimated for calendar year 2019. Since fishing year 2019 is the last full year of data available (complete year data from 2020 is not available), it was chosen as a proxy current condition (the last year for which complete data is available). As such, 2019 data were used as a proxy for 2020. These estimates provide the basis for which subsequent quota and landings changes and their associated effect on revenues were compared. Expected change in revenues are deducted or added, as appropriate, depending upon which quota scenario is evaluated.

7.1.4.1 Alternative 1 (Preferred *Status Quo*/Least Restrictive)

Alternative 1 would provide similar fishing opportunities in 2021 (*status quo* quotas) when compared to 2020. Adoption of these quotas would have no impacts on the fisheries (ex-vessel gross revenues) if landings and prices are similar to those that occurred in 2019. The quota utilization for surfclam has ranged from 85 percent in 2008 to 57 percent in 2019. Surfclam landings in 2019, reached a record low at 1.9 million bushels, the lowest landings level since the ITQ system was implemented which also corresponds to the lowest quota utilization (percentage of quota landed). Overall, in the last few years (2008-2019), a downward trend in landings of surfclam is observed. The ocean quahog quota utilization has ranged from 78 percent in 2004 to 46 percent in 2019. Ocean quahog landings in 2019 were estimated at 2.5 million bushels, which also corresponds to one of the lowest quota utilizations (percentage of quota landed) since the ITQ system was implemented in 1990. In the last 5 years (2015-2019), only 34 percent of the Maine ocean quahog quota (100,000 Maine bushels/year) has been landed. Maine ocean quahog landings were 23,339 bushels in 2019.

Unless market conditions change substantially in 2021, it would be expected that commercial landings will likely be close to the 2019 landings. There is no indication that the market environment for commercially caught surfclam and ocean quahog will change considerably in years 2021-2026. The proposed surfclam, non-Maine ocean quahog, and Maine ocean quahog quotas under alternative 1 are 43 percent, 54 percent, and 327 percent higher than the realized 2019 landings, respectively. The proposed quotas under this alternative are not expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. As such, no changes in ex-vessel revenues are expected when compared to current conditions (see section 7.1.4.4 below).

Although fisheries management has had some slight negative impacts on these fishing communities, these fisheries have been managed sustainably for many years and this has allowed for stability in these fisheries, their markets, and fishing industry in both the short and longer-term. Overall, alternative 1 will continue to maintain those slight positive impacts on the human communities associated with these fisheries when compared to the current conditions.

7.1.4.2 Alternative 2 (Non-Preferred: Mid-Point)

Alternative 2 would provide lower fishing opportunities (e.g., lower quota levels) in 2021 when compared to the *status quo* measures (alternative 1) but higher than those under alternative 3. While this alternative specifies lower quota levels, it is expected that the impacts from its implementation would be similar to those under alternative 1, given the current market conditions in the surfclam and ocean quahog fisheries. There is no indication that the market environment for commercially caught surfclam and ocean quahog will change considerably in years 2021-2026. The proposed surfclam, non-Maine ocean quahog, and Maine ocean quahog quotas under alternative 1 are 26 percent, 50 percent, and 327 percent higher than the realized 2019 landings, respectively.

The proposed quotas under this alternative are not expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing

methods and practices. As such, no changes in ex-vessel revenues under this alternative would be expected and this alternative will continue to maintain those slight positive impacts on the human communities associated with these fisheries when compared to the current conditions.

7.1.4.3 Alternative 3 (Non-Preferred: Most Restrictive)

Alternative 3 would provide lower fishing opportunities (e.g., lower quota levels) in 2021 when compared to the *status quo* measures (alternative 1) and alternative 2. The proposed non-Maine ocean quahog and Maine ocean quahog quotas under alternative 3 are 38 percent and 327 percent higher than the realized 2019 landings, respectively. However, the surfclam quota under alternative 3 (1.85 million bushels) is 4.6 percent lower than the realized 2019 surfclam landings (1.94 million bushels). Assuming 2019 ex-vessel value ($14.27/bu) this alternative would result in a reduction in surfclam ex-vessel revenues of $1.3 million (90,000 bu x $14.27/bu); however, if there is an increase in the price/bu as a result of the reduced landings, then the revenue reduction would be less than stated. Overall, the proposed quotas under this alternative are not expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. As such, no changes in ex-vessel revenues and this alternative would be expected and this alternative will continue to maintain those slight positive impacts on the human communities associated with these fisheries when compared to the current conditions.

7.1.4.4 Comparison of Alternatives for Human Communities

Although fisheries management has had some slight negative impacts on these fishing communities, these fisheries have been managed sustainably for many years and this has allowed for stability in these fisheries, their markets, and fishing industry in both the short and longer-term. All of these alternatives (1-3) would continue to maintain those slight positive impacts on the human communities associated with these fisheries when compared to the current conditions.

When comparing across all three alternatives for 2021 for human communities, alternative 3 (most restrictive) will result in the greatest potential for overall negative social and economic impacts (slight negative) because it would provide lower fishing opportunities in 2021 due to the slightly lower quotas when compared to the *status quo* measures (alternative 1) and alternative 2. In addition, alternative 3 could potentially disrupt longer-term business arrangements between the fishing industry and financial institutions; however, the impacts from these reduced quota levels would likely be small and could be offset by changes in price. Industry members have previously indicated that drastic quota reductions would disrupt the manner in which industry and the banking sector operate and obtain loans and lines of credits that are utilized by industry members to finance capital investment and business operations would be increasingly more difficult.

7.2 Minimum Shell Length Alternatives

7.2.1 Impacts on Atlantic Surfclam and Ocean Quahog and Non-Target Species

The minimum length for surfclam of 4.75 inches (12.065 cm) would be suspended annually (2021-2026) under preferred alternative 1 by the Regional Administrator, following an analysis of the

size composition of the landings. The report titled, "Estimated Proportion of Undersized Surfclam Landings for 2019" (Sullivan 2019), indicates that an estimated 22.0% of the coast wide surfclam landings to date in 2019 were undersized.

These measures are *status quo* and would not be expected to alter the manner in which the fishery is currently prosecuted or the way gear is fished and clam cages are filled. Therefore, this alternative does not affect the condition of the surfclam stock or any non-target species (biological impacts). Alternative 1 is not expected to alter the current slight positive conditions of the managed resource (surfclam) or non-target species.

The minimum length for surfclam of 4.75 inches (12.065 cm) would be implemented on January 1, 2021 (2022-2026) under preferred alternative 1. Since implementation of the ITQ program, industry has indicated that processors pay a price differential for various size/quality clams. Reinstating a minimum size (as described under alternative 2) would require sorting the catch to retain legal size clams. Fishing industry members have suggested that the culling out and discarding of small clams on board the vessel, after cages are filled, could result in fracture of the clam shell during this process. In addition, there is the potential that clams will be discarded into different habitat, or less than optimal habitat than they were removed from. However, these clams would be dead regardless of whether they are retained as landings under alternative 1. Reinstating the minimum length would simply require this additional step to sort clams by size. These shell length alternatives merely affect the efficiency of operations once clam catch is on board the fishing vessel. Therefore, these alternatives do not affect the current, slight positive condition of the surfclam stock or any non-target species.

7.2.2 Impacts on the Physical Habitat

The minimum length for surfclam of 4.75 inches (12.065 cm) would be suspended annually (2021-2026) under preferred alternative 1 by the Regional Administrator, following a review of relevant data. These measures are *status quo* and would not alter the manner in which the fishery is currently prosecuted or impact the amount of fishing effort or time the fishing gear contacts the bottom habitat. Therefore, alternative 1 is not expected to alter the current, slight negative condition of physical habitat.

The minimum length for surfclam of 4.75 inches (12.065 cm) would be implemented on January 1, 2021 (2022-2026) under preferred alternative 1. Reinstating a minimum size (as described under alternative 2) would require sorting the catch to retain legal size clams. These measures are not expected to alter the manner in which the fishery is currently prosecuted, or alter the manner in which the clam dredge is used to fish for surfclam. Reinstating the minimum length would simply require this additional step to sort clams by size; therefore, these shell length alternatives merely affect the efficiency of operations once clam catch is on board the fishing vessel. The sorting of clams on board the vessel would not be expected to impact the amount of fishing effort or time the fishing gear contacts the bottom habitat. Therefore, these alternatives do not affect the current, slight negative condition of the physical habitat.

7.2.3 Impacts on Protected Resources

The minimum length for surfclam of 4.75 inches (12.065 cm) would be suspended annually (2021-2026) under preferred alternative 1 by the Regional Administrator, following a review of relevant data. These measures are *status quo* and would not alter the manner in which the fishery is currently prosecuted or the way this fishing gear interacts with protected resources. Reinstating the minimum length (as described under alternative 2) would simply require an additional step to sort clams by size; these shell length alternatives merely affect the efficiency of operations once clam catch is on board the fishing vessel. There have been no documented interactions with protected resources and clam dredges used in these fisheries. Therefore, neither alternatives 1 nor 2 are expected to impact protected resources (i.e., no impacts), whose current condition is slight negative.

7.2.4 Impacts on Human Communities (Socioeconomic Impacts)

Maintenance of the *status quo* alternative would not alter the current, slight positive condition of the socioeconomic aspects of the surfclam fishery during the next six years because no additional costs for industry are associated with maintaining current fishing procedures.

Alternative 2 is a non-preferred (no action) alternative. Under this alternative the minimum shell length (i.e., size limit) of 4.75 inches (12.065 cm) is not suspended; therefore, the shell length requirement will be in place for this fishery in 2021-2026. Reinstating a minimum size would require sorting the catch to retain legal size clams. It is expected that adopting this alternative would result in substantial costs to small business entities, without producing a significant compensating benefit to the surfclam resource. Discarding 22 percent of the landings would increase the cost of harvesting and result in longer fishing days and more time at-sea for fishermen.

7.2.5 Comparison of the Shell Length Alternatives

Under both alternatives, the current conditions of the target and non-target species would be unaffected and be expected to be slight positive. Ongoing fishing operations would continue to result in slight negative impacts to physical habitat. Protected resources do not appear to be impacted by the surfclam and ocean quahog fisheries (i.e., no impacts as there are no documented interaction with these species; section 6.3), therefore the current conditions of protected resources would be unaffected and continue to be slight negative. When compared to the current socioeconomic conditions, alternative 1 would not change the current conditions (which are slight positive) and alternative 2 would also continue to maintain slight positive impacts.

When comparing across the two alternatives for 2021 for shell length, alternative 2 (No Action on Minimum Shell Length) will result in negative socioeconomic impacts when compared to the *status quo* measures (alternative 1) as it would result in substantial costs to small business entities. For the target species (surfclam) non-target species, physical habitat, and protected resources, the difference between these two alternatives is considered negligible and alternative 2 would result in no impact compared to the *status quo* measures (alternative 1).

7.3 Cumulative Effects Analysis

7.3.1 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 surfclam and ocean quahog fisheries.

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.

7.3.1.1 Consideration of the Valued Ecosystem Components (VECs)

The VECs for the surfclam and ocean quahog fisheries are generally the "place" where the impacts of management actions occur and are identified in section 6.0 (Description of the Affected Environment).

- Target species (i.e., surfclam and ocean quahog) and non-target species
- Physical habitat (including EFH)
- 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.

7.3.2.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of surfclam and ocean quahog. The Western Atlantic Ocean is the core geographic scope for each of the VECs. The core geographic scopes for the managed species are the management units for surfclam and ocean quahog (section 6.1). For non-target species, those ranges 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 surfclam and ocean quahog 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 through Virginia directly involved in the harvest or processing of surfclam and ocean quahog (section 6.4).

7.3.3.3 Temporal Boundaries

Overall, while the effects of the historical surfclam and ocean quahog fisheries are important and considered in the analysis, the temporal scope of past and present actions for surfclam and ocean quahog and non-target species and other fisheries, the physical environment and EFH, and human communities is primarily focused on actions that occurred after FMP implementation (1977 for surfclam and ocean quahog). 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 six years (2026) into the future, which is the duration of the specifications proposed in this document. 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 this section are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

7.3.2 Relevant Actions Other Than Those Proposed in this Document

Past, present, and reasonably foreseeable future actions for surfclam and ocean quahog 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.

