EXCESSIVE SHARES AMENDMENT
AMENDMENT 20 TO THE ATLANTIC SURFCLAM AND OCEAN QUAHOG FISHERY MANAGEMENT PLAN

(Includes Environmental Assessment, Regulatory Impact Review, and Initial Regulatory Flexibility Analysis)

August 2022

Mid-Atlantic Fishery Management Council

in cooperation with

the National Marine Fisheries Service (NMFS)

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1.0 EXECUTIVE SUMMARY

This document was prepared by the Mid-Atlantic Fishery Management Council (MAFMC or Council) in consultation with the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS). This document was developed in accordance with all applicable laws and statutes as described in section 8.0.

The purpose of this action (amendment) is to consider a variety of approaches to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog individual transferrable quota (ITQ) privileges. For the surfclam and ocean quahog fisheries, the Council defines an excessive share as an ITQ share accumulation for an individual or business that is above the excessive share percentage cap selected by the Council for surfclam or ocean quahog (based on the affiliation and tracking model selected). In identifying this cap, the Council considered the intent of fisheries management as prescribed through the National Standards of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), including both social and economic concerns. The Council considered economic concerns and selected an excessive shares cap level that is intended to prevent a firm or entity from exerting market power.[1] The Council also considered social concerns for fishing communities - as expressed in MSA National Standard 8 - which includes community participation, and a sense of equity and fairness that may, in part, be grounded in the history of fishery management in this country. This action also includes measures to revise the process for specifying multi-year management measures, to require periodic review of the excessive shares measures, and to allow adjustments to be made under the frameworkable provisions of the Fishery Management Plan (FMP).

In addition to the management measures identified above, this Amendment also revises the management objectives for the Atlantic Surfclam and Ocean Quahog FMP. Revisions are proposed because many managers and stakeholders believe that the current FMP objectives have become outdated and could provide more meaningful guidance if updated. While the current FMP contains only management *objectives*, the proposed revisions contain both broader *goals* as well as objectives. *Goals* are broad, big picture, and aspirational. They can help communicate high-level values and priorities for surfclam and ocean quahog management. *Objectives* are more specific and actionable. They can help describe important steps toward accomplishing goals. *Strategies* refer to specific processes, decision points, and actions the Council and Board may take to achieve objectives and support goals. The current and proposed revisions to FMP objectives do not address specific management strategies, as these are laid out through specific management measures within the FMP. The proposed goals and objectives are described in detail in section 4.0.

1.1 Summary of Alternatives

This document details management alternatives being considered and their expected impacts on several components of the environment. The alternatives are summarized in Boxes ES-1 to ES-4 below, and described in more detail in sections 5.1 to 5.5.

[1] An outcome of obtaining market power could be pricing power in either output (product) or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market.

Box ES-1. Summary of the excessive shares cap alternatives.

Alternatives	Summary of Alternatives
Alternative 1 (No Action/*Status Quo*)	No limit on or definition of an excessive share is included in the FMP.
Alternative 2 (Single Cap – Quota share ownership cap-only, with unlimited possession of cage tags allowed during the fishing year)	A single cap on how much quota share one individual or entity could hold would be established separately for surfclam and ocean quahog. The cap would be based on quota share ownership[2] with unlimited possession of cage tags allowed during the fishing year (Note: all excessive share alternatives are applicable throughout the year). Since the cap is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit.
Sub-Alternative 2.1 (Quota share ownership cap based on highest level in the ownership data, 2016-2017)	The single quota share caps would be based on the highest level of quota share held by an individual or entity reported in the ownership data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. The species-specific cap levels are not the same for each species. If fully consolidated, a 28% cap for surfclam could potentially result in a minimum of four large entities participating in this fishery (i.e., 28%, 28%, 28%, and 16%) and a 22% cap for ocean quahog could potentially result in five large entities participating in this fishery (i.e., 22%, 22%, 22%, 22%, and 12%), regardless of model or affiliation level used.
Sub-Alternative 2.2 (Quota share ownership cap at 49%)	The single cap would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share and transfer/leasing of quota share allocation within the fishing year. A 49% cap could potentially result in a minimum (if fully consolidated) of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%).
Sub-Alternative 2.3 (Quota share ownership cap at 95%)	The single cap would be 95% for surfclam and 95% for ocean quahog. This sub-alternative was recommended for inclusion by the Surfclam and Ocean Quahog Committee. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly/oligopoly). A 95% cap could potentially result in a minimum (if fully consolidated) of two entities participating in the fisheries (i.e., one very large entity and one small entity at 95% and 5%).
Alternative 3 (Cap – applies to possession of both owned quota share and cage tags)	A percent cap based on the possession of both owned quota share and cage tags by an individual or entity would be established separately for surfclam and ocean quahog. Since the cap is based on the possession of allocation that are both owned and transferred, it accounts for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit.
Sub-Alternative 3.1 (Cap based on highest level of tag possession in the ownership and transfer data, 2016-2017)	The caps would be based on the highest level of possession of both owned quota share and cage tags by an individual or entity reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. The species-specific cap levels are not the same for each species. If fully consolidated, this sub-alternative could potentially result in a minimum of two to four large entities participating in the surfclam fishery and three to four large entities participating in the ocean quahog fishery, depending on model or affiliation level used.

[2] **Quota Share Ownership:** The quota share held by an individual or entity. In a manner of speaking, "ownership" usually represents a property right in perpetuity or for as long as the owner wants. However, under MSA there are some important policy issues with respect to duration in the design of limited access privilege programs (i.e., ITQs). The MSA stipulates that limited access privileges may be revoked or limited in accordance with the Act, they do not confer rights of compensation, and they do not create any ownership of a fish before it is harvested [Section 303A(b)] (NMFS 2007).

Box ES-1 (Continued). Summary of the excessive shares cap alternatives.

Alternatives	Summary of Alternatives
Sub-Alternative 3.2 (Cap at 40%)	The cap on the possession of both owned quota share and cage tags by an individual or entity would be 40% for surfclam and 40% for ocean quahog. This is based on the "Rule of Three" notion which allows three big and efficient companies (e.g., with more than 10% market share) to act as a tripod to ensure that neither destructive competition nor collusion prevails. A 40% cap could potentially result in a minimum (if fully consolidated) of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%).
Sub-Alternative 3.3 (Cap at 49%)	The cap on the possession of both owned quota share and cage tags by an individual or entity would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share of the total allowable landings. A 49% cap could potentially result in a minimum (if fully consolidated) of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%).
Alternative 4 (Two-Part Cap Approach – A cap on quota share ownership and a second, higher cap based on possession of cage tags)	A two-part cap approach would be implemented for each surfclam and ocean quahog, with the first part being a cap on quota share ownership, and a second, higher annual allocation cap on the possession of cage tags by an individual or entity. This is based on recommendations for a two-part cap provided in the Compass Lexecon Report. Since the caps are based on quota share ownership and possession of cage tags, it accounts for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit.
Sub-Alternative 4.1 (Two-part cap based on highest level in the ownership and transfer data, 2016-2017)	The two-part cap approach includes one cap on quota share ownership and a second cap on possession of cage tags by an individual or entity based on the highest levels reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. The species-specific cap levels are not the same for each species. If fully consolidated, this sub-alternative could potentially result in a minimum of four large entities participating in the surfclam fishery (i.e., 28%, 28%, 28%, and 16%) and five large entities participating in the ocean quahog fishery (i.e., 22%, 22%, 22%, 22%, and 12%).
Sub-Alternative 4.2 (Two-part cap based on highest level in the ownership and transfer data, 2016-2017, plus 15% added to the maximum levels to allow for additional consolidation)	The two-part cap approach would be based on values reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period (as done under sub-alternative 4.1). However, under this sub-alternative, 15% for additional consolidation is added to the maximum values reported in the ownership and transfer data for the 2016-2017 period. The 15% value was recommended by some industry representatives and is expected to provide flexibility for efficient firms in the surfclam and ocean quahog fisheries to consolidate/grow if market conditions allow. If fully consolidated, this sub-alternative could potentially result in a minimum of three large entities participating in the surfclam fishery (i.e., 43%, 43%, and 14%) and three large entities participating in the ocean quahog fishery (i.e., 37%, 37%, and 26%).
Sub-Alternative 4.3 (Two-part cap – quota share ownership cap at 30% and cap based on possession of cage tags at 60%)	The two-part cap with a quota share ownership cap at 30% and the annual allocation cap (based on possession of cage tags by an individual or entity) at 60%. These values are based on recommendations for a two-part cap provided in the Compass Lexecon Report. If fully consolidated, this sub-alternative could potentially result in a minimum of four large entities participating in the fisheries (i.e., 30%, 30%, 30%, 10%).

Box ES-1 (Continued). Summary of the excessive shares cap alternatives.

Alternatives	Summary of Alternatives
Sub-Alternative 4.4 (**Preferred:** Two-part-cap – Quota share ownership cap and a second, higher annual allocation cap based on possession of cage tags Surfclam: 35/65% Ocean quahog: 40/70%)	For surfclam: a two-part cap with a quota share ownership cap at 35% and a second, higher annual allocation cap (based on possession of cage tags) at 65%. For ocean quahog: a two-part cap with a quota share ownership cap at 40% and an annual allocation cap (based on possession of cage tags by an individual or entity) at 70%. This sub-alternative was recommended by the Surfclam and Ocean Quahog Committee based on their review of public comments. If fully consolidated, this sub-alternative could potentially result in a minimum of three large entities participating in the surfclam fishery (i.e., 35%, 35%, 30%) and three large entities participating in the ocean quahog fishery (i.e., 40%, 40%, 20%). In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership under sub-alternative 4.4 (see definitions and terminology at the end of section 2.0 for more information on these choices. More detailed information on these choices is also found in sections 5 and 7).
Alternative 5 (Quota share ownership cap-only at 40% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota)	The cap would be 40% for surfclam and 40% for ocean quahog with unlimited possession of cage tags allowed during the fishing year plus, Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT (annual catch target) or overall quota level and A shares. B shares are not released until all A shares are used/exhausted. A 40% cap could potentially result in a minimum (if fully consolidated) of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%).
Alternative 6 (Quota share ownership cap-only at 49% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota)	The cap would be 49% for surfclam and 49% for ocean quahog with unlimited possession of cage tags allowed during the fishing year plus, Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT or overall quota level and A shares. B shares are not released until all A shares are used/exhausted. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of quota share allocation within the fishing year. A 49% cap could potentially result in a minimum (if fully consolidated) of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%).

Box ES-2. Summary of the excessive shares review alternatives.

Alternatives	Summary of Alternatives
Alternative 1 (No Action/*Status Quo*)	There would not be a requirement for periodic review of implemented excessive share cap measures.
Alternative 2 (**Preferred:** Require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed)	This alternative would require periodic review of the excessive shares measures that the Council adopts.

Box ES-3. Summary of the framework adjustment process alternatives.

Alternatives	Summary of Alternatives
Alternative 1 (**Preferred:** No Action/*Status Quo*)	No changes to the list of management measures that can be addressed via the framework adjustment process.
Alternative 2 (Add excessive shares cap level to the list of measures to be adjusted via framework)	This alternative would expand the list of framework adjustment measures that have been identified in the FMP. The ITQ program measure that would be added to the list is: 1) excessive shares cap level. This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap), only if the modification would not result in an entity having to divest.

Box ES-4. Summary of the multi-year management measures alternatives.

Alternatives	Summary of Alternatives
Alternative 1 (No Action/*Status Quo*)	No changes to the process to set surfclam and ocean quahog management specifications for up to 3 years.
Alternative 2 (**Preferred:** Specifications to be set for maximum number of years needed to be consistent with the Northeast Regional Coordinating Council (NRCC)-approved stock assessment schedule)	Specifications could be set for the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule. This alternative would provide additional flexibility as specifications could be set to cover the time period until a new surfclam and/or ocean quahog assessment is produced.