7.3.2.1 Fishery Management Actions

7.3.2.1.1 Surfclam and Ocean Quahog FMP Actions

Past, present, and reasonably foreseeable future actions for surfclam and ocean quahog management includes the establishment of the original FMPs, all subsequent amendments and frameworks, and the setting of annual specifications (annual catch limits and other measures to constrain catch and harvest). In 1998, Amendment 8 replaced the regulated fishing time system in the surfclam and ocean quahog fisheries with an ITQ system. Amendment 16 (MAFMC 2011) established ACLs and AMs consistent with the 2007 revisions to the Magnuson-Stevens Act. Related to this requirement, the Council annually implements or reviews catch and landings limits for each species consistent with the recommendations of the SSC, and reviews other management measures as necessary to prevent catch limits from being exceeded and to meet the objectives of the FMP. In 2016, NMFS implemented a data collection protocol process to collect information about quota share ownership and other forms of control of allocations that would enhance the management of these fisheries. In addition, in 2016, Amendment 17 established a cost recovery program for the surfclam and ocean quahog ITQ fishery, as required by the Magnuson-Stevens Act; and the amendment also contained provisions to remove the optimum yield ranges and changed how biological reference points are incorporated into the FMP.

The Council recently took final action on the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment (Amendment 20), that proposes to implement excessive shares cap level to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges, and to modify the FMP goals and objectives for surfclam and ocean quahog. The Council also adopted multi-year management measures and periodic review of the excessive shares measures. This action is pending approval and implementation by NMFS, with implementation expected in 2021. The actions proposed in the excessive shares amendment are administrative in nature and are not expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. The action is expected to have no impact (direct or indirect) on the target species, non-target species, habitat, and protected resources. Lastly, this action is expected to have socioeconomic impacts ranging from no impact in the short-term to positive impact in the long-term compared to current conditions, as it provides protection against excessive consolidation and associated market power and social issues.

In 2020, the Council has begun to explore an issue raised by the surfclam and ocean quahog fishing industry related to current species separation requirements of surfclam and ocean quahog on fishing trips. Specifically, as surfclam have shifted toward deeper waters in recent years, catches including both surfclam and ocean quahog have become more common. However, regulations do not allow for trips and cages to be mixed with both species (comingling). The Council is forming a Fishery Management Action Team to develop options/solutions that may be implemented through data collection or regulatory changes or a Council Amendment.

The MSA is the statutory basis for federal fisheries management. The cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the VECs 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. Generally, FMP actions have had slight negative impacts on habitat, due to continued fishing operations which impact physical habitat; 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 some slight indirect positive impacts on protected species, including ESA-listed species. The FMP required standardized bycatch reporting (SBRM) obtained through fishing vessel observer coverage allows for the collection of better information on bycatch in these fisheries. In addition, the introduction of the ITQ Program in 1990 resulted in fleet consolidation and fewer vessels fishing and produces underwater sounds, which have been shown to introduce risks to protected species, such as whales and other marine mammals.

7.3.2.1.2 Other Fishery Management Actions

In addition to the Atlantic Surfclam and Ocean Quahog FMP, there are many other FMPs and associated fishery management actions for other species that have impacted these VECs over the temporal scale described in section 7.3.3.3. 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.

For example, the NEFMC's omnibus habitat amendments revised EFH and habitat area of particular concern designations for NEFMC-managed species, revised or created habitat management areas, including gear restrictions to protect vulnerable habitat from fishing gear impacts, and established habitat research areas. These actions are expected to have overall positive impacts on habitat and EFH, with expected long-term positive implications for target and non-target species, while having mixed socioeconomic impacts on various user groups.

The MAFMC's omnibus forage amendment, implemented in 2017, established a commercial possession limit for over 50 forage species which were previously unmanaged in federal waters. This action is thought to have ongoing positive impacts to target, non-target, and protected species by protecting a forage base for these populations and limiting the expansion of any existing fishing effort on forage stocks.

The convening of take reduction teams for marine mammals over the temporal scope described in section 7.3.3 has had positive impacts for marine mammals via recommendations for management measures to reduce mortality and injury to marine mammals. These actions have had indirect positive impacts on target species, non-target species, and habitat as they have improved monitoring of fishing effort and reduced the amount of gear in the water. These measures have had indirect negative impacts on human communities through reduced fishery efficiency.

In the reasonably foreseeable future, the MAFMC and NEFMC are considering modifications to observer coverage requirements through an omnibus amendment that considers measures that would allow the Councils to implement industry-funded monitoring coverage in some FMPs above levels required by the Standard Bycatch Reporting Methodology in order to assess the amount and type of catch, monitor annual catch limits, and/or provide other information for management. This action could have long-term positive impacts on target species, non-target species, and protected species through improved monitoring and scientific data on these stocks. This could potentially result in negative socioeconomic impacts to commercial fishing vessels due to increased costs.

As with the Atlantic Surfclam and Ocean Quahog FMP actions described above, other FMP actions have had positive long-term cumulative impacts on managed and non-target species because they constrain fishing effort and manage stocks at sustainable levels. As previously stated, constraining fishing effort can have negative short-term socioeconomic impacts and long-term positive impacts. These actions have typically had slight negative impacts on habitat, due to continued fishing operations; however, some actions had long-term positive impacts 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 slight negative to slight positive impacts on non ESA-listed marine mammals, depending on the species.

7.3.2.1.3 Fishery Management Action Summary

The Council has taken many actions to manage its 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.

7.3.2.2 Non-Fishing Impacts

7.3.2.2.1 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 species that reside in those areas. The impacts of most nearshore human-induced non-fishing activities tend to be localized in the nearshore areas and marine project 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 assume these activities will likely continue as projects are proposed.

Examples of these 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 windfarms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these non-fishing activities primarily stem from habitat loss due to human interaction and alternation 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 larger in scale, 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 impacts, depending on the species and activity.

Non-fishing activities permitted under 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 measure serves 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 process 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 authority. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2)[8], which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

In recent years, offshore wind energy and oil and gas exploration have become more relevant 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,

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

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 and 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.[9] Temporary, acute, noise impacts from construction activity could impact reproductive behavior and migration patterns; the long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015, Finneran 2016, Nowacek et al. 2007, NRC 2000, NRC 2003, NRC 2005, Madsen et al. 2006, 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. 2010, Bailey et al. 2014, 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, NRC 2005, Richardson et al. 1995, Romano et al. 2004, Slabbekoorn et al. 2010, Thomsen et al. 2006, Wright et al. 2007). Indirect effects are likely to result from changes to the acoustic environment of the species, which may affect the completion of essential life functions (e.g., migrating, breeding, communicating, resting, foraging)[10] (Forney et al. 2017, Richardson et al. 1995, Slabbekoorn et al. 2010, Thomsen et al. 2006).

Wind farm survey and construction activities and turbine/cable placement will substantially affect NMFS scientific research surveys, including stock assessment surveys for fisheries and protected species[11] and ecological monitoring surveys. Disruption of such scientific surveys could increase scientific uncertainty in survey results and may significantly affect NMFS' ability to monitor the health, status, and behavior of marine resources and protected species and their habitat use within this region. Based on existing regional Fishery Management Councils' acceptable biological catch control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and recreational harvest limits that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower associated fishing revenue and reduced recreational fishing opportunities, which could result in indirect negative impacts on fishing communities.

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

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

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

Impacts of Offshore Wind Energy Development on Socioeconomic Resources

One offshore wind pilot project off Virginia installed two turbines in 2020**.** Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Massachusetts to North Carolina (see leasing map below – Figure 10). According to BOEM, approximately 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 2020a). BOEM has recently begun a planning process for the Gulf of Maine via a regional intergovernmental renewable energy task force (https://www.boem.gov/Gulf-of-Maine). It is not clear at this time where development might occur in the Gulf of Maine. Given the water depth in the region, floating turbines will likely be the primary type of wind turbine foundations to be deployed in the area. As the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities.

Offshore wind energy development is being considered in parts of the outer continental shelf that overlap with the surfclam and ocean quahog fisheries, specifically in sandy areas off of New Jersey and New York, although some areas in Southern New England may also overlap. The distribution of the fishery as catch and LPUE by ten-minute square over time is shown in Figures 11 and 12 (section 6.2). The fishery has been active in these areas, and is expected to be in the near future as catch rates in more southern areas have declined.

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 surfclam and ocean quahog fishing grounds. Impacts may vary by year based on the extent to which the vessels would be able to fish within these areas. Figures 11 and 12 show the surfclam and ocean quahog and clam dredge gear revenues (2012-2016). It is worth noting that this analysis represents only a rough approximation of potential effects from the areas because some of the areas presently fished would be expected to support fishing in the future in the absence of offshore wind energy development, any restriction of fishing access to this region as a result of offshore wind energy development would be perceived as a negative overall effect to the fishery. However, in some cases, effort could be displaced to another area, which could compensate for potential economic losses if vessel operators choose not to operate in the wind energy areas.

There could also be social and economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable sources (AWEA 2020).

It remains unclear how fishing or transiting to and from fishing grounds (whether or not those grounds are within a wind farm) might be affected by the presence of a wind farm. While no offshore wind developers have expressed an intent to exclude fishing vessels from wind turbine arrays once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing and orientation of the array and weather conditions.[12] If vessel operators choose to avoid fishing or transiting within wind

[12] The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study, and has recommended uniform 1 mile spacing in east-west and

farms, effort displacement and additional steaming time could result in negative socioeconomic impacts to affected communities, including 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, and increased risk of allision and collision.

Impacts of Oil and Gas Development on Biological and Socioeconomic Resources

For oil and gas, this timeframe could include leasing and possible surveys, depending on the direction of BOEM's 5-year planning process in the North and Mid-Atlantic regions. (Note that there are fewer oil and gas development activities in the region than offshore wind; therefore, the non-fishing impacts focus more heavily on offshore wind.) Seismic surveys to detect and quantify mineral resources in the seabed impact marine species and the acoustic environment within which marine species live. These surveys have uncertain impacts on fish behaviors that could cumulatively lead to negative population level impacts. For protected species (sea turtle, fish, small cetacean, pinniped, large whale), the severity of these behavioral or physiological impacts is based on the species' hearing threshold, the overlap of this threshold with the frequencies emitted by the survey, as well as the duration of time the surveys would operate, as these factors influence exposure rate (Ellison et al. 2011, Ellison et al. 2018, Finneran 2015, Finneran 2016, Madsen et al. 2006, Nelms et al. 2016, Nowacek et al. 2007, Nowacek et al. 2015, NRC 2000, NRC 2003, NRC 2005, Piniak 2012, Popper et al. 2014, Richardson et al. 1995, Thomsen et al. 2006, Weilgart 2013). If fishery resources are affected by seismic surveys, then so in turn the fishermen targeting these resources would be affected. However, such surveys could increase jobs, which may provide some positive effects on human communities (BOEM 2020b). It is important to understand that seismic surveys for mineral resources are different from surveys used to characterize submarine geology for offshore wind installations, and thus these two types of activities are expected to have different impacts on marine species.

Offshore Energy Summary

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

north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (UCSG 2020).