1.2 Summary of Impacts

The following section presents a summary of the expected impacts by alternative and cumulatively for management alternatives being considered (Boxes ES-5 to ES-8). The impacts of each alternative, and the criteria used to evaluate them, are described in section 7.0. Impacts (qualitative and/or quantitative) are described in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). In section 7.0, the alternatives are compared to the current condition of the valued ecosystem component (VEC) and also compared to each other. The recent conditions of the VECs include the biological condition of the target stocks, non-target stocks, and protected species over most of the recent five years, as well as characteristics of commercial fisheries and associated human communities over the same time frame. The guidelines used to determine impacts to each VEC are described in section 7.0 (Table 16).

The actions proposed through this 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 proposed action is not expected to result in changes to the manner in which surfclam and ocean quahog fisheries are prosecuted or the industry operates. However, these alternatives may have indirect impacts, particularly for the human communities VEC.

In general terms, measures that would curtail entities from exerting market power and therefore not decreasing competition would have positive socioeconomic impacts. Lastly, measures that would result in community disruptions as a result of additional consolidation (e.g., decrease in the number of independent harvesters, decrease in employment) would have negative socioeconomic impacts.

Excessive consolidation, in an economic context, is the level that moves the competitive condition in the market from one of pure competition to a situation where one or more firms can exert power in the output market (monopoly/oligopoly), or input market (monopsony/oligopsony). In the case of a quota market, it is one where we move from a condition of many buyers and sellers, to one where only a few buyers and sellers exist. In a social context, it is level that results in a less diverse population of participants in the harvesting or processing sectors of the fishery, or that impedes the continued participation of small-vessels, owners/operators, and entry-level participants. Excessive consolidation can occur at the geographic level or at the harvesting and processing sectors of the fisheries. Anticipated impacts are described below.

1.2.1 Excessive Share Alternatives

1.2.1.1 Impacts to Surfclam and Ocean Quahog and Non-Target Species, Physical Habitat, and Protected Resources

Under alternative 1 (no action), no limit on or definition of excessive shares accumulation is included in the FMP. As such, the current management approach to address excessive shares in

the surfclam and ocean quahog ITQ fisheries would continue. Alternatives 2-6[3] are administrative in nature and strictly consider a variety of approaches to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges. None of the alternatives are 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, none of the alternatives evaluated are expected to have impacts (direct or indirect) on the target species and non-target species when compared to current conditions. All alternatives evaluated would have similar impacts on target and non-target species, habitat, and protected resources.

1.2.1.2 Human Communities/Socioeconomic Impacts

Alternative 1

As previously indicated, none of the alternatives are 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.

Under alternative 1 (no action/*status quo*) the current management approach regarding excessive shares (i.e., share accumulation) would continue. Therefore, no specific limit or definition of an excessive share is included in the FMP as required under National Standard 4 of the MSA. The FMP would rely only on federal anti-trust provisions. The Department of Justice (DOJ) has indicated that their Business Practice Process does provide pre-enforcement review and advisory options for certain select transactions. However, the type of scenarios for which the Business Review Process has been used in the past have been for much larger, economically significant deals between companies than is envisioned by the Excessive Shares Amendment. This alternative would leave the FMP out of compliance with the provisions of the MSA, as the Act requires that a process be established to define what constitutes excessive shares (section 4.0), and a means to track and monitor ownership relative to that definition is needed.

Since alternative 1 does not include a limit or definition of excessive shares accumulation, it could potentially lead to one entity holding 100% of the ITQ allocation in the surfclam and/or ocean quahog fisheries. An excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries. Alternative 1 is expected to have socioeconomic impacts ranging from no impact in the short-term to negative in the long-term if consolidation patterns result in decreased competition for these fisheries when compared to current conditions.

[3] Sub-alternative 4.4, under alternative 4 is the Council-preferred alternative. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership. See sections 5 and 7 for additional information.

Alternative 2

Alternative 2 considers a single cap on how much quota one individual or entity could hold. The cap would be based on quota share ownership only with unlimited possession of cage tags allowed during the fishing year. Because alternative 2 is based on ownership-only values, none of the sub-alternatives discussed below account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. Participants in these fisheries have reported that there are various types of transactions involving cage tags that commonly occur, including cage tag transfers, long-term leases (e.g., five years or more), and transfers of cage tags from bank lenders and between both related and unrelated business entities.

Under Sub-alternative 2.1, the single quota share ownership caps would be based on the highest level of quota share held by any individual or entity reported in the ownership data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. The highest level of quota share held by any individual or entity during 2016-2017 was 28% for surfclam and 22% for ocean quahog (regardless of model or affiliation level; Tables 2 and 3). If fully consolidated, a 28% cap for surfclam could potentially result in a minimum of four large entities participating in this fishery (i.e., 28%, 28%, 28%, and 16%; Table 18). If fully consolidated, a 22% cap for ocean quahog could potentially result in a minimum of five large entities participating in this fishery (i.e., 22%, 22%, 22%, 22%, and 12%; Table 18). This implies at least four entities in the surfclam and five entities in the ocean quahog fisheries, which may provide some protection against excessive consolidation and associated market power and social issues. However, as indicated in section 5.0, it is also possible that under all alternatives evaluated, the resulting number of minimum entities could be larger than estimated in this document if full consolidation is not achieved.

If the surfclam and ocean quahog cap levels described above (28% for surfclam and 22% for ocean quahog) had been implemented in 2017, all entities would have fallen at or below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 18). As such, no entity would have been constrained by the cap levels under sub-alternative 2.1 in the surfclam or ocean quahog fisheries. Sub-alternative 2.1 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.

Under Sub-alternative 2.2, the single quota share ownership cap would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of quota share allocation within the fishing year. If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity, at 49%, 49%, and 2%; Table 18).

If the surfclam and ocean quahog cap levels described above (49% for surfclam and 49% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model)

or affiliation level (individual/business, family, or corporate officer; Table 18). As such, no entity would have been constrained by the cap levels under sub-alternative 2.2 in the surfclam or ocean quahog fisheries. Sub-alternative 2.2 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.

Under Sub-alternative 2.3, the single quota share ownership cap would be 95% for surfclam and 95% for ocean quahog. If fully consolidated, a 95% cap could potentially result in a minimum of two entities participating in the fisheries (i.e., one very large entity and one small entity at 95% and 5%; Table 18). This sub-alternative was recommended for inclusion by the Surfclam and Ocean Quahog Committee. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly/oligopoly). It is stated in the Compass Lexecon Report it is possible that under some circumstances an excessive shares cap level of 100% may be appropriate. However, this does not appear to be the case for the surfclam and ocean quahog fisheries ITQ system under current conditions (Mitchell et al. 2011).

Sub-alternative 2.3 could potentially result in quota accumulation levels that are near identical to those under alternative 1 (*status quo* alternative). If one firm or entity controls 95% of the quota, there would be no market for leasing under the current quota levels for these species, as nearly all the quota would be held by a single entity. Sub-alternative 2.3 could potentially allow for share concentration levels similar to those under the current conditions and as such, it could potentially lead to one entity holding 95% of the ITQ allocation in the surfclam and/or ocean quahog fisheries.

If the surfclam and ocean quahog cap levels described above (95% for surfclam and 95% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 18). As such, no entity would have been constrained by the cap levels under sub-alternative 2.3 in the surfclam or ocean quahog fisheries. Sub-alternative 2.3 is expected to have socioeconomic impacts ranging from no impact in the short-term to negative in the long-term if consolidation patterns result in decreased competition for these fisheries when compared to current conditions.

Comparisons Across Sub-Alternatives 2.1 to 2.3

In this section a comparison between sub-alternatives 2.1 through 2.3 is made. This is different from the previous section where each of these sub-alternatives were compared to current conditions.

Sub-alternative 2.1 would have no socioeconomic impacts in the short-term compared to sub-alternatives 2.2 and 2.3 as no entity would be above the caps (if they had been implemented in 2017). However, in the long-term, alternative 2.1 would have slight positive socioeconomic impacts compared to sub-alternative 2.2, as sub-alternative 2.1 has the potential to provide a larger degree of protection against excessive consolidation and associated market power and social issues. Lastly, sub-alternative 2.1 would have positive socio-economic impacts compared to sub-alternative 2.3, as sub-alternative 2.1 has the potential to provide a larger degree of protection

against excessive consolidation (as sub-alternative 2.3 could potentially result in one large entity controlling 95% of the quota allocated for surfclam and/or ocean quahog).

Sub-alternative 2.2 would have less positive socioeconomic impacts in the long-term compared to sub-alternatives 2.1, as sub-alternative 2.2 has the potential to provide a smaller degree of protection against excessive consolidation and associated market power and social issues. Lastly, sub-alternative 2.2 would have positive socioeconomic impacts in the long-term compared to sub-alternative 2.3, as sub-alternative 2.2 has the potential to provide a larger degree of protection against excessive consolidation.

Sub-alternative 2.3 would have negative socioeconomic impacts in the long-term compared to sub-alternatives 2.1 and 2.2, as sub-alternative 2.3 has the potential to provide the smallest degree of protection against excessive consolidation and associated market power and social issues. Sub-alternative 2.3 has the potential to provide even less competition when compared to current conditions.

In general terms, when ranking these three sub-alternatives, sub-alternative 2.1 would result in the most positive impacts, sub-alternative 2.2 would result in the second most positive impacts, and sub-alternative 2.3 would result in negative impacts.

Alternative 3

Alternative 3 considers a cap based on possession of both owned quota share and cage tags. Because alternative 3 is based on possession of both owned quota share and cage tags by an individual or entity, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota. This alternative imposes a combined limit on ownership plus leasing, which would account for transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that occur in these fisheries, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011).

Under Sub-alternative 3.1, the cap would be based on the highest level of possession of both owned quota share and cage tags by any individual or entity reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. Under sub-alternative 3.1, depending on the affiliate level and model selected, the cap for surfclam could be as low as 28% under the net actual percentage model (at the individual/business level) or as high as 49% under the cumulative 100% model (at the corporate officer level; Tables 2 and 19). Based on these cap values, sub-alternative 3.1 could result in a minimum number of large entities (if fully consolidated) in the surfclam fishery ranging from four under the net actual percentage model to two under the cumulative 100% model (Table 19). Under this alternative, depending on the affiliate level and model selected, the cap for ocean quahog could be as low as 29% under the net actual percentage model (at the individual/business level) or as high as 41% under the cumulative 100% model (at the corporate officer level; Table 3 and 19). For ocean quahog, this sub-alternative could result in a minimum number of large entities (if fully consolidated) ranging from four under the net actual percentage model to three under the cumulative 100% model (Table 19).

If the surfclam and ocean quahog cap levels described above had been implemented in 2017, all entities would have fallen below those caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 19). As such, no entity would have been constrained by the cap levels under sub-alternative 3.1 in the surfclam or ocean quahog fisheries. Sub-alternative 3.1 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. However, some of the possible lower cap values under this sub-alternative (e.g., 28% under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values.

Under Sub-alternative 3.2, the cap on the possession of both owned quota share and cage tags by an individual or entity would be 40% for surfclam and 40% for ocean quahog. This is based on the "Rule of Three" notion (Mitchell et al. 2011, Walden 2011). "In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails." And "An excessive-share cap of 40% assures that there would be at least three processors operating at reasonable output levels" (Walden 2011). If fully consolidated, a 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%; Table 19).