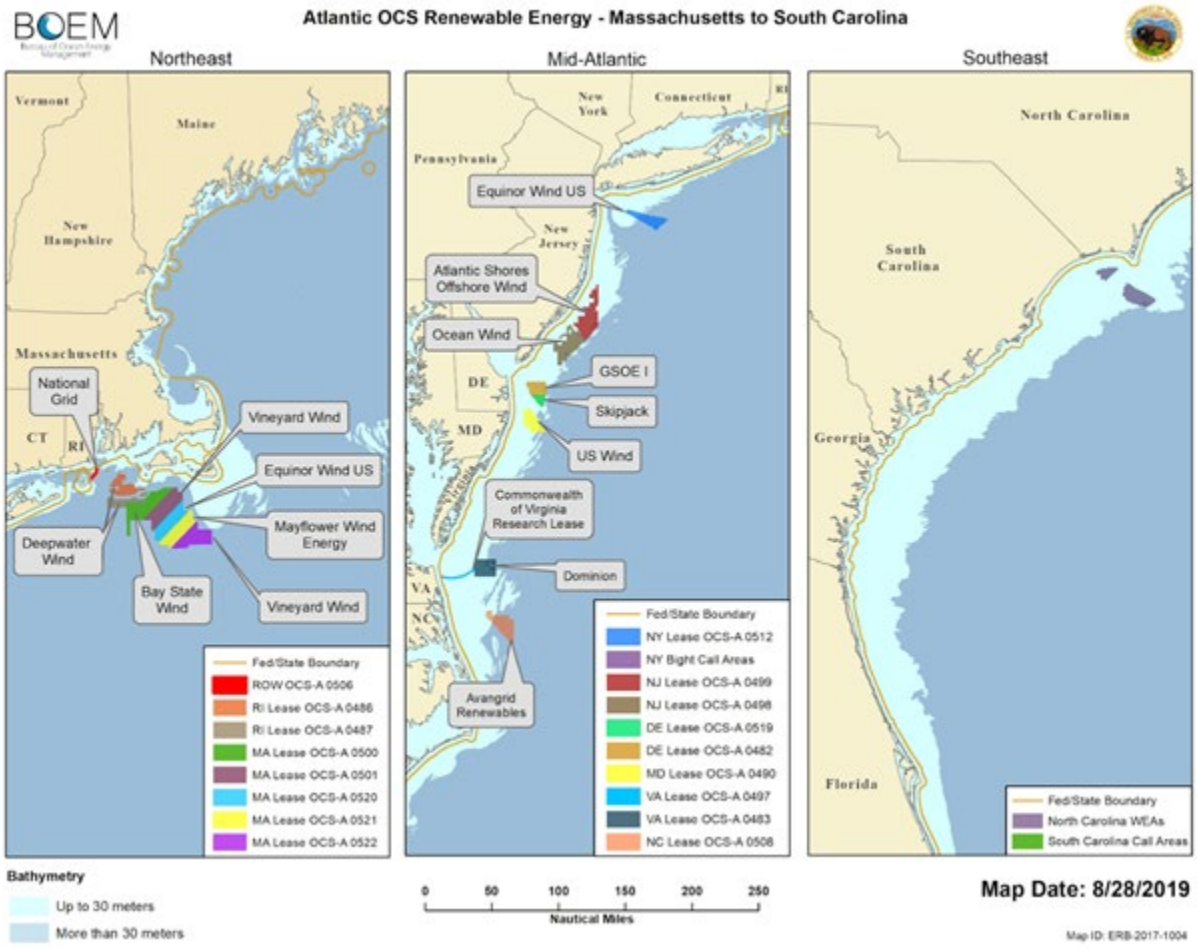


Figure 10. Map of BOEM Wind Planning areas, Wind Energy Areas, and Wind Leasing Areas on the Atlantic Outer Continental Shelf.

Source:
https://www.boem.gov/sites/default/files/uploadedImages/BOEM/Renewable_Energy_Program/Mapping_and_Data/ocs_wpa.jpg

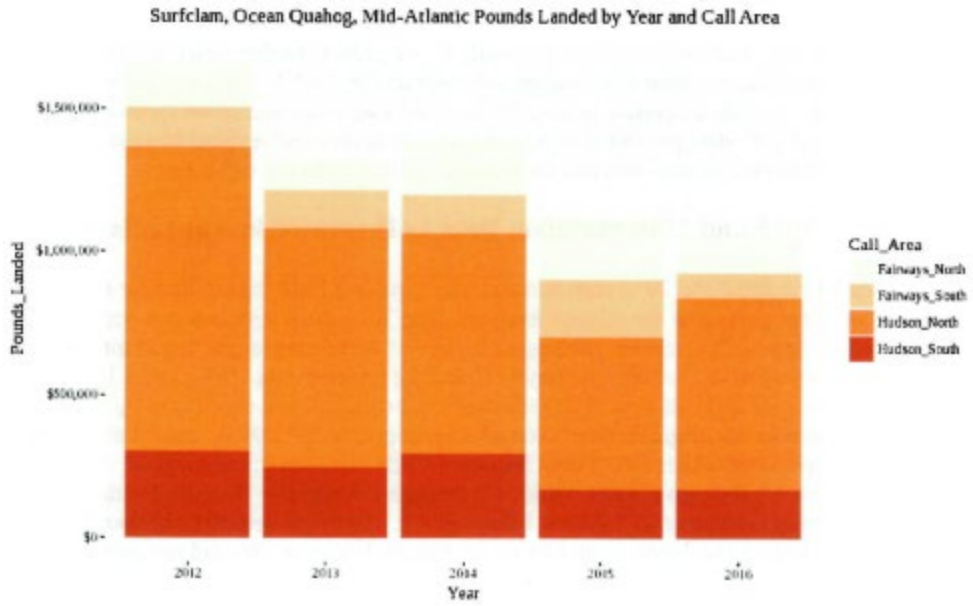


Figure 5.2 Surfclam and Ocean Quahog (Mid-Atlantic) FMP Revenue

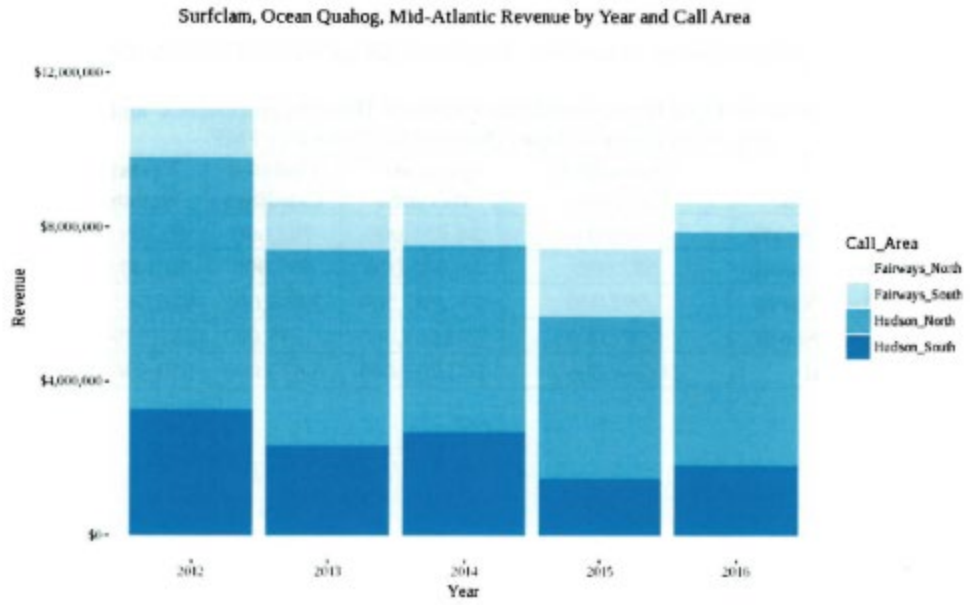


Figure 11. Surfclam and Ocean Quahog FMP landings and revenues (2012-2016) relative to wind energy call areas. Approximate revenues are based on VTR data. Source: Letter from Michael Pentony to Luke Feinberg dated July 30, 2018.

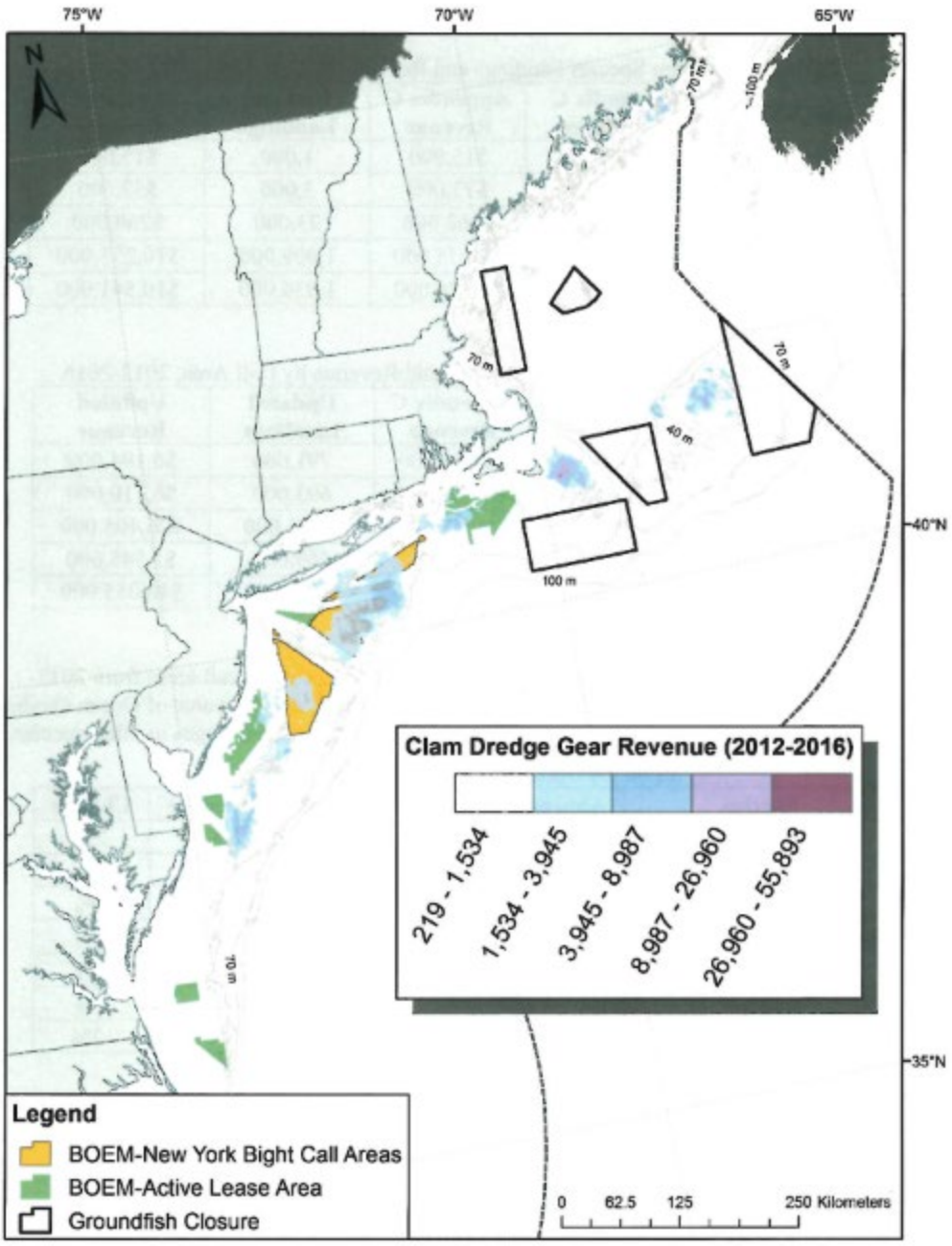


Figure 12. Sum of Surfclam and Ocean Quahog FMP revenues (2012-2016) relative to wind energy call areas and active lease areas. Approximate revenues are based on VTR data. Source: Letter from Michael Pentony to Luke Feinberg dated July 30, 2018.

7.3.2.2.2 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 rate 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). This assessment determined that surfclam have a high overall vulnerability to climate change. The exposure of surfclam to the effects of climate change was determined to be “high” due to the impacts of ocean surface temperature and ocean acidification. Exposure to these two factors occur during all life stages. All surfclam life stages use marine habitats. Surfclam spawning occurs in summer and early fall in warm water, starting earlier inshore than offshore. Surfclam eggs hatch into a trochophore larvae within 1-2 days of fertilization. Larvae cannot survive high temperatures. Juveniles and adults occur in coastal waters up to 66 m. The distributional vulnerability of surfclam was ranked as "high," as surfclam mortality is higher at higher temperatures. Surfclam was determined to have a “high” biological sensitivity to climate change as they form calcium carbonate shell and adults are sessile.