If the surfclam and ocean quahog cap levels described above (40% for surfclam and 40% for ocean quahog) had been implemented in 2017, all entities would have fallen below those caps under the net actual percentage model for both surfclam and ocean quahog. However, under the cumulative 100% model, between one (1% of all entities) and three (4% of all entities) surfclam entities and between one (2% of all entities) and four (9% of all entities) ocean quahog entities would have exceeded these caps depending on the affiliation level (Table 19).

In general terms, sub-alternative 3.2 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. However, as indicated above, if sub-alternative 3.2 had been implemented in 2017 (under the cumulative 100% model) up to 4 entities (depending on the affiliate level chosen) would have exceeded a 40% cap. As such, this sub-alternative would have negatively impacted those entities if implemented in 2017. It is important to mention that under this scenario (sub-alternative 3.2 and cumulative 100% model), those impacted entities would have been required to decrease their total allocation (cage tags) held that year, (which could have been accomplished by slightly reducing (between 1% and 7%) the amount of surfclam and/or ocean quahog cage tags possessed that year. This could be accomplished by transferring fewer tags (after the initial allocation of tags) to their possession that year. These 4 impacted entities would have incurred slight negative socioeconomic impacts in the short-term and long-term compared to current conditions.

Under Sub-alternative 3.3, the cap on the possession of both owned quota share and cage tags by an individual or entity would be 49% for surfclam and 49% for ocean quahog. This cap is similar

to the golden tilefish IFQ cap which allows for a 49% maximum share of the total allowable landings. If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%; Table 19).

If the surfclam and ocean quahog cap levels described above (49% for surfclam and 49% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share and cage tags caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 19). As such, no entity would have been constrained by the cap levels under sub-alternative 3.3 in the surfclam or ocean quahog fisheries.

Sub-alternative 3.3 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.

Comparisons Across Sub-Alternatives 3.1 to 3.3

In this section a comparison between sub-alternatives 3.1 through 3.3 is made. This is different from the previous section where each of these sub-alternatives were compared to current conditions.

Sub-alternative 3.1 would have neutral socioeconomic impacts in the short-term compared to sub-alternatives 3.2 and 3.3, as in general terms, no entity would be above the caps (if they had been implemented in 2017; the exception to this generality is listed below). In the long-term, alternative 3.1 would have neutral socioeconomic impacts in the long-term compared to sub-alternative 3.2, because they both could potentially result in a similar minimum number of entities (three or four large entities) participating in these fisheries (Table 19). The exception to this generalization would be sub-alternative 3.1 under the cumulative 100% model which would result in two large entities participating in the surfclam fishery, and as such, provides a lesser degree of protection against excessive consolidation and associated market power and social issues. As such, this results in long-term positive impacts that are smaller in magnitude. Lastly, in general terms, sub-alternative 3.1 would have positive socioeconomic impacts in the long-term compared to sub-alternative 3.3, as sub-alternative 3.1 has the potential to provide a larger degree of protection against excessive consolidation. However, some of the possible lower cap values under sub-alternative 3.1 (e.g., 28% under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values. As such, under these sub-alternative 3.1 specific cases, there would be negative socioeconomic impacts in the long-term compared to sub-alternative 3.2 and 3.3.

Sub-alternative 3.2 would have slight positive socioeconomic impacts in the long-term compared to sub-alternative 3.3, as sub-alternative 3.2 has the potential to provide a larger degree of protection against excessive consolidation and associated market power and social issues. However, as noted above, if sub-alternative 3.2 had been implemented in 2017 (under the cumulative 100% model) up to 4 entities (depending on the affiliate level chosen) would have exceeded the 40% cap. As such, this sub-alternative would have negatively impacted those entities

if implemented in 2017. It is important to mention that under this scenario (sub-alternative 3.2 and cumulative 100% model), those impacted entities would have been required to decrease their total amount of allocation (cage tags) held, which could have been accomplished by slightly reducing (between 1% and 7%) the amount of surfclam and/or ocean quahog cage tags possessed that year. This could be accomplished by transferring fewer tags (after the initial allocation of tags) to their possession that year. These 4 impacted entities would have incurred slight negative socioeconomic impacts in the short-term and long-term compared to current conditions.

Sub-alternative 3.3 would have slightly less positive socioeconomic impacts in the long-term compared to sub-alternatives 3.1 and 3.2, as sub-alternative 3.3 has the potential to provide a smaller degree of protection against excessive consolidation and associated market power and social issues.

In general terms, when ranking these three sub-alternatives, sub-alternative 3.1 would result in the most positive impacts, sub-alternative 3.2 would result in the second most positive impacts, and sub-alternative 3.3 would result in the least positive impacts.

Alternative 4

Alternative 4 considers a two-part cap approach, with the first part being a cap on quota share ownership, and a second cap on the possession of cage tags by an individual or entity. This is based on recommendations for a two-part cap provided in the Compass Lexecon Report. Mitchell et al. (2011) indicated that "the preference for short-term accumulations in the two-part cap limits the share of long-term quota controlled by any single party, which limits the ability to foreclose competitors by withholding quota on a committed multi-season basis." Because alternative 4 is based on a two-part cap approach that limits the possession of both owned quota share and cage tags by an individual or entity, it accounts for transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that occur in these fisheries. This alternative would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011).

Under Sub-alternative 4.1, the two-part cap approach includes one cap on quota share ownership and a second cap on cage tags by an individual or entity based on the highest levels reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period.

Under sub-alternative 4.1, depending on the affiliate level and model selected, the two-part cap for surfclam could be as low as 28% quota share ownership / 28% cage tags under the net actual percentage model (at the individual/business level) or as high as 28% quota share ownership / 49% cage tags under the cumulative 100% model (at the corporate officer level; Tables 2 and 20). Based on these cap values, sub-alternative 4.1 could result in a minimum of four large entities (if fully consolidated) in the surfclam fishery regardless of model or affiliation level used (Table 20). Under this alternative, depending on the affiliate level and model selected, the two-part cap for ocean quahog could be as low as 22% quota share ownership / 29% cage tags under the net actual percentage model (at the individual/business level) or as high as 22% quota share ownership / 41%

cage tags under the cumulative 100% model (at the corporate officer level; Tables 3 and 20). For ocean quahog, this sub-alternative could result in a minimum of five large entities (if fully consolidated) in the ocean quahog fishery regardless of model or affiliation level used (Table 20).

If the surfclam and ocean quahog two-part cap levels described above had been implemented in 2017, all entities would have fallen below those caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the two-part cap levels under sub-alternative 4.1 in the surfclam or ocean quahog fisheries. Sub-alternative 4.1 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 addition, since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota. However, some of the possible lower two-part cap values under this sub-alternative (e.g., 28% quota share ownership / 28% cage tags under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values.

Under Sub-alternative 4.2, the two-part cap approach would be based on values reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period (as done under sub-alternative 4.1). However, under this sub-alternative, 15% is added to the maximum values reported in the ownership and transfer data for 2016-2017 to allow for additional consolidation (Table 20). The 15% value was recommended by some industry representatives and is expected to provide flexibility for efficient firms in the surfclam and ocean quahog fisheries to consolidate further if market conditions allow.

Under sub-alternative 4.2, depending on the affiliate level and model selected, the two-part cap for surfclam could be as low as 43% quota share ownership / 43% cage tags under the net actual percentage model (at the individual/business level) or as high as 43% quota share ownership / 64% cage tags under the cumulative 100% model (at the corporate officer level; Table 20). Based on these cap values, sub-alternative 4.2 could result in a minimum of three large entities (if fully consolidated) in the surfclam fishery regardless of model or affiliation level used (Table 20). Under this alternative, depending on the affiliate level and model selected, the two-part cap for ocean quahog could be as low as 37% quota share ownership / 44% cage tags under the net actual percentage model (at the individual/business level) or as high as 37% quota share ownership / 56% cage tags under the cumulative 100% model (at the corporate officer level; Table 20). For ocean quahog, this sub-alternative could result in a minimum of three large entities (if fully consolidated) in the ocean quahog fishery regardless of model or affiliation level used (Table 20).

If the surfclam and ocean quahog two-part cap levels described above had been implemented in 2017, all entities would have fallen below those caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the two-part cap levels under sub-alternative 4.2 in the surfclam or ocean quahog fisheries. Sub-alternative 4.2 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 addition, since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota.

Under Sub-alternative 4.3, the quota share ownership cap would be 30% and the cage tag cap (based on possession of cage tags by an individual or entity) would be 60%. These values are based on recommendations for a two-part cap provided in the Compass Lexecon Report. If fully consolidated, a 30% quota share ownership cap and a 60% cage tag cap could potentially result in a minimum of four large entities participating in the fisheries (i.e., 30%, 30%, 30%, 10%; Table 20).

If the surfclam and ocean quahog two-part cap levels described above (30/60% for surfclam and 30/60% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the cap levels under sub-alternative 4.3 in the surfclam or ocean quahog fisheries. Sub-alternative 4.3 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 addition, since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota.

Under Council-preferred sub-alternative 4.4, the following cap levels would be implemented - for surfclam: a two-part cap with a quota share ownership cap at 35% and a cage tag cap (based on possession of cage tags by an individual or entity) at 65%; and for ocean quahog: a two-part cap with a quota share ownership cap at 40% and a cage tags cap (based on possession of cage tags) at 70%. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership.[4]

If fully consolidated, this sub-alternative could potentially result in a minimum of three large entities participating in the surfclam fishery (i.e., 35%, 35%, 30%) and three large entities participating in the ocean quahog fishery (i.e., 40%, 40%, 20%; Table 20). The cap values under sub-alternative 4.4 are a slight modification from the values presented under sub-alternative 4.3. The cap values under sub-alternative 4.4 were recommended by most industry members during the public hearing process.

If the surfclam and ocean quahog two-part cap levels described above (35/65% for surfclam and 40/70% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the cap levels under sub-alternative 4.4 in the surfclam or ocean quahog fisheries. Sub-alternative 4.4 is expected to have

[4] See Definitions and Terminology at the end of section 2.0 for more information on these choices. More detailed information on these choices is also found in sections 5 and 7).

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 addition, since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota.

Comparisons Across Sub-Alternatives 4.1 to 4.4

In this section a comparison between sub-alternatives 4.1 through 4.4 (Council-preferred) is made. This is different from the previous section where each of these sub-alternatives were compared to current conditions.

In general terms, sub-alternatives 4.1, 4.2, 4.3, and 4.4 are likely to have neutral socioeconomic impacts (e.g., similar magnitude and direction) in the short-term and long-term, because they all could potentially result in a similar minimum number of entities (three or four large entities) participating in these fisheries (Table 20). Overall, sub-alternatives 4.1, 4.3, and 4.4 would result in neutral socioeconomic impacts in the short-run and marginally positive in the long-run compared to sub-alternative 4.2, as sub-alternative 4.2 provides slightly less protection against competition in the long-run compared to 4.1, 4.3, and 4.4. They all have the potential to provide a relatively similar degree of protection against excessive consolidation and associated market power and social issues. In addition, none of these sub-alternatives would result in any entity being above the caps (if they had been implemented in 2017). However, some of the possible lower two-part cap values under sub-alternative 4.1 (e.g., 28% quota share ownership / 28% cage tags under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower combined cap values. As such, under these sub-alternative 4.1 specific cases, there would be negative socioeconomic impacts in the long-term compared to sub-alternative 4.2, 4.3, and 4.4.

Alternative 5

Alternative 5 considers a cap on quota share ownership-only of 40% for surfclam and 40% for ocean quahog with unlimited possession of cage tags allowed during the fishing year. In addition, this alternative would also establish Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT (annual catch target) or overall quota level and A shares. B shares are not released until all A shares are used/exhausted.

The 40% cap is based on the "Rule of Three" notion (Mitchell et al. 2011, Walden 2011). "In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails." And "An excessive-share cap of 40% assures that there would be at least three processors operating at reasonable output levels" (Walden 2011).