Ocean quahog had a very high overall vulnerability to climate change. Similar to surfclam, the exposure of ocean quahog to the effects of climate change was determined to be “high” due to the impacts of ocean surface temperature and ocean acidification. Exposure to these two factors occur during all life stages. All ocean quahog life stages use marine habitats. Ocean quahog is a cold-water, long-lived bivalve. Ocean quahog broadcast spawn over a protracted season and planktonic eggs mature into free-swimming trochophore, the pediveliger stage, swims, but also has a foot for burrowing. Temperatures affect growth rate. Juveniles occur in offshore sandy substrates and adults occur in dense beds over level bottom just below the surface sediments in medium to fine grain sand. Ocean quahog usually occur at depths between 25-61 m and temperature regulates the cross-shelf distribution. Also similar to surfclam, the distributional vulnerability was ranked as “high” as growth slows at higher temperatures. Ocean quahog was determined to have a “very high” biological sensitivity to climate due to population growth rate, sensitivity to ocean acidification, adult mobility, slow growth, from calcium carbonate shell, and adults are sessile (Hare et al. 2016). [13]

[13] Climate vulnerability profiles for individual species are available at: https://www.st.nmfs.noaa.gov/ecosystems/climate/northeast-fish-and-shellfish-climate-vulnerability/index

Overall climate vulnerability results for additional Greater Atlantic species, including some of the non-target species identified in this action, are shown in Figure 14 (Hare et al. 2016). While the effects of climate change may benefit some habitats and the populations of species through increased availability of food and nutrients, reduced energetic costs, or decreased competition and predation, a shift in environmental conditions outside the normal range can result in negative impacts for those habitats and species unable to adapt. That, 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 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 the 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 (MAFMC 2014).

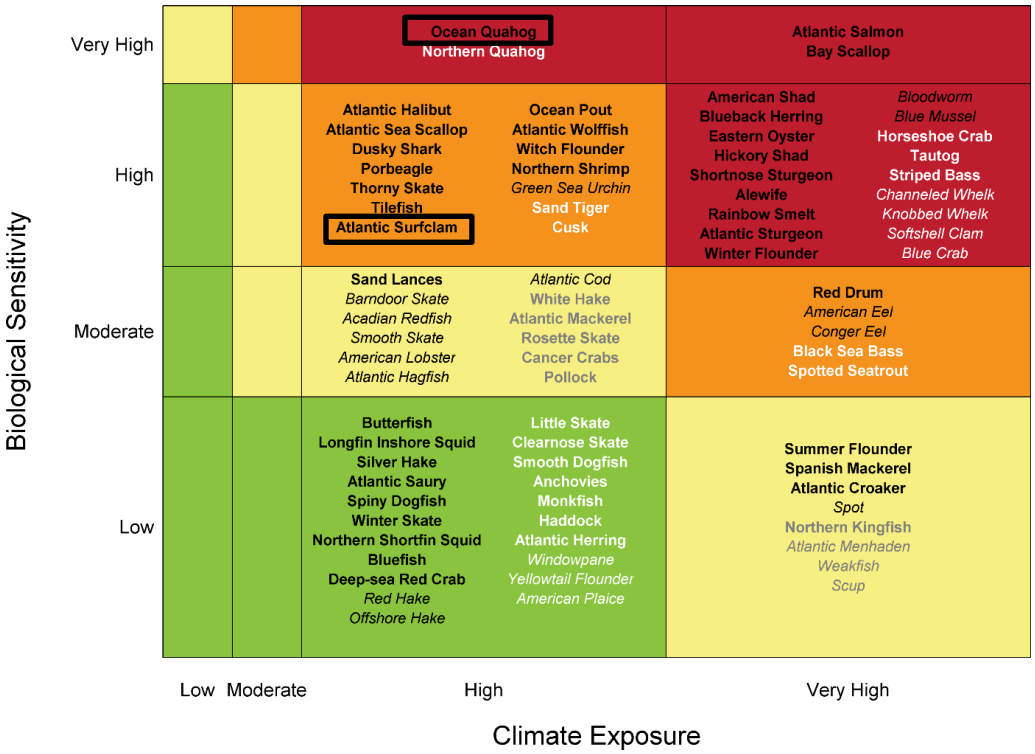


Figure 13. Overall climate vulnerability score for Greater Atlantic species, with surfclam and ocean quahog highlighted with black boxes. Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and 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.

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

For the purposes of this CEA, the baseline condition is considered as the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. Table 15 summarizes the added effects of the condition of the VECs (i.e., status/trends/stresses from affected environment and impacts) and the sum effect of the past, present, and reasonably foreseeable future actions (from previous summary table or past, present, reasonably foreseeable future action section above). The resulting CEA baseline for each VEC is exhibited in the last column of Table 15. As mentioned above, the CEA Baseline is then used to assess cumulative effects of the proposed management actions.

Table 15. Summary of the current status; combined effects of Past, Present, and Reasonably foreseeable future actions; and the combined baseline condition of each VEC.

VEC	Status and Trends	Combined Effects of Past, Present, and Reasonably Foreseeable Future Actions (Table 16)	Combined CEA Baseline Conditions
Managed Resource	Both surfclam and ocean quahog not overfished or overfishing; catches below catch limits and quotas	**Positive** Stocks are being managed sustainably	**Positive** Stocks are being managed sustainably
Non-target Species	Non-targets that are managed are not overfished or overfishing (section 6.1). Highly directed fishery, with low rates of non-targets relative to target species	**Positive** Decreased effort and reduced bycatch continue; most non-target stocks continue to be sustainably managed under ACLs/AMs	**Slight positive** Decreased effort and reduced bycatch continue; non-target stocks that are managed are not overfished/not overfishing
Habitat	Fishing impacts are complex and variable and typically adverse (see section 6.2). Effort reduction or gear modifications has reduced magnitude of the direct negative fishing impacts. Non-fishing activities have had historically negative but site-specific effects on habitat	**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	**Slight positive** Continued fisheries management will likely control effort and thus fishery related habitat impacts; fishing pressure will continue to occur, but overall knowledge of and protection of key habitats continues to improve
Protected Resources	Leatherback and Kemp's ridley sea turtles are classified as endangered under the ESA; loggerhead (NW Atlantic DPS) and green (North Atlantic DPS) sea turtles are classified as threatened. All large whales in the Northwest Atlantic are protected under the MMPA. Of these large whales, North Atlantic right, fin, blue, sei,	**Negligible to Slight Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions	**Negligible to Slight Positive** Continued catch and effort controls are likely to reduce gear encounters through effort reductions. Additional management actions taken under

	and sperm whales are also listed as endangered under the ESA. Small cetaceans and pinnipeds: protected under MMPA Atlantic salmon (Gulf of Maine DPS): threatened under ESA Atlantic sturgeon: New York Bight, Chesapeake, Carolina, and South Atlantic DPSs are endangered under ESA; Gulf of Maine DPS is listed as threatened under the ESA		ESA/MMPA should also help mitigate the risk of gear interactions
Human Communities	Surfclam and ocean quahog stocks support substantial industrial fisheries and related support services. 2019 estimated ex-vessel revenues were $28 and $19 million for surfclam and ocean quahog, respectively. Ports in New Jersey and Massachusetts handle the most volume and value, particularly Atlantic City and Point Pleasant, New Jersey, and New Bedford, Massachusetts. There are also landings in Ocean City, Maryland, and the Jonesport and Beals Island areas of Maine. The small scale Maine quahog fishery (6 vessels) is entirely for ocean quahog, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclam and ocean quahog, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products. In 2019, there were 64 surfclam and 33 ocean quahog allocations owners at the beginning of the fishing year. A total of 51 vessels were active in the ITQ fisheries in 2019, including a handful of independent vessels (less than 5)	**Mixed** Continued fisheries management will likely control effort and thus lead to short-term negative economic impacts for some participants and positive socioeconomic outcomes for other participants and communities	**Positive** Short-term negative impacts occur from effort limitations/cost recovery/data collection, but long-term positive conditions result from higher prices and continued management under ACLs and AMs. Resource supports viable communities and economies

7.3.3 Summary of the Effects of the Proposed Actions

The preferred alternatives (i.e., proposed action) include *status quo* measures for the commercial quotas for surfclam and ocean quahog (alternative 1) and a *status quo* alternative 1 that would suspend the minimum shell length (size) requirements for surfclam. These alternatives would continue to implement measures already in place for the fisheries in 2020 for 2021-2026. The impacts of the proposed actions are described in section 7.1 and 7.2 and summarized in ES-3 and ES-4.

7.3.4 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). Box ES-3 and ES-4 and section 7.1 and 7.2 provides a summary of likely impacts found in the various groups of management alternatives contained in this action. The CEA baseline described above in represents the sum of past, present, and reasonably foreseeable future actions and conditions of each VEC. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with "other" actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC. As seen above in section 7.3.2.2, non-fishing impacts on the VECs generally range from no impact to slight negative.

7.3.4.1 Magnitude and Significance of Cumulative Effects on Managed Species and Non-Target Species

Past fishery management actions taken through the federal fisheries management process such as catch limits and commercial quotas ensure that stocks are managed sustainably and that measures are consistent with the objectives for the FMP under the guidance of the MSA. The impacts of annual specification of catch limits and other management measures are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures are effective. The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on the managed species by achieving the objectives specified in the FMP. The combined impacts of past federal fishery management actions on non-target species have been generally positive, as decreased effort and reduced catch of non-target species continue. Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species. It is anticipated that the future management actions will have additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on which the productivity of surfclam and ocean quahog depend. Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, are cumulatively expected to yield non-significant positive impacts on target and non-target species (section 6.1).

7.3.4.2 Magnitude and Significance of Cumulative Effects on Habitat

Past fishery management actions taken through the federal fisheries management process have had positive cumulative effects on habitat. The actions have constrained fishing effort both at a large scale and locally which may reduce impacts on habitat. As required under these FMP actions, EFH and Habitat Areas of Particular Concern were designated for the managed stocks. It is anticipated that the future management actions will result in additional direct or indirect positive effects on

habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends.

Many additional non-fishing activities, as described above, are concentrated near-shore and likely work 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 and non-target species productivity, and associated fishery yields should be considered. For habitat, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and will likely continue to be, taken to improve the condition of habitat. Some actions, such as coastal population growth and climate change may impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management.

As described in section 7.1 and 7.2, the impacts of the proposed actions on habitat are expected to have slight negative impacts. The preferred alternatives are expected to maintain fishing effort compared to 2020. 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. Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, are cumulatively expected to yield non-significant impacts on habitat that range from slight negative to slight positive.

7.3.4.3 Magnitude and Significance of Cumulative Effects on Protected Species

As indicated in section 6.3, the commercial fisheries for surfclam and ocean quahog are prosecuted with hydraulic clam dredges, a type of bottom tending mobile gear. Based on available information, it has been determined that this action is not likely to affect protected species (ESA-listed and/or MMPA protected). This determination was made because either the occurrence of the species is not known to overlap with the surfclam and ocean quahog commercial fisheries and/or there have never been documented interactions between the species and the primary gear type (i.e., clam dredge) used to prosecute the fisheries.

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 6.0 (affected environment). Depending on species and status, the population trends for these protected resources are variable, and as follows:

Sea Turtles

Nest counts inform population trends for sea turtle species. In the affected environment (section 6.0), four sea turtle species were identified in the region: Northwest Atlantic Ocean DPS of loggerhead, Kemp's ridley, North Atlantic DPS of green, and leatherback sea turtles. 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, recent data from Florida index nesting beaches, which comprise most of the nesting in the DPS, indicate a 19 percent increase in nesting from 1989 to 2018 (https://myfwc.com/research/wildlife/sea-turtles/nesting/loggerhead-trends/). Overall, short-term trends for loggerhead sea turtles (Northwest Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable. For Kemp's ridley sea turtles, from 1980 through 2003, the number of nests at three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) increased 15 percent annually (Heppell et al. 2005); however, due to recent declines in nest counts, decreased survival of immature and adult sea turtles, and updated population modeling, this rate is not expected to continue and the overall trend is unclear (NMFS and USFWS 2015, Caillouet et al. 2018). The North Atlantic DPS of green sea turtle is showing a positive trend in nesting; however, increases in nester abundance for the North Atlantic DPS in recent years must be viewed cautiously as the datasets represent a fraction of a green sea turtle generation which is between 30 and 40 years (Seminoff et al. 2015). 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).

Large Whales

Large whale assessment indicates that for some species there is decreasing (i.e., North Atlantic right whales) trend in the population, while for other species, as a trend analysis has not been conducted, it is unknown what the population trajectory is.

Small cetaceans and Pinnipeds

For most small cetaceans and pinniped populations, it is unknown what the population trajectory is as a trend analysis has not been conducted for these populations. However, in the most recent stock assessment reports, population trends were provided for common bottlenose dolphin stocks and gray seals; the analysis indicated a declining trend in population size for all common bottlenose dolphin stocks and an increasing trend for the gray seal population (Hayes et al. 2018, Hayes et al. 2019, Hayes et al. 2020).

Atlantic Sturgeon

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

Atlantic Salmon

The GOM DPS of Atlantic salmon currently exhibits critically low spawner abundance and poor marine survival (USASAC 2020). The abundance of GOM DPS Atlantic salmon has been low

and either stable or declining over the past several decades and the proportion of fish that are of natural origin is small and displays no sign of growth (USASAC 2020).

As described in section 7.1 and 7.2, the proposed actions in this document are expected to have no impacts on protected species. Since monitoring of bycatch has begun, there have been no documented interactions of ESA and/or MMPA protected species and the fishing gear used to prosecute the surfclam and ocean quahog fisheries (see section 6.3 and 7.1, 7.2). 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 will result in additional indirect slight positive effects on protected species. These impacts could be broad in scope.

Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, are cumulatively expected to range from slight negative to slight positive impacts on human communities.

7.3.4.4 Magnitude and Significance of Cumulative Effects on Human Communities

Past fishery management actions taken through the federal fisheries management process have had both positive and negative cumulative socioeconomic effects by benefiting domestic fisheries through sustainable fishery management practices while also sometimes reducing the ability of some individuals to participate in fisheries. Sustainable management practices are, however, expected to yield broad positive impacts to fishermen, their communities, businesses, and the nation as a whole. It is anticipated that the future management actions described in 7.3.4 will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on some communities could occur if management actions result in reduced revenues. The same tradeoff exists for many non-fishing activities, resulting in overall negative impacts on human communities by reducing marine resource availability; however, this effect is non-quantifiable. Despite the potential for negative short-term effects on human communities due to reduced revenue, positive long-term effects are expected due to the long-term sustainability of the managed stocks. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects.

Catch limits, and commercial quotas for each of the managed resources have been specified to ensure these rebuilt stocks are managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts of annual specification of catch limits and other management measures are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures are effective. The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on human communities by achieving the objectives specified in the FMP. As described in section 7.1 and 7.2, the proposed actions in this document are not expected to have impacts on the prosecution

of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. The preferred alternatives are expected to maintain fishing effort and landings levels compared to 2020. Positive not significant long-term effects are expected due to the long-term sustainability of the managed stocks. Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, are cumulatively expected to be slight positive impacts on human communities.

7.3.5 Proposed Action on all the VECs

The Council's preferred alternatives (i.e., the proposed action) are described in section 5.0. The direct and indirect impacts of the proposed action on the VECs are described in sections 7.1 through 7.2 and summarized in the Executive Summary (section 1.0). The magnitude and significance of the cumulative effects, including additive and synergistic effects of the proposed action, as well as past, present, and future actions, have been taken into account.

When considered in conjunction with all other pressures placed on the fisheries by past, present, and reasonably foreseeable future actions, the preferred alternatives are not expected to result in any significant impacts, positive or negative. The preferred action for implementing catch and landings limits for surfclam and ocean quahog in 2021-2026 and implementing a surfclam minimum shell length requirement are the *status quo* measures. These measures are not expected alter the current stock status and condition of surfclam and ocean quahog and non-target species (which are slight positive), the condition of physical habitat (slight negative), the condition of protected species (slight negative), or the condition of the human communities (slight positive).

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

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

There are no significant cumulative effects associated with the preferred alternatives based on the information and analyses presented in this document and in past FMP documents (Table 16). Cumulatively, through 2026, it is anticipated that the preferred alternatives will result in a range of non-significant impacts on all VECs ranging from no impact to positive.

Table 16. Magnitude and significance of the cumulative, additive, and synergistic effects of the 2021-2026 preferred alternatives, as well as past, present, and reasonably foreseeable future actions.

VEC	Current Status	Combined Cumulative Effects Assessment Baseline Conditions	Direct/Indirect Impacts of the Preferred Actions (Alt. 1: *status quo*) on current conditions	Significant Cumulative Effects
Managed Resource	Complex and variable (Section 6.1)	Positive (Sections 7.3.4.1)	Slight positive (Sections 7.1.1.4)	**None**
Non-target Species	Complex and variable (Section 6.1)	Positive (Sections 7.3.4.1)	Slight positive (Sections 7.1.1.4)	**None**
Habitat	Complex and variable (Section 6.2)	Slight negative to slight positive (Sections 7.3.4.2)	Slight negative (Sections 7.1.2.4)	**None**
Protected Resources	Complex and variable (Section 6.3)	Slight negative to slight positive (Sections 7.3.4.3)	No impact (Sections 7.1.3.2)	**None**
Human Communities	Complex and variable (Section 6.4)	Slight positive (Sections 7.3.4.4)	Slight positive (Sections 7.1.4.4)	**None**

8.0 APPLICABLE LAWS

8.1 Magnuson-Stevens Fishery Conservation and Management Act (MSA)

8.1.1 National Standards

Section 301 of the MSA requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. The Council continues to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that will continue to prevent overfishing, while achieving, on a continuing basis, the optimum yield (OY) for surfclam and ocean quahog, and the U.S. fishing industry. To achieve OY, both scientific and management uncertainty are addressed when establishing catch limits. The Council developed recommendations that do not exceed the ABC recommendations of the SSC, which explicitly address scientific uncertainty. The Council considered management uncertainty and other social, economic, and ecological factors, when recommending ACTs. The Council uses the best scientific information available (National Standard 2) and manages surfclam and ocean quahog throughout their range (National Standard 3). These management measures do not discriminate among residents of different states (National Standard 4) and they do not have economic allocation as their sole purpose (National Standard 5). The measures account for variations in the fisheries (National Standard 6) and avoid unnecessary duplication (National Standard 7). They take into account the fishing communities (National Standard 8) and they promote safety at sea (National Standard 10). The proposed actions are consistent with National Standard 9, which addresses bycatch in fisheries. NOAA Fisheries has implemented many regulations that have indirectly reduced fishing gear impacts on EFH. By continuing to meet the National Standards requirements

of the MSA through future FMP amendments, framework actions, and the annual specification setting process, the Council will ensure that cumulative impacts of these actions will remain positive overall for the managed species, the ports and communities that depend on these fisheries, and the Nation as a whole.

8.1.2 Essential Fish Habitat Assessment

EFH assessments are required for any action that is expected to have an adverse impact on EFH, even if the impact is only minimal and/or temporary in nature (50 CFR Part 600.920 (e) (1-5)).

Description of Action

As previously described, the proposed action would implement catch and landings limits for the surfclam and ocean quahog fisheries for 2021-2026. The proposed actions are described in more detail in section 5.0.

Potential Adverse Effects of the Action on EFH

The types of habitat impacts caused by hydraulic dredges used in the surfclam and ocean quahog fisheries are summarized in section 6.2.3.

As described in section 7.0, under the proposed 2021-2026 surfclam and ocean quahog specifications, the commercial quotas are expected to remain the same compared to currently implemented 2020 levels. Therefore, fishing effort for surfclam and ocean quahog are expected to remain the same in 2021-2026. The proposed quota levels for 2021-2020 have been in place for over 15 years (section 6.1.2). The locations of fishing are not expected to change and the amount of gear in the water and duration of time that gear is in the water are not expected to increase substantially in a manner that would cause meaningful increased negative impacts on habitat. The habitats that are impacted by surfclam and ocean quahog have been impacted by many fisheries over many years. The levels of fishing effort expected under the preferred alternative are not expected to cause additional habitat damage, but they are expected to limit the recovery of previously impacted areas. Thus, the proposed action for surfclam and ocean quahog is expected to have slight negative impacts on habitat and EFH.

Proposed Measures to Avoid, Minimize, or Mitigate Adverse Impacts of This Action

The commercial fisheries for surfclam and ocean quahog are prosecuted with clam dredges, a type of bottom tending mobile gear. As indicated in section 6.2.3, the Council determined in Amendment 13 that there may be some adverse effects of clam dredging on EFH, but that the effects are short-term and minimal because the fisheries occurs in a relatively small area (compared to the area impacted by scallop dredges or bottom trawls) and primarily in high energy sand habitats. Amendment 13 indicates that biological communities would recover within months to years (depending on what species was affected) and physical structure within days in high energy environments and within months in low energy environments. Even in areas where habitat may be impacted by commercial gear or vessels, these areas are typically commonly fished by many vessels over many decades and are unlikely to see a measurable improvement in their condition in

response to minor changes in measures or short-term changes in effort in an individual commercial fishery.

As detailed in section 6.2.3, the OHA2 developed by the NEFMC employed a spatial explicit model (SASI) to estimate habitat vulnerability incorporating gear-specific susceptibility (S) and recovery (R) scores for a number of geological and biological habitat features in various subtracts. Based on the results of the SASI model, the OHA2 implemented mobile bottom-tending gear restrictions throughout various HMAs selected by the NEFMC (Figures 5-6). In addition, the OHA2 included an exemption for hydraulic clam dredges in many of the HMAs and included a provision for clam dredge exemption for Georges Bank-Nantucket Shoals for a year after implementation of OHA2 to allow time for the NEFMC to consider creating access areas within two of the areas included in the alternatives. As indicated above, these fisheries were granted a one-year exemption (which expired on April 8, 2019) for the Great South Channel and Georges Shoal HMAs following implementation of OHA2. The NEFMC identified areas that may be suitable for an exemption through a Framework Adjustment to the FMP. The final rule (published May 19, 2020) allows the surfclam fishery to operate hydraulic dredge gear year-round in two small areas (McBlair and Fishing Rip) and seasonally in a third area (Old South) within the Great South Channel HMA. Mussel dredge fishing is also be allowed in these exemption areas.

Section 6.2.3. lists examples of management measures previously implemented with the intent of minimizing the impacts of various fisheries on habitat. None of these measures substantially restrict the surfclam or ocean quahog fisheries.

Conclusions

Overall, the preferred alternatives are expected to have slight negative impacts on EFH; therefore, an EFH consultation is required.

8.2 NEPA FINDING OF NO SIGNIFICANT IMPACT (FONSI)

The Council on Environmental Quality Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 CFR 1508.27). In addition, the companion manual for NOAA Administrative Order 216-6A provides sixteen criteria (the same ten as the Council on Environmental Quality Regulations and six additional) for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

The expected impacts of the proposed action (i.e., the suite of preferred alternatives) are fully described in section 7.0. The preferred alternatives are not expected to result in significant impacts on any VECs, nor will they result in overall significant effects, either beneficial or adverse.

None of the proposed preferred alternatives presented in this document is expected to jeopardize the sustainability of any target species affected by the action. The preferred alternatives to establish catch and landing limits for each species and suspend the minimum shell length for surfclam are consistent with the FMP objectives and the recommendations of the Council's SSC. The proposed catch and landing limits are designed to prevent the stocks from becoming overfished and to prevent overfishing from occurring.

The preferred action for implementing catch and landings limits for surfclam and ocean quahog in 2021-2026 and implementing a surfclam minimum shell length requirement are the *status quo* measures. These measures are not expected alter the current stock status and condition of surfclam and ocean quahog and non-target species (which are slight positive), the condition of physical habitat (impact is slight negative), the condition of protected species (impact is slight negative), or the condition of the human communities (impact is slight positive).

These *status quo* measures are the same as previous years and expected to result in similar levels of fishing effort for surfclam and ocean quahog, and similar revenues (section 7.1 and 7.2). These measures are not expected alter the current stock status and condition of surfclam and ocean quahog and non-target species (which are slight positive).

None of the preferred alternatives are expected to result in notable changes in interactions between fishing gear and protected species (section 7.1 and 7.2) or between fishing gear and physical habitat (section 7.1 and 7.2). As such, the preferred (*status quo*) alternatives are not expected to alter the current conditions of these resources, both of which are slight negative.

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

None of the preferred alternatives alter the manner in which the industry conducts fishing activities for the target species. Therefore, no changes in fishing behavior that would affect safety are anticipated. The overall effect of the proposed actions on these fisheries, including the communities in which they operate, will not adversely impact public health or safety.