If fully consolidated, a 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%; Table 21). If the surfclam and ocean quahog cap levels described above (40% for surfclam and 40% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 21). As such, no entity would have been constrained by the cap levels under alternative 5 in the surfclam or ocean quahog fisheries.

Since this alternative would implement a two quota-tier system (Quota A shares and Quota B shares), it would align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). This could result in more activity in the leasing market and prevention of exclusionary practices. While this may in turn benefit quota holders that have not been able to use (due to market demand) or lease (due to a depressed leasing market) their quota allocations in recent years, it may adversely impact current entities that lease quota if quota lease prices increase. In addition, current participants may be compelled to lease additional allocations (before Quota B shares are released) from other industry participants in order to maintain their previous levels of harvest. Processors will likely have to pay more in financial costs (due to additional leasing and/or purchase costs), which will decrease net revenue due to the loss in monopsony power which will be transferred to fully participating ITQ owners.

However, it is possible that there could be quota allocation holders that may not want to lease their quota allocations out thus impeding the release of Quota B shares. If this were to occur, landings could be affected and additional flexibility for increasing harvests if there is a surge in demand for surfclam or quahog midway through the fishing year could not be met. One way to address this issue could be to release Quota B shares when 90 or 95% of Quota A shares have been used. Alternative 5 is expected to result in mixed socioeconomic impacts when compared to current conditions. In terms of providing protection against excessive consolidation and associated market power issues, alternative 5 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. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done.

During the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative socioeconomic impacts that would disrupt current business practices. For example, it was indicated that:

- Establishing a Quota A and Quota B shares system would send a market signal indicating that the surfclam and ocean quahog quotas (TACs) have been reduced, because the amount of quota released under Quota A shares is lower than the overall TACs that have been implemented in recent years. This in turn could result in big companies that purchase clam

products (e.g., Progresso, Campbell Soup Company, etc.) to switch to lower quality foreign imports
- The Quota A and Quota B shares system would disrupt banking/financial arrangement because ITQ shares have been used as collateral in securing long-term loans
- Aligning the quota with market demand may not necessarily result in equilibrium because long-term contracts arrangements (leasing arrangements) exist in these fisheries; and breaking existing long-term contracts could result in lawsuits
- Aligning the quota with market demand would give market power to the industry members that have not been able to lease/use their ITQ shares in recent years
- This alternative could result in closing of processing plants
- There is the potential for someone to lease large quantities of A shares and not use them to develop market power

Alternative 6

Alternative 6 considers a cap on quota share ownership-only of 49% for surfclam and 49% for ocean quahog with unlimited possession of cage tags allowed during the fishing year. In addition, this alternative would also establish Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT (or overall quota level) and A shares. B shares are not released until all A shares are used/exhausted. This cap is similar to the tilefish golden IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of allocation within the fishing year. The only difference between alternatives 5 and 6 are the cap levels on quota share ownership; all other aspects of the alternatives are identical.

If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%). If the surfclam and ocean quahog cap levels described above (49% for surfclam and 49% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer). As such, no entity would have been constrained by the cap levels under alternative 6 in the surfclam or ocean quahog fisheries. Alternative 6 is expected to result in mixed socioeconomic impacts when compared to current conditions. In terms of providing protection against excessive consolidation and associated market power issues, alternative 6 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. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done. In addition, as indicated above, during the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative

socioeconomic impacts that would disrupt current business practices. These potential impacts listed under alternative 5 also apply here.

Comparisons Across All Excessive Shares Cap Alternatives

In general terms, alternatives 5 and 6 would result in the largest positive impacts as a result of protection against market power or other anticompetitive behaviors and associated social issues, alternatives 3 and 4 would result in the second highest positive impacts, alternative 2 would result in the third highest positive impacts, and alternative 1 would result in the least positive impacts. More detail of the expected impacts is provided below.

However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses under alternatives 5 and 6 compared to all other excessive shares cap alternatives. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done.

Alternative 1 (No Action)

As previously indicated, under alternative 1 (no action) no limit on or definition of excessive shares accumulation is included in the FMP. This alterative is expected to result in impacts ranging from no impacts in the short-term to negative impacts in the long-term when compared to alternatives 2 through alternative 6, because alternative 1 provides no protection against excessive consolidation and associated market power and social issues. The exception would be when alternative 1 is compared to sub-alternative 2.3, as sub-alternative 2.3 could potentially allow for share concentration levels similar to those under alternative 1, and it could potentially lead to one entity holding 95% of the ITQ allocation in the surfclam and/or ocean quahog fisheries. Compared to sub-alternative 2.3, alternative 1 is likely to have a similar magnitude of socioeconomic impacts (i.e., neutral).[5]

None of the excessive share alternatives discussed in this document are expected to impact 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. The proposed action is not expected to result in changes to the manner in which surfclam and ocean quahog fisheries are prosecuted. However, these alternatives may have indirect impacts, particularly for the human communities VEC.

[5] Since sub-alternative 2.3 is likely to result in impacts similar to those under alternative 1, all other comparisons involving alternative 2 exclude sub-alternative 2.3, with the understanding that when comparisons are made with sub-alternative 2.3 exclusively, impacts would be similar to those under alternative 1 (no action/*status quo*).

Alternative 2

Alternative 2 would implement a single cap based on quota share ownership-only with unlimited possession of cage tags allowed during the fishing year. Because alternative 2 is based on ownership-only values, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This alternative would limit the exercise of market power through capping ownership levels for surfclam and ocean quahog, but it does not address the creation or exercise of market power through contractual control of quota.

Alternative 2 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because it provides protection against excessive consolidation and associated market issues. Compared to alternative 3 and alternative 4, alternative 2 is expected to have similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude as alternative 2 does not address the creation or exercise of market power through contractual control of quota (as done under alternatives 3 and 4).

Lastly, in terms of providing protection against excessive consolidation and associated market power issues, alternative 2 is expected to result in similar directional impacts compared to alternatives 5 and 6 (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude because alternatives 5 and 6 not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices.

Alternative 3

Alternative 3 would implement a cap based on quota share ownership plus possession of cage tags. Because alternative 3 is based on combined possession of both owned quota share and cage tags, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota. This alternative imposes a combined limit on quota share ownership plus cage tag leasing, which would account for transactions and complex contracting and business practices that occur in these fisheries.

Alternative 3 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because it provides protection against excessive consolidation and associated market issues. Compared to alternative 2, alternative 3 is expected to have similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) but slightly larger in magnitude as alternative 2 does not address the creation or exercise of market power through contractual control of quota (as done under alternative 3). Compared to alternative 4, alternative 3 is likely to have a similar magnitude of socioeconomic impacts (i.e., no impacts in the short-term to positive impacts in the long-term) as they both would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota.

Lastly, in terms of providing protection against excessive consolidation and associated market power issues, alternative 3 is expected to result in similar directional impacts compared to alternatives 5 and 6 (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude because alternatives 5 and 6 not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices.

Alternative 4

Alternative 4 would implement a two-part cap approach, with the first part being a cap on quota share ownership, and a second cap on the possession of cage tags by an individual or entity.[6] Because alternative 4 is based on a two-part cap approach that limits the combined possession of both owned quota share and cage tags by an individual or entity, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota. This alternative imposes a limit on the possession of cage tags, which would account for transactions and complex contracting and business practices that occur in these fisheries.

Alternative 4 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because it provides protection against excessive consolidation and associated market issues. Compared to alternative 2, alternative 4 is expected to have similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) but slightly larger in magnitude as alternative 2 does not address the creation or exercise of market power through contractual control of quota (as done under alternative 4). Compared to alternative 3, alternative 4 is likely to have a similar magnitude of socioeconomic impacts (i.e., no impacts in the short-term to positive impacts in the long-term) as they both would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota.

Lastly, in terms of providing protection against excessive consolidation and associated market power issues, alternative 4 is expected to result in similar directional impacts compared to alternatives 5 and 6 (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude because alternatives 5 and 6 not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices.

Alternative 5

Alternative 5 would implement a cap on quota share ownership-only with unlimited possession of cage tags allowed during the fishing year. In addition, this alternative would also establish Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares

[6] Sub-alternative 4.4, under alternative 4 is the Council-preferred alternative. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership. See sections 5 and 7 for additional information.

is the difference between the ACT (or overall quota level) and A shares. B shares are not released until all A shares are used/exhausted.

Alternative 5 is expected to result in mixed socioeconomic impacts when compared to current conditions. In terms of providing protection against excessive consolidation and associated market power issues, alternative 5 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because alternative 5 not only addresses the exercise of market power through capping ownership levels for surfclam and ocean quahog but also aligns supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices. For these same reasons, alternative 5 is expected to result in similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) compared to alternatives 2, 3, and 4, but likely larger in magnitude. Lastly, compared to alternative 6, alternative 5 is expected to result in similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) as they both not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses under alternative 5 compared to excessive shares cap alternatives 1-4. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done. In addition, as indicated above, during the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative socioeconomic impacts that would disrupt current business practices. These potential impacts were listed above under alternative 5.

Furthermore, current participants may be compelled to lease additional allocations (before Quota B shares are released) from other industry participants in order to maintain their previous levels of harvest. Processors will likely have to pay more in financial costs (due to additional leasing and/or purchase costs), which will decrease net revenue due to the loss in monopsony power which will be transferred to fully participating ITQ owners.

Alternative 6

The expected impacts under alternative 6 are similar to those described under alternative 5 above.

1.2.2 Excessive Shares Review Alternatives

1.2.2.1 Impacts to Surfclam and Ocean Quahog and Non-Target Species, Physical Habitat, and Protected Resources

Under alternative 1 (no action), there would not be a requirement for periodic review of implemented excessive shares measures. Alternative 2, would require periodic review of the excessive shares measures that the Council adopts. None of the alternatives are expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. These alternatives are administrative in nature and would therefore have no impacts on the target species and non-target species when compared to current conditions. All alternatives evaluated would have similar impacts on target and non-target species, habitat, and protected resources.

1.2.2.2 Human Communities/Socioeconomic Impacts

These alternatives are administrative in nature and are not expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels (and expected ex-vessel revenues), fishery distribution, or fishing methods and practices. However, conditions in the fisheries have changed over time since the FMP was implemented and the ITQ system became effective, and those conditions are likely change in the future. Therefore, an excessive shares measure established at an appropriate level now could over time become inefficiently high (offering too little constraint on the exercise of market power) or low (offering too much constraint on efficient competitive activity in the industry). Thus, not having a mechanism in place to review the effectiveness of implemented excessive shares measures (alternative 1) could result in socioeconomic impacts that range from no impacts (if implemented excessive shares measures is appropriate through time) to slight negative (if implemented excessive shares measures is not appropriate through time) when compared to current conditions.

Alternative 2, is also administrative in nature and would require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed. As with the no action alternative above, alternative 2 is not expected to have impacts on the quantity of surfclam or ocean quahog landings, including revenues. However, this alternative requires periodic review of excessive shares measures that the Council adopts. This alternative would implement a periodic review of regulations to protect against market power or other anticompetitive behavior in these fisheries in a timely manner. Alternative 2 is expected to result in socioeconomic impacts ranging from no impacts to slight positive when compared to current conditions. Compared to alternative 1, alternative 2 is expected to have slight positive socioeconomic impacts as it allows for a proactive review of excessive management shares management measure(s) implemented by the Council. While it is not possible to anticipate the potential management cost associated with alternative 2, they are likely to be higher than those associated with alternative 1. Costs will depend on the complexity and scope of the review process.