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

The preferred alternatives are not expected to alter fishing methods or activities or to substantially increase fishing effort. This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries, and continues the surfclam minimum shell length suspension. Other types of commercial fishing already occur in the impacted areas. Although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid fishing too close to most physical structures due to possible loss or entanglement of fishing gear. Therefore, it is not likely that the proposed action would result in substantial impacts to unique areas.

4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

The impacts of the proposed measures on the human environment are described in section 7.0. This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries, and continues the surfclam minimum shell length suspension. The proposed action is based on measures contained in the FMP, which have been in place for many years. The scientific information upon which the annual quotas are based has been peer reviewed and is the most recent information available. Thus, the measures contained in this action are not expected to be highly controversial.

5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

The impacts of the proposed measures on the human environment are described in section 7.0. This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries, and continues the surfclam minimum shell length suspension. None of the proposed specifications is expected to alter fishing methods or activities or is expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The impacts to managed species, non-target species, and protected resources will continue to be monitored. The measures contained in this action are not expected to have highly uncertain effects or to involve unique or unknown risks on the human environment.

6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

This action merely implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries, and continues the surfclam minimum shell length suspension. None of the proposed specifications is expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. When new stock assessment or other biological information about these species becomes available in the future, then the specifications will be adjusted consistent with the FMP and MSA. Specifications are routine adjustments and the adjustments undertaken herein are similar to those taken in the past. None of these specifications results in significant effects, nor do they represent a decision in principle about a future consideration. The impact of any future changes will be analyzed as to their significance in the process of developing and implementing them.

7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

As discussed in section 7.3, the proposed action is not expected to have individually insignificant, but cumulatively significant impacts. The preferred alternatives, together with past, present, and reasonably foreseeable future actions, are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

8. Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?

The impacts of the proposed measures on the human environment are described in section 7.0. This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries, and continues the surfclam minimum shell length suspension. The preferred alternatives are not expected to alter fishing practices. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels typically avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the proposed action would adversely affect the historic resources listed above.

9. Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?

The commercial fisheries for surfclam and ocean quahog are prosecuted with hydraulic clam dredges, a type of bottom tending mobile gear. The preferred alternatives are not expected to alter fishing methods or activities or to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Based on this information, and the fact that there have never been observed or documented interactions between ESA-listed species and hydraulic clam dredge gear (see section 6.3), the preferred alternatives are not expected to impact ESA listed species.

In addition, as provided in section 6.3, operation of the surfclam and ocean quahog fishery will not adversely affect North Atlantic right whale critical habitat; the proposed action does not result in any changes in the fishery that would change this determination. Given this and the information above, this action is not expected to affect ESA listed species or designated critical habitat in any manner not considered in previous consultations on the fisheries.

10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries, and continues the surfclam minimum shell length suspension. None of the proposed specifications is expected to alter fishing methods or activities such that they threaten a violation of federal, State, or local law or requirements imposed for the protection of the environment. The proposed measures have been found to be consistent with other applicable laws (sections 8.3-8.11 below).

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

The surfclam and ocean quahog fishery is prosecuted with hydraulic clam dredges. The preferred alternatives are not expected to alter fishing methods or activities or to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Based on this information, and the fact that there have never been observed documented interactions between MMPA protected species and hydraulic clam dredge gear (see section 6.3), the preferred alternatives are not expected to impact MMPA protected species. Given this, this action is not expected to affect MMPA protected species in any manner not considered in previous consultations on the fisheries.

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

The impacts of this action on managed fish species, including target and non-target species, are described in section 7.1-7.7. None of the proposed specifications presented in this document is expected to jeopardize the sustainability of any target or non-target species affected by the action. The preferred alternatives to establish catch and landing limits for each species and suspend the minimum shell length for surfclam are consistent with the FMP objectives and the recommendations of the Council's SSC. The proposed measures are not expected to result in overfishing of surfclam and ocean quahog. The proposed actions will ensure the long-term sustainability of harvests from the surfclam and ocean quahog stocks. For non-target species, most species are not currently overfished and not experiencing overfishing (section 6.1.3). As described in section 7.0, fishing effort is not expected to change under any of these alternatives in a manner that would substantially impact non-target species. The proposed alternatives are not expected to have any significant adverse impacts on managed target or non-target fish species.

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

The proposed action is not expected to cause substantial damage to EFH as defined under the MSA and identified in the FMPs. The commercial fisheries are primarily prosecuted with hydraulic clam dredges, a type of bottom tending mobile gear, which can adversely impact EFH (section 6.2.3). The fisheries occurs in a relatively small area (compared to the area impacted by scallop dredges or bottom trawls) and primarily in high energy sand habitats. As previously stated, the preferred alternative includes maintaining the current surfclam and ocean quahog quotas. These quotas levels have been in place for over 15 years. These quota levels are not expected to alter fishing methods or activities or is expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The areas fished for surfclam and ocean quahog have been fished for many years, and are unlikely to be degraded further as the result of the levels of fishing effort that are expected under the proposed action. The proposed actions are expected to result in no impacts to habitat as the result of continued fishing (section 7.1.2).

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

The preferred alternatives are not expected to have significant impacts on the natural or physical environment, including vulnerable marine or coastal ecosystems. The preferred alternatives are not expected to alter fishing methods or activities or to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The areas fished for surfclam and ocean quahog have been fished for many years, and for a variety of species, and this action is not expected to change the locations of fishing activity. While some fishing takes place near the continental slope/shelf break where deep sea corals may be found in and around the submarine canyons, much of this area in the Mid-Atlantic is now protected by a prohibition on bottom-tending gear in the Frank R. Lautenberg Deep Sea Coral Protection Area (81 FR 90246; December 14, 2016). A proposed rule to establish similar coral protections off New England published on January 2, 2020 (85 FR 285). The preferred alternatives are not expected to alter surfclam and

ocean quahog fishing patterns relative to this protected area or in any other manner that would lead to adverse impacts on deep sea coral or other vulnerable marine or coastal ecosystems.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

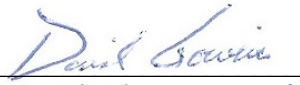
This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries and continues the suspension of the minimum shell length requirement for surfclam. The impacts of the surfclam and ocean quahog fishery on biodiversity and ecosystem functioning have not been assessed; however, the impacts to components of the ecosystem (i.e., non-target species, habitat, and protected species) have been considered. As described in section 7.0, the preferred alternatives are not expected to result in changes in fishing effort relative to the *status quo* and would allow for continued fishing activity to at similar levels. The preferred alternatives are not expected to result in a change in the recent spatial/temporal distribution of effort. These expected levels of effort are not likely to negatively impact the stock status of non-target species (section 7.1), they are not likely to cause additional habitat damage beyond that previously caused by a variety of fisheries (section 7.2), and they are not expected to jeopardize any protected species (section 7.3). For these reasons, the preferred alternatives are not expected to have a substantial impact on biodiversity and ecosystem function within the affected area.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

This action implements catch and landings limits in 2021-2026 for the surfclam and ocean quahog fisheries and continues the surfclam minimum shell length suspension. There is no evidence or indication that these fisheries have ever resulted in the introduction or spread of nonindigenous species. None of the proposed specifications is expected to alter fishing methods or activities. None of the proposed specifications is expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, it is highly unlikely that the proposed action would be expected to result in the introduction or spread of a non-indigenous species.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting EA prepared for the 2021-2026 Atlantic surfclam and ocean quahog fisheries, it is hereby determined that the proposed actions in this specification package will not significantly impact the quality of the human environment as described above and above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.



for _____ April 28, 2021

Regional Administrator for GARFO, NMFS, NOAA *Date*

8.3 Endangered Species Act

Sections 6.3 and 7.0 should be referenced for an assessment of the impacts of the proposed action on ESA-listed protected species. None of the specifications proposed in this document are expected to alter fishing methods or activities. Therefore, this action is not expected to affect endangered or threatened species or critical habitat in any manner not considered in previous consultations on the fisheries.

8.4 Marine Mammal Protection Act

Sections 6.3 and 7.0 should be referenced for an assessment of the impacts of the proposed action on and MMPA protected species. None of the specifications proposed in this document are expected to alter fishing methods or activities. Therefore, this action is not expected to affect marine mammals in any manner not considered in previous consultations on the fisheries.

8.5 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, provides measures for ensuring the stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council will submit this document to NMFS. NMFS must determine whether this action is consistent to the maximum extent practicable with the CZM programs for each state (Maine through Virginia).

8.6 Administrative Procedure Act

Sections 551-553 of the Federal Administrative Procedure Act establish procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process and to give the public notice and opportunity to comment before the agency promulgates new regulations.

The Administrative Procedure Act requires solicitation and review of public comments on actions taken in the development of an FMP and subsequent amendments and framework adjustments. Development of this specifications document provided many opportunities for public review, input, and access to the rulemaking process. This action and the proposed specifications document was developed through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on management measures during the AP meeting held July 8, 2020, SSC meeting held on July 22, 2020, and during the MAFMC meeting held on August 10-13, 2020. In addition, the Council accepts written comments on any issues to come before the Council consistent with their public comment policy.

The public will have further opportunity to comment on this specifications document once NMFS publishes a request for comments notice in the FR.

8.7 Section 515 (Data Quality Act)

Utility of Information Product

This action proposes commercial quotas in 2021-2026 for the surfclam and ocean quahog fisheries and continued suspension of the surfclam minimum shell length requirement. This document includes a description of the alternatives considered, the preferred action and rationale for selection, and any changes to the implementing regulations of the FMP. As such, this document enables the implementing agency (NMFS) to make a decision on implementation of annual specifications (i.e., management measures) and this document serves as a supporting document for the proposed rule.

The action contained within this specifications document was developed to be consistent with the FMP, MSA, and other applicable laws, through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on management measures during a number of public meetings (see section 8.6). The public will have further opportunity to review and comment on this specifications document once NMFS publishes a request for comments notice in the FR.

Integrity of Information Product

The information product meets the standards for integrity under the following types of documents: Other/Discussion (e.g., Confidentiality of Statistics of the MSA; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the MMPA).

Objectivity of Information Product

The category of information product that applies here is "Natural Resource Plans." This section (section 8.0) describes how this document was developed to be consistent with any applicable laws, including MSA with any of the applicable National Standards. The analyses used to develop the alternatives (i.e., policy choices) are based upon the best scientific information available and the most up to date information is used to develop the EA which evaluates the impacts of those alternatives (section 7.0). The specialists who worked with these core data sets and population assessment models are familiar with the most recent analytical techniques and are familiar with the available data and information relevant to the surfclam and ocean quahog fisheries.

The review process for this specifications document involves MAFMC, NEFSC, GARFO, and NMFS headquarters. The NEFSC technical review is conducted by senior level scientists with specialties in fisheries ecology, population dynamics and biology, as well as economics and social anthropology. The MAFMC review process involves public meetings at which affected stakeholders have the opportunity to comments on proposed management measures. Review by GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected resources, and compliance with the applicable law. Final approval of the specifications document and clearance of the rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.8 Paperwork Reduction Act

The Paperwork Reduction Act (PRA) concerns the collection of information. The intent of the PRA is to minimize the federal paperwork burden for individuals, small businesses, state and local governments, and other persons as well as to maximize the usefulness of information collected by the Federal government. There are no changes to the existing reporting requirements previously approved under this FMP for vessel permits, dealer reporting, or vessel logbooks. This action does not contain a collection-of-information requirement for purposes of the PRA.

8.9 Impacts of the Plan Relative to Federalism/EO 13132

This specifications document does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order (EO) 13132.

8.10 Regulatory Flexibility Act Analysis

The Regulatory Flexibility Act (RFA), first enacted in 1980, and codified at 5 U.S.C. 600-611, was designed to place the burden on the government to review all new regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization can have a bearing on its ability to comply with Federal regulations. Major goals of the RFA are: 1) to increase agency awareness and understanding of the impact of their regulations on small business; 2) to require that agencies communicate and explain their findings to the public; and 3) to encourage agencies to use flexibility and to provide regulatory relief to small entities.

The RFA emphasizes consideration of alternatives that may minimize significant adverse impacts on small entities, while still achieving the stated objective of the action. When an agency publishes a proposed rule, it must either, (1) certify that the proposed action will not have a significant adverse impact on a substantial number of small entities and provide a supporting factual basis, or, (2) if such a certification cannot be supported by a factual basis, prepare and make available for public review an Initial Regulatory Flexibility Analysis (IRFA) that describes the impact of the proposed rule on small entities.