1.2.3 Framework Adjustment Process Alternatives

1.2.3.1 Impacts to Surfclam and Ocean Quahog and Non-Target Species, Physical Habitat, and Protected Resources

Under Council-preferred alternative 1 (no action), there would not be changes to the list of management measures that can be addressed via the framework adjustment process. The Council selected alternative 1 as the preferred alternative because they were concerned that allowing changes to the numeric cap value of a specific "excessive shares cap level" may be better addressed under an amendment process and not a frameworkable action (as it would be allowed under alternative 2). Some Council members and stakeholders indicated that changes to "cap values" under a frameworkable action may not allow for sufficient stakeholder input.

Alternative 2 would expand the list of framework adjustment measures that have been identified in the FMP. The ITQ program measure that would be added to the list is: 1) excessive shares cap level. None of the alternatives are expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. These alternatives are administrative in nature and would therefore have no impacts on the target species and non-target species when compared to current conditions. All alternatives evaluated would have similar impacts on target and non-target species, habitat, and protected resources.

1.2.3.2 Human Communities/Socioeconomic Impacts

These alternatives are administrative in nature and are expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels (and expected ex-vessel revenues), fishery distribution, or fishing methods and practices. Alternative 1 (no action) would not allow the excessive shares cap level to be modified via the framework adjustment process. The Council would still have the prerogative to review any adopted excessive shares measures and make modifications to any implemented excessive cap level through an amendment if it becomes inefficiently high or low through time as fisheries conditions change. However, making modifications to existing regulations using an amendment process requires more work and time compared to a framework process. Not having the flexibility to make minor modifications to the excessive shares cap level (no action alternative) could result in socioeconomic impacts ranging from no impact to slightly negative when compared to current conditions. Compared to alternative 2, alternative 1 is expected to have slight negative socioeconomic impacts.

Alternative 2 is administrative in nature and strictly considers the expansion of the list of framework adjustment measures that have been identified in the FMP. This alternative would add adjustments to the excessive shares cap level to the list of frameworkable actions in the FMP. The proposed alternative would provide flexibility to address potential modifications to any implemented excessive cap level (i.e., cap value only and not underlaying cap system) if it becomes inefficiently high or low through time as fisheries conditions change. Alternative 2 is expected to result in socioeconomic impacts that range from no impact to slight positive when compared to current conditions. Compared to alternative 1, alternative 2 is expected to have slight positive

socioeconomic impacts because this alternative provides the flexibility to adjust any implemented excessive cap level if it becomes inefficiently or low through time as fisheries conditions change, and this has the potential to reduce needed staff time and management cost.

1.2.4 Multi-Year Management Measures Alternatives

1.2.4.1 Impacts to Surfclam and Ocean Quahog and Non-Target Species, Physical Habitat, and Protected Resources

Under alternative 1 (no action), there would be no changes to the process to set surfclam and ocean quahog management specifications for up to 3 years. Under alternative 2, specifications could be set for up to the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule. None of the alternatives are expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. These alternatives are administrative in nature and would therefore have no impacts on the target species and non-target species when compared to current conditions. All alternatives evaluated would have similar impacts on target and non-target species, habitat, and protected resources. Although there are no impacts on the VECs, alternative 2 would provide for substantial administrative efficiencies by reducing the need to create and implement multiple specification documents to set management measures for the fisheries between stock assessments (i.e., efficient use of Council and NOAA staff time supporting the management process; thus, reducing staff time and management cost).

1.2.4.2 Human Communities/Socioeconomic Impacts

These alternatives are administrative in nature and would therefore have no impacts on human communities (i.e., socioeconomic impacts).

Box ES-5. Summary of the expected impacts of excessive shares cap alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect. The ranking within alternative suites is in terms of providing protection against excessive consolidation and associated market power and social issues (1 most to 3 least).

Alternative	Brief Description	Target/Non-Target Species; Habitat; Protected Resources	Human Communities	Rank
Alternative 1 (No-Action/*Status Quo*)	No limit on or definition of an excessive share is included in the FMP	No Impact	No impact in the short-term to - in the long-term if consolidation patterns result in decreased competition. Could result in further decrease or the elimination of independent harvesters (harvesters not vertically integrated) participating in these fisheries	NA (Not Applicable)
Alternative 2 Sub-alternative 2.1	Single Cap - Quota share ownership cap based on highest level in the ownership data, 2016-2017	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Cap based on ownership-only	1
Alternative 2 Sub-alternative 2.2	Single Cap - Quota share ownership cap at 49%	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Cap based on ownership-only	2
Alternative 2 Sub-alternative 2.3	Single Cap - Quota share ownership cap at 95%	No Impact	Similar impacts as under alternative 1 (above)	3
Alternative 3 Sub-alternative 3.1	Quota Share and Cage Tag Cap - based on highest level of tag possession in the ownership and transfer data, 2016-2017	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota. However, some of the possible lower cap values under this sub-alternative (e.g., 28% under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values	1
Alternative 3 Sub-alternative 3.2	Quota Share and Cage Tag Cap at 40%	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota. If implemented in 2017, this sub-alternative would had constrained 4 entities, incurring slight negative socioeconomic impacts in the short-term and long-term	2

Box ES-5 (Continued). Summary of the expected impacts of excessive shares cap alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect. The ranking within alternative suites is in terms of providing protection against excessive consolidation and associated market power and social issues (1 most to 3 least).

Alternative	Brief Description	Target/Non-Target Species; Habitat; Protected Resources	Human Communities	Rank
Alternative 3 Sub-alternative 3.3	Quota Share and Cage Tag Cap at 49%	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota	3
Alternative 4 Sub-alternative 4.1	Two-part cap (one cap on quota share ownership and a second, higher cap based on possession of cage tags) - based on highest level in the ownership and transfer data, 2016-2017	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota. However, some of the possible lower two-part cap values under this sub-alternative (e.g., 28% quota share ownership / 28% cage tags under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values	1
Alternative 4 Sub-alternative 4.2	Two-part cap – Same as 4.1 + 15%	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota	2
Alternative 4 Sub-alternative 4.3	Two-part cap – quota share ownership cap at 30% and possession of cage tag cap at 60%	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota	1
Alternative 4 Sub-alternative 4.4 Preferred	Two-part cap – Quota share ownership cap and a second, higher possession of cage tag cap Surfclam: 35/65% Ocean quahog: 40/70%	No Impact	No impact in the short-term to + in the long-term. Provides protection against excessive consolidation and associated market power and social issues. Limits the exercise of market power that could be derived through both quota share ownership and contractual control of quota	1

Box ES-5 (Continued). Summary of the expected impacts of excessive shares cap alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect. The ranking within alternative suites is in terms of providing protection against excessive consolidation and associated market power and social issues (1 most to 3 least).

Alternative	Brief Description	Target/Non-Target Species; Habitat; Protected Resources	Human Communities	Rank
Alternative 5	Quota share ownership cap-only at 40% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota	No Impact	Alternative 5 is expected to result in mixed socioeconomic impacts. In terms of providing protection against excessive consolidation and associated market power issues, alternative 5 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term. Aligns supply in the fisheries with market demand. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done. This alternative would result in processors paying more in financial cost (due to additional leasing and/or purchase costs), thus resulting in negative socioeconomic impacts in the short-term and long-term. This alternative will decrease net revenue due to the loss in monopsony power which will be transferred to fully participating ITQ owners. During the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative socioeconomic impacts that would disrupt current business practices.	NA
Alternative 6	Quota share ownership cap-only at 49% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota	No Impact	Same as those under alternative 5 above	NA

Box ES-6. Summary of the expected impacts of excessive shares review alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect.

Alternative	Target and Non-Target Species	Habitat	Protected Resources	Human Communities
Alternative 1 (No-Action/*Status Quo*)	No Impact	No Impact	No Impact	No impact to slight -
Alternative 2 Preferred	No Impact	No Impact	No Impact	No Impact to slight +

Box ES-7. Summary of the expected impacts of framework adjustment process alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect.

Alternative	Target and Non-Target Species	Habitat	Protected Resources	Human Communities
Alternative 1 (Preferred: No-Action/*Status Quo*)	No Impact	No Impact	No Impact	No Impact to slight -
Alternative 2	No Impact	No Impact	No Impact	No Impact to slight +

Box ES-8. Summary of the expected impacts of multi-year management alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect.

Alternative	Target and Non-Target Species	Habitat	Protected Resources	Human Communities
Alternative 1 (No-Action/*Status Quo*)	No Impact	No Impact	No Impact	No Impact
Alternative 2 Preferred	No Impact	No Impact	No Impact	No Impact

2.0 LIST OF FREQUENTLY USED ACRONYMS, CONVERSIONS, AND DEFINITIONS

Frequently Used Acronyms

ABC	Acceptable Biological Catch
ACT	Annual Catch Target
APSD	Analysis Program and Support Division
bu	Bushels
CEA	Cumulative Effects Assessment
CEO	Chief Executive Officer
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIE	Center for Independent Experts
cm	Centimeter (0.393 inches)
CSP	Catch Share Programs
DOJ	U.S. Department of Justice
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EMUs	Ecological Marine Units
EO	Executive Order
ESA	Endangered Species Act
F	Fishing Mortality Rate
FMAT	Fishery Management Action Team
FMP	Fishery Management Plan
FR	Federal Register
ft^3	Cubic feet (7.48052 gallons; 0.03703 cubic yards)
FONSI	Finding of No Significant Impact
GAO	Government Accountability Office
GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GOM	Gulf of Maine
GSC	Great South Channel
HMA	Habitat Management Area
IBQ	Individual Bluefin Quota
IFQ	Individual Fishing Quota
IRFA	Initial Regulatory Flexibility Analysis
ITQ	Individual Transferrable Quota
km	Kilometer (0.621 miles)
LAPP	Limited Access Privilege Program
LPUE	Landings Per Unit of Effort
m	Meter (3.280 feet)
MAFMC	Mid-Atlantic Fishery Management Council (Council)
MEO	Market Equilibrium Output
MFP	Multi-factor Productivity
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAICS	North American Industry Classification System Codes
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NRCC	Northeast Regional Coordinating Council

NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS	National Standard
OHA2	Omnibus Essential Fish Habitat Amendment 2 (NEFMC)
OFL	Overfishing Limit
OY	Optimal Yield
P, Pr, RFF	Past, Present, Reasonably Foreseeable Future
PBR	Potential Biological Removal
PRA	Paperwork Reduction Act
PSP	Paralytic Shellfish Poisoning
R	Recruitment
R_0	Recruitment in an Unfished Stock
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBA	Small Business Administration
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
SASI	Swept Area Seabed Impact
U.S.	United States
VEC	Valued Ecosystem Component
VMS	Vessel Monitoring Systems
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 ft^3); 1 surfclam bushel = 17 lb meats (1.88 ft^3) ; 1 ocean quahog bushel = 10 lb meats (1.88 ft^3). Number of bushels divided by 32 = number of cage tags.

Definitions and Terminology

Annual Allocation/Cage Tags: For each species (surfclam and ocean quahog), the initial allocation for the next fishing year is calculated by multiplying the quota share percentage held by each ITQ quota share holder by the quota specified by the Regional Administrator. The total number of bushels of annual allocation is divided by 32 to determine the appropriate number of cage tags to be issued to quota share allocation holders.

Atlantic Surfclam and Ocean Quahog Information Collection Program Data: Requirements became effective on January 1, 2016. The Atlantic Surfclam and Ocean Quahog Information Collection Program was implemented at the request of the Council to provide additional information about individual, family, and business/corporate ownership and other forms of control of allocations. This information allows managers to better characterize current levels of ownership concentration to assist in defining an excessive share, and to monitor and enforce any future restriction on share levels in the fisheries.