This document provides the factual basis supporting a certification that the proposed regulations will not have a "significant impact on a substantial number of small entities" and that an IRFA is not needed in this case.

8.10.1 Basis and Purpose of the Rule

This action is taken under the authority of the MSA and regulations at 50 CFR part 648. Section 4.1 of this document summarizes the purpose and need and objectives of this action. There are only four regulatory actions contemplated in this document: 1) Specifying a maximum landings limit (quota) for Atlantic surfclam in federal waters for the years 2021-2026; 2) Specifying a maximum landings limit (quota) for ocean quahog in federal waters for the years 2021-2026 outside the Maine (mahogany) ocean quahog zone; 3) Specifying a maximum landings limit (quota) for ocean quahog in the Maine (mahogany) ocean quahog zone for the years 2021-2026;

and 4) Making a determination as to whether the minimum size limit of 4.75 inches (12.065 cm) for surfclam should continue to be suspended for 2021-2026. The proposed actions are critical components of the management program developed for surfclam and ocean quahog in federal waters, and the Maine (mahogany) ocean quahog zone.

As indicated in section 4.0, the proposed actions in this specifications document would establish annual quotas in these fisheries which are necessary to maintain the harvest of surfclam and ocean quahog at sustainable levels. The preferred quota alternatives proposed in this document would not have adverse impact as in all cases the recommended alternatives preserve the *status quo*, resulting in no decrease in harvest levels or revenues relative to those currently experienced. The proposed action (i.e., the suite of preferred alternatives) are fully described under alternative 1 (*status quo*/least restrictive alternative) in sections 5.1 thru 5.7, and are briefly described below.

The proposed surfclam quota for each of the 2021-2026 fishing years is 3.40 million bushels. This quota level is identical to the 2017-2020 quota (in fact, the proposed quota levels for all species have been in place since the early-2000s), as such, it is expected that fishing opportunities would remain the same. In addition, the Council recommends that the surfclam minimum shell length requirement (4.75 inches (12.065 cm)) remain suspended in 2021-2026.

The proposed non-Maine ocean quahog quota for each of the 2021-2026 fishing years is 5.36 million bushels. This quota level is identical to the 2017-2020 quota, as such, it is expected that fishing opportunities would remain the same.

The proposed Maine ocean quahog fishery quota for each of the 2021-2026 fishing years is 100,000 Maine bushels. This quota level is identical to the 2017-2020 quota, as such, it is expected that fishing opportunities would remain the same.

The surfclam and ocean quahog fisheries have a successfully implement ITQ management programs, which provides substantial benefits to fishery participants. The monitoring the status of these living resources and determination of the maximum quantity that can be safely removed from them each year, without damaging their health or the health of the ecosystem in which they reside, is an ongoing process.

The ITQ system implemented for these fisheries enables much higher net benefits by removing the incentives for overcapitalization and derby fishing. The privileges to harvest the annual quotas are assigned to allocation holders at the outset of each year, with each receiving a specific number of cage tags that equates to their percentage share of the quota for that year. They are then free to harvest the allocation themselves, or lease it to others if they choose. Market forces will tend to steer these allocations to the best captains and most efficient vessels, since they will be able to generate the highest profits and offer the highest leasing prices to allocation owners.

This system could not function without the annual specification of quotas, which is a primary reason for the regulatory action proposed in this document. A second critical function of annual quotas is to prevent overfishing and obtain the optimal yield from a fishery.

As described in sections 4.0 and 5.0, the proposed commercial quotas are consistent with the best scientific information available and are intended to prevent overfishing.

Additional non-preferred alternatives were also considered. All alternatives are described in detail in section 5.0. For the purposes of the RFA, only the preferred alternatives and those non-preferred alternatives which would minimize negative impacts to small businesses are considered. The preferred alternative for 2021-2026 surfclam and ocean quahog commercial quotas (i.e., alternative 1; *status quo*/least restrictive alternative), would result in higher commercial quotas compared to alternatives 2 and 3. Alternatives 2 and 3, are more restrictive than necessary to prevent overfishing and ensure ACLs are not exceeded. Therefore, these alternatives are not considered further in this section.

8.10.2 Description and Number of Entities to Which the Rule Applies

The measure proposed by this action apply to surfclam and ocean quahog allocation owners. These are the individuals or entities that received initial ITQ allocations (i.e., owners of record) at the beginning of each fishing year. There were 64 allocation owners of record for surfclam and 33 for ocean quahog in 2019.

The North American Industry Classification System Codes (NAICS) were used to categorize businesses by industry description (e.g., commercial harvester, fish and seafood merchant wholesalers, financial institution, etc.). As an example, the small business administration (SBA) defines a small business in the commercial fishing industry as a firm with total annual receipts (gross revenues) not in excess of $11.0 million. Table 17 shows the standard size (threshold) for small businesses by industry description that were used to categorize the surfclam and ocean quahog initial allocation owners of record for 2019. The Greater Atlantic Regional Fisheries Office of the National Marine Fisheries Service maintains current ownership records of surfclam and ocean quahog allocation holders. Allocation ownership is a matter of public record, and a list of the current owners of record may be found at:
https://www.fisheries.noaa.gov/management-plan/atlantic-surfclam-and-ocean-quahog-management-plan.

Council staff used the Small Business Administration table of Small Business Size Standards matched to the NAICS Codes to categorize the 2019 initial allocation owners of record (Table 17). For example, commercial banking and credit unions appear as allocation owners of record, as some financial institutions serve as transfer agents and hold quota on behalf of others or in lieu of collateral for loans. Other frequently found industry classifications are commercial fishing, and fish and seafood merchant wholesalers. In some cases, the available information on owner of record did not allow for an immediately clear SBA classification. In these cases, Council staff used publicly available information found online to assign an SBA classification to those owners of record. There were also various instances where Council staff did not have sufficient information to assign a specific SBA classification to an owner of record. As such, there are few allocation owners of record that do not have a specific industry classification (i.e., unknown industry classification). This is the same methodology used in the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment (Amendment 20) to categorize allocation owners of record. Amendment 20 proposes to implement excessive shares cap level to ensure that no individual,

corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges.

Of the 64 initial surfclam allocation owners of record for 2019, 19 were categorized as "Commercial Fishing," with 100 percent of them classified as small entities. Of the 9 allocation owners that were categorized as "Fish and Seafood Merchant Wholesalers," 1 was classified as small entities (11 percent) and 8 were classified as large entities (89 percent). Eight allocations owners of record were categorized as "Commercial Banking," 1 was classified as small entity (12 percent) and 7 were classified as large entities (88 percent). Six allocations owners of record were categorized as "Credit Unions," with 100 percent of them classified as large entities. Two allocation owners of record were associated with "Trust, Fiduciary and Custody Activities;" however, due to lack of information of all revenue levels for these two "Trust, Fiduciary and Custody Activities," it was not possible to make a small versus large classification within this group. Nevertheless, if we were to assume that all revenue levels generated by these two "Trust, Fiduciary and Custody Activities," were to be derived from the surfclam allocation alone (surfclam bushels only), then they would be considered small entities, as they were both allocated very small quantities of surfclam allocation in 2019. There were also 5 allocation owners of record categorized as "Sector 92" (Public Administration sector); and therefore, small business size standards are not applicable for these 5 allocation owners. There was one allocation owner of record classified as a large bank but no allocation was issued to thet entity at the beginning of 2019 (around 57,000 bushels). Lastly, the SBA classification for 17 surfclam allocation owners was unknown.

Of the 33 initial ocean quahog allocation owners of record for 2019, 14 were categorized as "Commercial Fishing," with 100 percent of them classified as small entities. Of the 6 allocation owners that were categorized as "Fish and Seafood Merchant Wholesalers," 2 were classified as small entities (33 percent) and 4 were classified as large entities (67 percent). One allocation owners of record was categorized as "Commercial Banking" and 1 categorized as "Credit Unions;" with 100 percent of them classified as large entities. Two allocation owners of record were associated with "Trust, Fiduciary and Custody Activities;" however, due to lack of information of all revenue levels for these two "Trust, Fiduciary and Custody Activities," it was not possible to make a small versus large classification within this group. Nevertheless, if we were to assume that all revenue levels generated by these two "Trust, Fiduciary and Custody Activities," were to be derived from the ocean quahog allocation alone (ocean quahog bushels only), then they would be considered small entities, as they were both allocated very small quantities of ocean quahog allocation in 2019.

There were 3 allocation owners of record (2 small "Commercial Fishing" and 1 small "Fish and Seafood Merchant Wholesalers") that were not issued allocations (around 65 bushels, 1,451 bushels, and 384 bushels, respectively) at the beginning of 2019. Lastly, the SBA classification for 6 ocean quahog allocation owners was unknown.

Table 17. Small and Large surfclam and ocean quahog 2019 initial allocation owners of record by industry classification.

NAICS Codes	NAICS Industry Description	Size Standards in millions of dollars (those preceded by "$") or number of employees (those without the "$")	Number of allocation owners of record		
			Total	Small	Large
Surfclam					
114113	Commercial fishing	$11 million in revenues	19	19	0
424460	Fish and Seafood Merchant Wholesalers	100 employees	9	1	8
522110	Commercial Banking	$550 million in assets	8	1	7
522130	Credit Unions	$550 million in assets	6	0	6
523991	Trust, Fiduciary and Custody Activities	$38.5 million in revenues	2	Unknown	Unknown
NA[1]	Small business size standards are not stablished for this sector[2]	Sector 92	5	NA	
Ocean quahog					
114113	Commercial fishing	$11 million in revenues	14	14	0
424460	Fish and Seafood Merchant Wholesalers	100 employees	6	2	4
522110	Commercial Banking	$550 million in assets	1	0	1
522130	Credit Unions	$550 million in assets	1	0	1
523991	Trust, Fiduciary and Custody Activities	$38.5 million in revenues	2	Unknown	Unknown
NA[1]	Small business size standards are not stablished for this sector[2]	Sector 92	0	NA	

[1] Not Applicable. [2] The Public Administration sector consists of establishments of federal, state, and local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area.

As previously described, there are no reporting or record-keeping requirements associated with the four proposed actions discussed in this document. This action does not contain a collection-of-information requirement for purposes of the PRA (see section 8.8). The actions relate solely to maximum harvest levels for surfclam and ocean quahog in federal waters and the Maine (mahogany) ocean quahog zone, and to whether the minimum size limit for surfclam should continue to be suspended. Proposed and final rules on these actions will be published in the FR.

8.10.3 Analysis of Economic Impacts

A description of the clam fisheries is presented in section 6.0 of this document and in section 2.3.3 of Amendment 13 (MAFMC 2003). Additional information on "Community Profiles for the Northeast U.S. Fisheries" can be found at:

http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

A full description of the alternatives analyzed in this section and the catch limits derivation process is presented in sections 4.0 and 5.0. A brief description of each alternative is presented below for reference purposes.

The ITQ system implemented for these fisheries allows industry participants to benefit from a high degree of flexibility in their fishing operations, as government regulation is basically reduced to quota holders not exceeding their individual allowances. Industry members are free to trade quota amongst themselves as best suits their individual business needs. Costs to society are reduced and efficiency greatly enhanced when the use of effort limitation and closed seasons to limit total annual harvests can be avoided. These tools often have the effect of overcapitalizing fisheries with unneeded vessels that are obliged to operate inefficiently, reducing socioeconomic benefits derived from these fishery resources.

The impacts of adjustments to the federal quota for surfclam and ocean quahog on small businesses are straightforward to assess. Both the surfclam and ocean quahog fisheries are single-species fisheries, with low rates of bycatch of other commercially-valuable or protected species. Vessels are able to effectively target each species individually, without needing permits for other species, or operating under closed seasons or minimum sizes.

The direct impacts of any quota adjustment for surfclam and non-Maine ocean quahog would be felt by the 64 and 33 entities currently holding surfclam and ocean quahog ITQ allocations, respectively. The actual number of individuals or businesses holding these registered allocations may be smaller, since each holder may often maintain multiple allocations for accounting, or liability purposes.

The Maine ocean quahog fishery is currently prosecuted by a total of 6 small vessels. The annual quota pertains to the Maine ocean quahog zone, and is not allocated to individual allocation holders as is the case outside of Maine. Once the Maine quota is harvested, fishing may only proceed if quota is leased from the ITQ fishery outside of Maine.

The industrial fisheries for surfclam and ocean quahog use hydraulic dredges to harvest clams. Traditionally, surfclams' dominant use has been in the "strip market" to produce fried clams. In recent years, however, they have increasingly been used in chopped or ground form for other products, such as high-quality soups and chowders. Traditionally, the dominant use of ocean quahog has been in soups, chowders, and white sauces. Their small meat has a sharper taste and darker color than surfclam, which has not permitted their use in strip products or the higher-quality chowders. With their lower ex-vessel price when compared to surfclam, ocean quahog have historically been a bulk, low-priced food item, they are also considered as a substitute for surfclam. As in other fisheries such as Atlantic mackerel, the industrial ocean quahog fishery has only been viable when large quantities could be harvested quickly and efficiently.

The small-scale fishery for ocean quahog in Maine provides is a contrast to the industrial fishery that occurs off the coast of the mid-Atlantic. Locally these small ocean quahog off the coast of Maine are known as “mahogany quahog.” Small vessels in the 35-45 foot range actively target

smaller ocean quahog for the fresh, half-shell market in Maine. Most of the catch is trucked directly out of Maine and typically sold at an ex-vessel price higher than those from other clams.

In this section, the effects of actions were analyzed by employing quantitative approaches to the extent possible. Where quantitative data were not available, qualitative analyses were conducted. In the current analysis, effects associated with the proposed management measures should be evaluated by looking at the impact the proposed measures on revenues.

As indicated in section 6.4.5 (Brief Description of Landings, Quota Utilization, and Market Trends), for most years from 1990 (when the ITQ system was implemented) to 2003, the surfclam harvest levels were near or at full quota level. However, for the last decade or so (2008-2019), surfclam production has been below the quota. Surfclam landings in 2019, reached a record low at 1.9 million bushels, the lowest landings level since the ITQ system was implemented which also corresponds to the lowest quota utilization (percentage of quota landed). Overall, in the last few years (2008-2019), a downward trend in landings of surfclam is observed. In addition, industry members have indicated that if the impacts on the industry due to the Covid-19 pandemic on demand and sales continues, it may result in additional lower/reduced landings. Trips harvesting surfclam have increased in length as catch rates have declined steadily in the traditionally-fished areas off the Mid-Atlantic coast. There was light fishing on Georges Bank in years 2009-2011 under an exempted fishing permit and LPUE in that area was substantially higher (5-7 times higher) than in other traditional fishing grounds. However, in recent years, the LPUE from Georges Bank has decerased considerably (344 bu/hr in 2009 to 75 bu/hr in 2019). LPUE in Geroges Bank and Souther New England have generally been high.

The federal ocean quahog quota had remained constant at 4.50 million bushels from 1999 through 2003. It was first increased in 2004 from 4.50 million bushels to 5.00 million bushels. Then in 2005, it was increased again from 5.00 million bushels to 5.33 million bushels. The market was unable to absorb either of the two increases in quota, and the 2005 increase occurred precisely at the point in time when the glut of clam meats on the market was at its peak. The quota has been set at 5.33 million bushels since 2005. As indicated in section 6.4.5 (Brief Description of Landings, Quota Utilization, and Market Trends), in the last fifteen years or so (2004-2019), a downward trend in landings of ocean quahog is observed (Table 2). Ocean quahog landings in 2019, were 2.5 million bushels, which also corresponds to one of the lowest quota utilizations (percentage of quota landed) since the ITQ system was implemented in 1990. Ocean quahog landings have not reached the quota of 5.3 million bushels since it was set in 2005.

The State of Maine has requested continuance of the 100,000 bushel quota of mahogany quahog for the Maine. The Maine ocean quahog fleet landed 100 percent of the quota five years in five years from 2003-2019. On average, 68 percent of the quota has been landed for the 2003-2019. However, in the last 5 years (2015-2019), only 34 percent of the quota has been landed. Maine ocean quahog landings were 23,339 Maine bushels in 2019.

If industry conditions are favorable (e.g., market forces, weather conditions), the surfclam, ocean quahog, and Maine ocean quahog fleets are expected to land surfclam and ocean quahog at levels similar to those in 2019. There is no indication that the market environment for commercially caught surfclam and ocean quahog will change considerably in years 2021-2026 compared to

current conditions. However, if market conditions change and demand increases to higher levels than during 2019, it is possible that more clams will be landed, resulting in higher revenues for the industry.

Expected 2021 Impacts

Under the proposed action for surfclam, non-Maine ocean quahog, and Maine ocean quahog, the quotas would stay the same as those currently implemented for 2019-2020 (surfclam = 3.40 million bushels; non-Maine ocean quahog = 5.64 million bushels; Maine ocean quahog = 100,000 bushels; Table 12). Revenues in 2021 are uncertain and will depend not only on the quota, but also on market forces, weather conditions, and availability of high-density beds for these species. In general, maintaining the 2019-2020 quotas into 2021 is expected to have no impacts for both the small and large allocation owners identified above due to the expectation that recent industry revenue levels will be maintained. As indicated above and in sections 6.4.5 and 7.1.4, the landings for surfclam and ocean quahog have been consistently below the quotas for those species in the last decade or so (2008-2019). There is no indication that the market environment for commercially caught surfclam and ocean quahog will change considerably in years 2021-2026 compared to current conditions. However, if market conditions improve and additional demand is generated, the 2021 quotas could result in slight positive impacts as revenues would increase compared to 2019. The surfclam and ocean quahog landings limits under this alternative are consistent with the ABC recommendations of the SSC and therefore based on the best scientific information available and are intended to prevent overfishing for 2021.

Expected 2022 through 2026 Impacts

The expected impacts of the preferred alternative for surfclam and ocean quahog for each 2022-2026 fishing years are expected to be the same as described under expected 2021 impacts above.

Minimum Shell Length Alternatives

Alternative 1 contains the preferred (*status quo*) minimum shell length measure. Under this alternative, the minimum shell length (i.e., size limit) of 4.75 inches (12.065 cm) on surfclam will be suspended in 2021-2026 resulting in no minimum shell length requirements for the fishery during that time. This measure will be expected to result in neutral social and economic impacts in 2021-2026 when compared to 2019.

8.11 Regulatory Planning and Review/EO 12866

This action is exempt from the procedures of E.O. 12866 because this action contains no implementing regulations.

8.12 Conflict with Other Federal Rules

This action does not duplicate, overlap, or conflict with other Federal rules.

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10.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this document, the Council consulted with NMFS, New England and South Atlantic Fishery Management Councils, Fish and Wildlife Service, and the states of Maine through North Carolina through their membership on the Mid-Atlantic and New England Fishery Management Councils. To ensure compliance with NMFS formatting requirements, the advice of NMFS GARFO personnel was sought.

Copies of this document are available from Dr. Christopher Moore, Executive Director,
Mid-Atlantic Fishery Management Council,
Suite 201, 800 North State Street,
Dover, DE 19901

Appendix A

Essential Fish Habitat descriptions for federally-managed species/life stages in the U.S. Northeast Shelf Ecosystem that are vulnerable to bottom tending fishing gear.

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
American plaice	juvenile	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45-150	Fine grained sediments, sand, or gravel
American plaice	adult	GOM, including estuaries from Passamaquoddy Bay to Saco Bay, ME and from Massachusetts Bay to Cape Cod Bay	45-175	Fine grained sediments, sand, or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25-75	Cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off SNE, these estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10-150	Rocks, pebbles, or gravel
Atl halibut	juvenile	GOM and GB	20-60	Sand, gravel, or clay
Atl halibut	adult	GOM and GB	100-700	Sand, gravel, or clay
Barndoor skate	juvenile/ adult	Eastern GOM, GB, SNE, Mid-Atlantic Bight to Hudson Canyon	l0-750, most < 150	Mud, gravel, and sand
Black sea bass	juvenile	GOM to Cape Hatteras, NC, including estuaries from Buzzards Bay to Long Island Sound, Gardiners Bay, Barnegat Bay to Chesapeake Bay, Tangier/ Pocomoke Sound, and James River	1-38	Rough bottom, shellfish/ eelgrass beds, manmade structures, offshore clam beds, and shell patches
Black sea bass	adult	GOM to Cape Hatteras, NC, including Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay, and James River	20-50	Structured habitats (natural and manmade), sand and shell substrates preferred
Clearnose skate	juvenile/ adult	GOM, along continental shelf to Cape Hatteras, NC, including the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0–500, most < 111	Soft bottom and rocky or gravelly bottom
Haddock	juvenile	GB, GOM, and Mid-Atlantic south to Delaware Bay	35-100	Pebble and gravel
Haddock	adult	GB, eastern side of Nantucket Shoals, and throughout GOM	40-150	Broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Little skate	juvenile/ adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes estuaries from Buzzards Bay south to mainstem Chesapeake Bay	0-137, most 73-91	Sandy or gravelly substrate or mud
Ocean pout	eggs	GOM, GB, SNE, and Mid-Atlantic south to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay and Cape Cod Bay	< 50	Generally sheltered nests in hard bottom in holes or crevices
Ocean pout	juvenile	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, and Cape Cod Bay	< 50	Close proximity to hard bottom nesting areas

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Ocean pout	adult	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, MA Bay, Boston Harbor, and Cape Cod Bay	< 80	Smooth bottom near rocks or algae
Pollock	adult	GOME, GB, SNE, and Mid-Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., MA Bay, Cape Cod Bay, Long Island Sound	15-365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off SNE, and Mid-Atlantic south to Cape Hatteras, including the following estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, and Chesapeake Bay	< 100	Shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras, these estuaries: Passamaquoddy Bay to Saco Bay, Great Bay, MA Bay to Cape Cod Bay; Buzzards Bay to CT River, Hudson River, Raritan Bay, Delaware Bay, and Chesapeake Bay	10-130	In sand and mud, in depressions
Redfish	juvenile	GOM, southern edge of GB	25-400	Silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50-350	Silt, mud, or hard bottom
Rosette skate	juvenile/ adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530, most 74-274	Soft substrate, including sand/mud bottoms
Scup	juvenile/ adult	GOM to Cape Hatteras, NC, including the following estuaries: MA Bay, Cape Cod Bay to Long Island Sound, Gardiners Bay to Delaware inland bays, and Chesapeake Bay	0-38 for juv 2-185 for adult	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Silver hake	juvenile	GOM, GB, continental shelf off SNE, Mid-Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, ME, MA Bay to Cape Cod Bay	20-270	All substrate types
Summer Flounder	juvenile/ adult	GOM to Florida – estuarine and over continental shelf to shelf break	0-250	Demersal/estuarine waters, varied substrates. Mostly inshore in summer and offshore in winter.
Smooth skate	juvenile/ adult	Offshore banks of GOM	31-874, most 110-457	Soft mud (silt and clay), sand, broken shells, gravel, and pebbles
Thorny skate	juvenile/ adult	GOM and GB	18-2000, most 111-366	Sand, gravel, broken shell, pebbles, and soft mud
Tilefish	juvenile/ adult	Outer continental shelf and slope from the U.S./Canadian boundary to the Virginia/North Carolina boundary	100-300	Burrows in clay (some may be semi-hardened into rock)
White hake	juvenile	GOM, southern edge of GB, SNE to Mid-Atlantic and the following estuaries: Passamaquoddy Bay, ME to Great Bay, NH, Massachusetts Bay to Cape Cod Bay	5-225	Seagrass beds, mud, or fine grained sand
Winter flounder	adult	GB, inshore areas of GOM, SNE, Mid-Atlantic south to Delaware Bay and the estuaries from Passamaquoddy Bay, ME to Chincoteague Bay, VA	1-100	Mud, sand, and gravel

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
Winter skate	juvenile/ adult	Cape Cod Bay, GB, SNE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-371, most < 111	Sand and gravel or mud
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50-450 to 1500	Fine grained substrate
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25-300	Fine grained substrate
Yellowtail flounder	adult	GB, GOM, SNE and Mid-Atlantic south to Delaware Bay and these estuaries: Sheepscot River and Casco Bay, ME, MA Bay to Cape Cod Bay	20-50	Sand or sand and mud