Excessive Consolidation: In an economic context, it is the level that moves the competitive condition in the market from one of pure competition to a situation where one or more firms can exert power in the output market (monopoly/oligopoly), or input market (monopsony/oligopsony). In the case of a quota market, it is one where we move from a condition of many buyers and sellers, to one where only a few buyers and sellers exist. In a social context, it is level that results in a less diverse population of participants in the harvesting or processing sectors of the fishery, or that impedes the continued participation of small-vessels, owners/operators, and entry-level participants. Excessive consolidation can occur at the geographic level or at the harvesting and processing sectors of the fisheries.

Excessive Share: For the surfclam and ocean quahog fisheries, the Council defines an excessive share as an ITQ share accumulation for an individual or business that is above the excessive share percentage cap selected by the Council for surfclam or ocean quahog (based on the affiliation and tracking model selected). In identifying this cap, the Council considered the intent of fisheries management as prescribed through the National Standards of the Magnuson-Stevens

Fishery Conservation and Management Act (MSA), including both social and economic concerns. The Council considered economic concerns and selected an excessive shares cap level that is intended to prevent a firm or entity from exerting market power. The Council also considered social concerns for fishing communities - as expressed in MSA National Standard 8 - which includes community participation, and a sense of equity and fairness that may, in part, be grounded in the history of fishery management in this country.

ITQ (Individual Transferrable Quota): A type of output control (also called a LAPP) in which harvesting privileges are allocated to individual fishermen.

ITQ Quota Share: Percent of the total quota held by each ITQ quota share holder before it is converted into cage tags that are allocated for use by the fishery. The percent quota share held by an ITQ quota share holder is multiplied by the current fishery quota that is implemented, then divided by 32 to determine the number of cage tags received.

Monopoly: A market situation where there is only one seller of a product, and where there are no close substitutes of the product.

Monopsony: A market situation where there is only buyer of a product.

National Standards (NS): The National Standards are principles that must be followed in any federal fishery management plan to ensure sustainable and responsible fishery management. As mandated by the Magnuson-Stevens Fishery Conservation and Management Act, NMFS has developed guidelines for each National Standard. When reviewing fishery management plans, plan amendments, and regulations, the Secretary of Commerce must ensure that they are consistent with the National Standards. See section 8.0 of this document for more detail on the 10 National Standards under the MSA. See https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines for additional information.

National Standard 4 - Allocations: Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (a) fair and equitable to all such fishermen; (b) reasonably calculated to promote conservation; and (c) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privilege. See https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines for additional information.

National Standard 5 - Efficiency: Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose. See https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines for additional information.

National Standard 8 - Communities: Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities. See https://www.fisheries.noaa.gov/national/laws-and-policies/national-standard-guidelines for additional information.

Oligopoly: A market situation with relatively few sellers who are mutually interdependent in their marketing activities (e.g., some food processing industries are oligopolistic).

Oligopsony: A market situation where there are a few buyers of a product and each of the few buyers exerts a disproportionate influence on the market.

Ownership Data: This term is used interchangeably with the "Atlantic Surfclam and Ocean Quahog Information Collection Program Data (see above)."

Quota Share Ownership: The quota share held by an individual or entity. In a manner of speaking, "ownership" usually represents a property right in perpetuity or for as long as the owner wants. However, under MSA there are some important policy issues with respect to duration in the design of limited access privilege programs (i.e., ITQs). The MSA stipulates that limited access privileges may be revoked or limited in accordance with the MSA, they do not confer rights of compensation, and they do not create any ownership of a fish before it is harvested [Section 303A(b)] (NMFS 2007).

Transferability Rules: These allow ITQ allocation holders to buy, sell, give away (permanent transfer ITQ quota share) or lease their privileges (temporarily transfer cage tags). When quota is leased out, cage tags are temporarily transferred from the ITQ quota allocation holder (lessor) to the person leasing cage tags (lessee).

Two-Tier Quota: Quota system that aligns supply in the fisheries with market demand (described under excessive share alternatives 5 and 6). Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the annual catch target (ACT) or overall quota level and A shares. B shares are not released until all A shares are used/exhausted.

Models for determination of quota share ownership (or share totals for quota share ownership) and cage tag possession (ownership plus leasing of cage tags):

Ownership Percentage Models: There are models for determination of quota share ownership (or share totals for quota share ownership) and cage tag possession (ownership plus leasing of cage tags)

Net Actual Percentage Model - Each owner's share in a business is used to determine the percentage of business ownership in that business's owned quota share or in the percentage of issued tags. Example: John owns 50% of a company, he is assumed to hold 50% of the quota share held by the company. When calculated, the credits and debits are tabulated throughout the year at the time of each transaction, and the maximum net balance that a person attained in a year is used for this determination.

Cumulative 100% Model - Any ownership interest in a quota share or ownership of cage tags by an individual or business is calculated as 100% of that quota share. Example: John owns 50% of a company, but in this scenario, he is assumed to hold all (100%) of the quota share held by that company when determining overall quota holdings. When calculated, the credits/inputs (initial cage tag allocation and tag transfers in) accrue over the year for each person; debits/outputs (sale of quota share and tag transfers out) are not included in this calculation; and the total accrued credits for a year are used in the determination.

Affiliation Levels:

Individual/Business Level - Smallest unit at the individual level or business (if an individual owner cannot be identified); ***Family Level*** **(individual / business level + family level)*** - Includes any family associations that are not already accounted at the individual business level; and, ***Corporate Officer Level*** **(individual / business level + family level + corporate officer level)** - Includes association through corporate officer's that are not accounted for in the other levels.

*On the "Surfclam/Ocean Quahog Individual Transferable Quota (ITQ) Ownership Form," *Immediate Family* is defined as: Father, mother, husband, wife, son, daughter, brother, sister, grandfather, grandmother, grandson, granddaughter, father-in-law, or mother-in-law (https://www.fisheries.noaa.gov/new-england-mid-atlantic/resources-fishing/greater-atlantic-region-forms-and-applications-summary).

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4.0 INTRODUCTION AND BACKGROUND

This document was developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA)[7] 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 FMP. The management regime and objectives of the fisheries are detailed in the FMP, including any subsequent amendments which are available at: http://www.mafmc.org, and briefly described below.

4.1 PURPOSE AND NEED OF THE ACTION

The primary purpose of this action is to implement measures under the MSA to ensure that no individual, corporation, or other entity acquires an excessive share of the Atlantic surfclam and ocean quahog ITQ privileges. National Standard 4 states that "... *If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges*." In 1990 Amendment 8 implemented the ITQ program for the Atlantic surfclam and ocean quahog fisheries. Amendment 8 did not include a specific cap or measures that limited the maximum amount of shares that could be owned by an individual, corporation, or entity (MAFMC 1988).

In the 27 years since the implementation of the ITQ program, the number of firms or entities participating in these two fisheries have declined and action is needed to avoid excessive share concentration by defining what constitutes an excessive share for the Atlantic surfclam and ocean quahog ITQ privileges to ensure the FMP is in compliance with the MSA. In 2016, a new data collection protocol was implemented by NMFS that allows managers to better assess quota ownership and concentration levels.[8]

For the surfclam and ocean quahog fisheries, the Council defines an excessive share as an ITQ share accumulation for an individual or business that is above the excessive share percentage cap selected by the Council for surfclam or ocean quahog (based on the affiliation and tracking model selected). In identifying this cap, the Council considered the intent of fisheries management as prescribed through the National Standards of the MSA, including both social and economic concerns. The Council considered economic concerns and selected an excessive shares cap level that is intended to prevent a firm or entity from exerting market power. The Council also considered social concerns for fishing communities - as expressed in MSA National Standard 8 -

[7] Magnuson-Stevens Fishery Conservation and Management Act, portions retained plus revisions made by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 (MSRA), and available at: http://www.nmfs.noaa.gov/sfa/magact/MSA_Amended_2007%20.pdf

[8] Atlantic Surfclam and Ocean Quahog Information Collection Program Requirements became effective on January 1, 2016. The Atlantic Surfclam and Ocean Quahog Information Collection Program was implemented at the request of the Council to provide additional information about individual, family, and business/corporate ownership and other forms of control of allocations. This information allows managers to better characterize current levels of ownership concentration to assist in defining an excessive share, and to monitor and enforce any future restriction on share levels in the fisheries.

which includes community participation, and a sense of equity and fairness that may, in part, be grounded in the history of fishery management in this country.

In an economic context, excessive consolidation is a level that moves the competitive condition in the market from one of pure competition to a situation where one or more firms can exert power in the output market (monopoly/oligopsony), or input market (monopsony/oligopsony). In the case of a quota market, it is one where we move from a condition of many buyers and sellers, to one where only a few buyers and sellers exist. In a social context, it is level that results in a less diverse population of participants in the harvesting or processing sectors of the fishery, or that impedes the continued participation of small-vessels, owners/operators, and entry-level participants. Excessive consolidation can occur at the geographic level or at the harvesting and processing sectors of the fisheries.

In addition, this action includes measures to revise the process for specifying multi-year management measures. This action would allow multi-year management measures to be set for a maximum number of years needed to be consistent with the approved NRCC stock assessment schedule. This approach is expected to provide for better consistency and administrative efficiency. This action would also require periodic review of the excessive share cap level to be made and allow adjustments to the frameworkable provisions in the FMP.

Lastly, this action includes revisions to the goals and objectives of the FMP. The Council is undergoing a process to review and possibly revise goals and objectives for all its managed fisheries and FMPs. The Council initiated this process in support of its 2014-2018 Strategic Plan and 2017 Implementation Plan (http://www.mafmc.org/strategic-plan). This initiative allows the Council to revisit and "refresh" FMP goals and objectives to ensure that they are consistent with today's fisheries and management issues. The issue was included in the Excessive Shares Amendment to take advantage of efficiencies in timing and public review.

There are currently 16 catch shares programs in the U.S. 13 of these programs have specific excessive shares cap level requirements. Two other programs do not specify an excessive shares cap level requirement, but they have other measures in place to avoid excessive accumulation of shares or allocation. The surfclam and ocean quahog fisheries are the only federally-managed fisheries in the country that do not have measures to limit share accumulation as of the preparation of this document.[9] See Appendix A for additional information on excessive share caps for catch shares programs in the U.S.

4.2 FMP OBJECTIVES

4.2.1 Current FMP Objectives

The original FMP objectives were adopted through Amendment 8 to the Atlantic Surfclam and Ocean Quahog FMP, which implemented the ITQ system in 1990 (MAFMC 1988). The FMP objectives have remained unchanged since that time. This amendment proposes modification of objectives. The current FMP objectives are as follows:

[9] Section 303A of the MSA has additional requirements for catch share programs adopted after January 12, 2007.

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.
2. Simplify to the maximum extent the regulatory requirements of clam and quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of clam and quahog management.
3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of clam and quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.
4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

After the ITQ system for these clam fisheries was implemented in 1990, the Regional Administrator granted experimental status to the small-scale eastern Maine ocean quahog fishery that was operating in the EEZ. Amendment 10 fully integrated the Maine fishery into the Atlantic Surfclam and Ocean Quahog FMP. The specified objectives under Amendment 10 (MAFMC 1998a) did not change the overall FMP objectives adopted under Amendment 8. Specified FMP objectives for the eastern Maine ocean quahog fishery under Amendment 10 are as follows:

1. Protect the public health and safety by the continuation of the State of Maine's PSP (Paralytic Shellfish Poisoning) monitoring program for ocean quahogs harvested from the historical eastern Maine fishery.
2. Conserve the historical eastern Maine portion of the ocean quahog resource.
3. Provide a framework that will allow the continuation of the eastern Maine artisanal fishery for ocean quahogs.
4. Provide a mechanism and process by which industry participants can work cooperatively with Federal and State management agencies to determine the future of the historical eastern Maine fishery.

4.2.2 Proposed Revisions to FMP Objectives

As indicated in section 4.1, the Council is undergoing a process to review and revise goals and objectives for all their managed fisheries and FMPs. The Council initiated this process in support of the 2014-2018 Strategic Plan and 2017 Implementation Plan. This initiative allows the Council to revisit and "refresh" FMP goals and objectives to ensure that they are consistent with today's fisheries and management issues.

The Council is proposing revisions to the current FMP objectives for surfclam and ocean quahog through this amendment. While the current FMP contains only management *objectives*, the proposed revisions contain both broader *goals* as well as *objectives*. The current and proposed revisions to FMP objectives do not address specific management strategies, as these are laid out through specific management measures within the FMP.

In the spring of 2017, the Council contracted the Fisheries Leadership & Sustainability Forum (Fisheries Forum)[10] to solicit feedback from the Council's Surfclam and Ocean Quahog Committee members, the Surfclam and Ocean Quahog Advisory Panel members, and state agency representatives from states engaged in the fisheries, on the structure, content, and use of FMP goals and objectives. Fisheries Forum staff also reviewed feedback on goals and objectives obtained from the amendment scoping process. Fisheries Forum distilled this feedback into a synthesis of ideas, perspectives, and themes of discussion, that were integrated with subsequent recommendations from the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment Fishery Management Action Team (FMAT).[11]

In October 2017, the Council held a workshop on Atlantic Surfclam and Ocean Quahog FMP goals and objectives, where the Council reviewed the Fisheries Forum synthesis and provided additional feedback but did not make any changes to the goals and objectives developed by the FMAT. The Council approved the goals and objectives for public hearings and directed the FMAT to make the Fisheries Forum synthesis document available to the public during the public hearing process to solicit additional feedback. The proposed FMP Goals and Objectives for surfclam and ocean quahog were approved by the Council in December 2019, and include five goal statements, each with one or more associated management objectives. **The Council adopted goals and objectives are as follows:**

Goal 1: Ensure the biological sustainability of the surfclam and ocean quahog stocks to maintain sustainable fisheries.

Goal 2: Maintain a simple and efficient management regime.

Objective 2.1: Promote compatible regulations between state and federal entities.
Objective 2.2: Promote coordination with the New England Fishery Management Council.
Objective 2.3: Promote a regulatory framework that minimizes government and industry costs associated with administering and complying with regulatory requirements.

Goal 3: Manage for stability in the fisheries.

Objective 3.1: Provide a regulatory framework that supports long-term stability for surfclam and ocean quahog fisheries and fishing communities.

Goal 4: Provide a management regime that is flexible and adaptive to changes in the fisheries and the ecosystem.

Objective 4.1: Advocate for the fisheries in ocean planning and ocean use discussions.
Objective 4.2: Maintain the ability to respond to short and long-term changes in the environment.

Goal 5: Support science, monitoring, and data collection that enhance effective management of the resources.

Objective 5.1: Continue to promote opportunities for government and industry collaboration on research.

[10] http://www.fisheriesforum.org/
[11] This synthesis document is available at: https://www.mafmc.org/s/SCOQ-Goals-and-Objectives-Synthesis-FINAL.pdf

4.3 MANAGEMENT UNIT

The management unit is all Atlantic surfclam (*Spisula solidissima*) and ocean quahog (*Arctica islandica*) in the Atlantic EEZ. Amendment 10 also established a management regime specific to the eastern Maine fishery for a zone north of 43° 50' north latitude (i.e., Maine mahogany quahog fishery).

4.4 AMENDMENTS AND OTHER FMP MODIFICATIONS

The Council has been involved in surfclam and ocean quahog management since its first Council meeting (September 1976). An overview of the original FMP, amendments, and framework actions that have affected management of surfclam and ocean quahog are summarized in Table 1. These actions are available at: http://www.mafmc.org/.

Table 1. Summary of the history of the Atlantic Surfclam and Ocean Quahog FMP.

Year Approved	Document	Management Action(s)
1977	Original FMP	- Established management of surfclam and ocean quahog fisheries through September 1979 - Established quarterly quotas for surfclam - Established annual quotas for ocean quahog - Established effort limitation, permit, and logbook provisions - Instituted a moratorium on entry into the surfclam fishery for one year to allow time for the development of an alternative limited entry system such as a "stock certificate" program
1979	Amendment 1	- Extended management authority through December 31, 1979 - Maintained the moratorium
1979	Amendment 2	- Extended the FMP through the end of 1981 - Divided the surfclam portion of the management unit into the New England and Mid-Atlantic Area - Introduced a "bad weather make up day" - Maintained the moratorium in the Mid-Atlantic Area
1981	Amendment 3	- Extended the FMP indefinitely - Imposed a 5.5" surfclam minimum size limit in the Mid-Atlantic Area - Expanded the surfclam fishing week in the Mid-Atlantic Area to Sunday - Thursday from Monday – Thursday - Established a framework basis for quota setting - Proposed a permit limitation system to replace the moratorium which was disapproved by NMFS - NMFS extended the moratorium
1984	Amendment 4 (Not approved)	- Amendment 4 was implemented on an emergency basis for 180 days beginning 1 July 1984 - Provided that any unharvested portion of a bimonthly allocation be added to the immediately following bimonthly allocation rather than being prorated over all remaining bimonthly periods and that trip and weekly limits be by vessel classes based on relative fishing power - NMFS subsequently determined that the document was not structurally complete for review
1985	Amendment 5	- Allowed for revision of the surfclam minimum size limit provision - Extended the size limit throughout the entire fishery - Instituted a requirement that cages be tagged

Table 1 (Continued). Summary of the history of the Atlantic Surfclam and Ocean Quahog FMP.

Year Approved	Document	Management Action(s)
1986	Amendment 6	- Divided the New England Area into the Nantucket Shoals and Georges Bank Areas, the dividing line being 69° W Longitude - Combined the provisions of Amendment 4 with the Mid-Atlantic Council's Amendment 6 into one document - Replaced the bimonthly quotas with quarterly quotas - Eliminate the weekly landing limits for the Nantucket Shoals Area - Clarified the quota adjustment provisions for the Nantucket Shoals and Georges Bank Areas - Established one landing per trip provision
1987	Amendment 7	- Changed the quota distribution on Georges Bank to equal quarterly quotas - Revised the roll over provisions
1990	Amendment 8	- Replaced the regulated fishing time system in the surfclam and ocean quahog fisheries with an ITQ system
1996	Amendment 9	- Revised the overfishing definitions for surfclam and ocean quahog in response to a scientific review by NMFS
1998	Amendment 10	- Provided management measures for the small artisanal fishery for ocean quahog (mahogany clams) off the northeast coast of Maine
1998	Amendment 11	- Achieved consistency among Mid-Atlantic and New England FMPs on vessel replacement and upgrade provisions, permit history transfer and splitting and renewal regulations for fishing vessels issued Northeast Limited Access Federal Fishery permits
1999	Amendment 12	- Brought the FMP into compliance with the new and revised National Standards and other requirements of the 1996 Sustainable Fisheries Act - Established a framework adjustment process - Implemented an Operator Permit requirement for fishermen that did not already have them for other fisheries - The Regional Administrator partially approved Amendment 12 with the exceptions of the proposed surfclam overfishing definition and the fishing gear impacts to (Essential Fish Habitat) EFH section
2003	Amendment 13	- Addressed various disapproved sections of Amendment 12
2007	Amendment 14	- Standardized bycatch reporting methodology
2007	Framework 1	- Addressed issues related to Vessel Monitoring Systems (VMS) and enforcement
2011	Amendment 16	- Established Annual Catch Limits (ACLs) and Accountability Measures (AMs)
2015	Amendment 15	- Standardized Bycatch Reporting Methodology
2015	Amendment 18	- Eliminated the requirement for vessel owners to submit "did not fish" reports for the months or weeks when their vessel was not fishing - Removed some of the restrictions for upgrading vessels listed on Federal fishing permits
2016	Amendment 17	- Established a cost recovery program for the ITQ program, as required by the MSA - Removed the optimum yield ranges from the management plan and changed how biological reference points are incorporated into the FMP
2017	Amendment 19	- Implemented management measures to prevent the development of new, and the expansion of existing, commercial fisheries on certain forage species in the Mid-Atlantic

Table 1 (Continued). Summary of the history of the Atlantic Surfclam and Ocean Quahog FMP.

Year Approved	Document	Management Action(s)
2018	Framework 2	- Established a process for setting constant multi-year Acceptable Biological Catch (ABCs) limits for Council-managed fisheries - Clarified that the Atlantic Bluefish, Tilefish, and Atlantic Mackerel, Squid, and Butterfish FMPs will now automatically incorporate the best available scientific information in calculating ABCs (as all other Mid-Atlantic management plans do) rather than requiring a separate management action to adopt them - Clarified the process for setting ABCs for each of the four types of ABC control rules

4.5 HISTORY OF THE ACTION

Court Case

The final rule implementing the surfclam and ocean quahog ITQ program became effective on September 30, 1990. Almost immediately, lawsuits were filed by groups of harvesters and processors challenging various features of the program, most notably the formula for allocating fishing privileges among fishery participants. The case *Sea Watch International v. Mosbacher* [Secretary of Commerce], 762 F. Supp. 370 (D.D.C. 1991; available at: https://law.justia.com/cases/federal/district-courts/FSupp/762/370/1619911/), illustrates the major legal challenges to the initial allocation. In general, the plaintiffs in the case argued that the initial allocation was not fair and equitable and therefore in violation of National Standard 4 of the MSA and,

"The plaintiffs claimed that the initial allocation allowed particular individuals, corporations, or other entities to acquire an excessive share of fishing privileges. Plaintiffs alleged that the allocation would concentrate 40 percent of the annual catch quota for the ocean quahog fishery in two fishermen, and that fragmentation of the remaining shares would result in further consolidation as holders of small shares sold their interests, creating an impermissible restraint on competition." [12]

The court noted the 40% number "does give pause" but found the MSA has no definition of the term "excessive shares" and that the judgment of NMFS of what is excessive "deserves weight." Further, the court stated, "Even if the raw number measured a true economic market - which is by no means clear - a judgment of undue concentration could not be based on the mere existence of such a share possessed by the two largest participants." With that, the court dismissed the plaintiffs' argument.

[12] Northern Economics, Inc. 2019. Review of the Atlantic Surfclam and Ocean Quahog Individual Transferable Quota Program. Prepared for Mid-Atlantic Fishery Management Council.

Tracking Shares Concentration Following ITQ Plan Implementation

During the development of Amendment 8, the Council discussed in detail the requirements under National Standard 4.[13] During those discussions, the Council was advised by NOAA General Counsel (GC) that in order to address part (C) of National Standard 4, there was no legal requirement to put a specific cap (numeric cap) into Amendment 8. GC indicated that a cap is simply a tool to address the National Standard 4 part (C) and that if the Council could come up with an equally effective mechanism to meet that requirement, they could use that mechanism. The Council's intent under Amendment 8 was to have NMFS annually monitor the concentration of ITQ (as ITQ owners have to apply to NMFS to transfer ITQ) and if it seemed that excessive consolidation was occurring (i.e., an excessive share was being amassed), they would advise the U.S. Department of Justice (DOJ), which would then determine if antitrust laws were being violated (Joel McDonald Personal Communication, July 16, 2017).

As such, during the early period of the implementation of Amendment 8, the Council believed that NMFS could effectively monitor the concentration of ITQ ownership.

While the court case upheld Amendment 8 in 1991 - one year after the ITQ was implemented - it became clear over time to NMFS that this administrative process did not work. The creation of new business entities (e.g., LLC's, etc.) with ITQ ownership, and the lack of a regulatory mechanism (by NMFS) to identify corporate ownership or business partnerships across individuals or entities involved hampered the ability to determine whether there was a concentration of quota ownership, and whether competitive conditions were being eroded in the quota share market over time.[14] Therefore, the review of industry concentration could not be conducted.

NMFS recognized they could no longer conclude that the ITQ program was carried out in such a manner to prevent someone from acquiring an excessive share of the fishing privileges and advised the Council of these concerns. GC indicated that the Council needed to put at least two regulatory components in place: one to identify the individuals behind the corporate entities listed as the owner of the ITQ, and an ownership cap or other control mechanism to keep individuals from acquiring the level of ITQ ownership that the Council deems to be "excessive." [15] It is important to recognize that MSA did not address this issue by incorporating definitions from antitrust law or simply relying on enforcement of antitrust law. Rather, MSA used the term "excessive share" - a term left undefined in the statute. As noted in a 2007 NMFS guidance document on limited access privilege programs, while share levels exceeding antitrust standards would clearly represent an

[13] National Standard 4 states that '*... If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges*.'

[14] For example, one person could form a couple of corporations and hold and acquire ITQ and it could not be determined whether or not this represented an excessive share since the ITQs would appear to be owned by legally separate entities.

[15] As noted in the *Sea Watch International* case, even though the initial ITQ program relied upon existing antitrust law to define excessive shares, NMFS and the Council retained the ability to modify the FMP and associated regulations, "without the permission of the ITQ holders." 762 F. Supp. at 380.

excessive share, factors such as other MSA requirements and National Standards can lead a Council to a more restrictive share limit than antitrust law may otherwise permit. [16]

During the development of alternatives for the Excessive Shares Amendment, staff at the Council and GARFO (including GC) spoke with the Antitrust Division of the DOJ about the role that they might play in the monitoring of excessive shares in the surfclam and ocean quahog fisheries. The DOJ indicated that their Business Review Process does provide pre-enforcement review and advisory options for certain select transactions. However, the type of scenarios for which the Business Review Process[17] has been used in the past have been for much larger, economically significant deals between companies than is envisioned by the Excessive Shares Amendment, making it an unfeasible vehicle for ongoing monitoring of quota share ownership.[18] For additional steps taken by the Council and NMFS regarding the excessive shares issue, see "Chronology of this Action" section below.

Chronology of this Action

This section presents in chronological order major steps taken by the Council and/or NMFS in addressing the excessive shares issue.

1990

- Surfclam and ocean quahog ITQ program is implemented.

2002

- Discussion of excessive shares in these fisheries began as early as December 2002 with a Government Accountability Office (GAO) report "Individual Fishing Quotas: Better Information Could Improve Program Management." [19] The December 2002 GAO report stated:
  - Surfclam and ocean quahog quota consolidation is greater than NMFS data indicate. According to NMFS officials and others knowledgeable about the fishery, the quota holder of record (i.e., the individual or entity under whose name is listed as the quota owner) is often not the entity that controls the use of the quota. Some families hold quota under the names of more than one family member; some parent corporations hold quota under the names of one or more subsidiaries; some entities hold quota under the name of one or more incorporated vessels; and some financial institutions serve as transfer agents and hold quota on behalf of others or in lieu of collateral for loans.
  - The governing rules of each program may have affected the extent of consolidation and the information collected. However, without clear and accurate data on quota

[16] NOAA Technical Memorandum NMFS-F/SPO-86, The Design and Use of Limited Access Privilege Programs, at 53-60 (NMFS 2007).
[17] For a detailed description of the Business Review process of the DOJ see:
[18] Sarah Heil, letter to Dr. Chis Moore, June 1, 2018.
[19] The U.S. Government Accountability Office (GAO; https://www.gao.gov/) is an independent, nonpartisan agency that works for Congress. Often called the "congressional watchdog," GAO examines how taxpayer dollars are spent and provides Congress and federal agencies with objective, reliable information to help the government save money and work more efficiently.

holders and fishery-specific limits on quota holdings, it is difficult to determine whether any quota holdings in a particular fishery would be viewed as excessive, as prohibited by the MSA.

- NMFS does not gather sufficient information or periodically analyze the data it does collect on surfclam/ocean quahog and wreckfish quota holders to determine (1) who actually controls the use of the quota and (2) whether the holder is a foreign individual or entity. Furthermore, while each fishery is different, the regional councils have not defined the amount of quota that constitutes an excessive share in the surfclam/ocean quahog and wreckfish IFQ programs. Different program objectives and the political, economic, and social characteristics of each fishery make it difficult to define excessive share. However, without the information on who controls quota and defined limits on quota accumulation, NMFS cannot determine whether eligibility requirements are being met or raise questions as to whether any quota holdings are excessive.

2003

- In 2003, NMFS responded to several members of Congress about the GAO report. NMFS indicated that it would urge the Council to develop an FMP amendment that limits the shares that an individual may hold.

2004

- A 2004 NMFS report (by Doug Christel) was written in response to the GAO report, and highlighted some of the additional information needs in these fisheries. "This report concludes that the degree of concentration in the ITQ program described by the GAO is due to the amount of information available. Current data collection by NMFS is insufficient to assess [quota share] ownership concentration to the extent necessary to monitor excessive shares within the ITQ program. This is because limited information is collected on corporate structure or related business entities." In addition, "This report recommends that further information be collected regarding allocation ownership within the ITQ program."

2004 - 2011

- During this time period, several FMAT meetings were held to discuss this issue. Periodically, the Council was updated on FMAT activities. But during this time period, no decisions were made to move this action forward to the Council.

2011

- Compass Lexecon Report concluded that, "The evidence we analyzed does not support a conclusion that market power is currently being exercised through withholding of quota in the SCOQ [surfclam and ocean quahog fisheries]." However, the report indicates that, "We do not analyze whether market power is exercised through the withholding of harvesting or processing, or through exclusionary conduct other than conduct involving quota ownership."
- The Compass Lexecon Report was reviewed by the CIE. [Summary of Findings by the Center for Independent Experts Regarding Setting Excessive Share Limits for ITQ Fisheries. Northeast Fisheries Science Center Reference Document 11-22]. The review noted that:

    - Measures of industrial concentration in the surfclam and ocean quahog fisheries (the Herfindahl-Hirschman index or HHI) suggests that marketing power may exist

in these fisheries, particularly in its harvesting and processing sectors, but less so in quota holdings. These concentration measures are only indicative of the possibility of market power. They do not establish that it actually exists.
- Implementation of the method proposed by the Technical Group requires at least the following data: quota [share] ownership and control, processing volumes and capacity, size of the relevant market.
- The method proposed by the Technical Group is based on the HHI, which means that evaluation of potential market power is consistent with what is done in other industries. However, in order to apply the method, more data are needed along with a better understanding of the industry.
- The Technical Group should have paid more attention to the monopsony problem, which is the ability of processors to exert market power on the harvesting sector. This may be of greater concern than the monopoly problem.

2012

- The February 2012 Surfclam and Ocean Quahog Committee meeting discussed next steps for the then-numbered Amendment 15.
- At that meeting, GC Joel MacDonald advised that an information collection program could be implemented by NMFS without a Council FMP amendment under authority granted in Section 402(a) of the MSA.
- The Committee voted to split Amendment 15 into several parts: 1) move forward with cost recovery, EFH, and the ocean quahog biological reference point update in Amendment 15, 2) request that NMFS develop an information collection program, and 3) move development of an excessive shares cap to the next amendment.

2013

- A "Data Collection Protocol" was developed for the Council to consider that would provide the data needed to understand quota share ownership and control of the quota allocations in the surfclam and ocean quahog fisheries.
- The Council approved the "Data Collection Protocol."

2015

- The data collection protocol was implemented.

2016

- Ownership data collection began in 2016.

2017

- An FMAT was reformed to work on the Excessive Shares Amendment.

2018

- June 2018: Range of alternatives developed and presented to the Surfclam and Ocean Quahog Committee and Council.

2019

- March 2019: The Surfclam and Ocean Quahog Advisory Panel and Committee provided feedback on the public hearing document.
- April 2019: The Council reviewed public hearing document and instructed FMAT to make some modifications to the document and bring it back to the Committee for review.

2020

- June 2019: The Surfclam and Ocean Quahog Committee reviewed the Public Hearing Document for the Excessive Shares Amendment to ensure the document is complete for Council review and approval.

- June 2019: The Council reviewed and approved the Draft Public Hearing Document for the SCOQ Excessive Shares Amendment.
- August-September 2019: The Council held a series of public hearings on Excessive Shares Amendment.
- September 2019: The Surfclam and Ocean Quahog Advisory Panel and Committee reviewed and provided input on the public hearing comments from the Excessive Shares Amendment.
- December 2019: The Surfclam and Ocean Quahog Committee reviewed the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment prior to formal action by the Council. The Committee also recommended preferred alternatives for the Council to consider.
- December 2019: The Council selected preferred alternatives and approved the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment for submission to the Secretary of Commerce.

5.0 MANAGEMENT ALTERNATIVES

This amendment considers a range of alternatives to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges. This amendment also considers requirements for the periodic review of an implemented excessive shares cap level. Lastly, this action considers revisions to the process for specifying multi-year management measures, and future framework actions to make modifications to the excessive shares cap level.

In recognition of the diversity of potential solutions to these goals, a range of possible options for management measures ("alternatives") were developed for consideration. This approach complies with the statutory requirements of the NEPA to include a "range of alternatives" when evaluating the environmental impacts of federal actions. Section 5.1 describes the excessive shares cap alternatives, section 5.2 describes the periodic excessive shares review alternatives, section 5.3 describes the framework alternatives, and section 5.4 describes multi-year management measures alternatives. In addition, several alternatives were considered by the Council and rejected for further analysis. These "considered but rejected" alternatives are described in section 5.5. The complete analyses of the biological, economic, and social impacts of the alternatives is presented in section 7.0 of this document.

Comprehensive descriptions of the current regulations for surfclam and ocean quahog as detailed in the Code of Federal Regulations (CFR) are available, respectively, at:
https://www.fisheries.noaa.gov/species/atlantic-surfclam and
https://www.fisheries.noaa.gov/species/ocean-quahog.

5.1 Excessive Shares Cap Alternatives

The Council is required to define measurable criteria for what constitutes an excessive share for the surfclam and ocean quahog ITQ privileges, to ensure the FMP is compliant with the MSA (see section 4.1 for additional information).

None of the alternatives under consideration would result in the need for an individual, entity, or corporation to divest. Therefore, this document does not describe specific divestment mechanisms. When implemented, NMFS would disapprove transactions that would be in excess of the Council's selected excessive shares cap level.

The Compass Lexecon Report and associated Center for Independent Experts (CIE) review indicated a need for reliable information regarding both quota share ownership, and control of the quota by tracking the transfer and possession of cage tags in the surfclam and ocean quahog fisheries, to implement an excessive shares definition. Information showing detailed quota transfers and ownership relationships among final quota holders is important in assessing quota share ownership and control (Mitchell et al., 2011, Walden 2011).

Participants in these fisheries have reported that there are various types of transactions involving cage tags that commonly occur, including cage tag transfers, long-term leases (e.g., five years or more), and transfers of cage tags from bank lenders and between both related and unrelated business entities. As such, it is important to consider these complex contracting and business practices that occur in these fisheries. Furthermore, as indicated in the Compass Lexecon Report:

> *"The need for harvesters to hold quota at the time of harvesting raises further complications: some harvesters own or contract for their own quota, whereas in other cases processors obtain quota and transfer it without charge to their harvesters (which may be [either] affiliated or independent). When the processor owns quota or contracts for quota on behalf of a harvester, the transfer data will show the quota has been transferred to a harvester, but will not show whether the processor retains control of the quota in such transactions ("control" in this context means the power to decide whether the quota will be used to harvest clams). A complete understanding of the actual ownership and control of quota requires analysis of the contracts under which quota were transferred to the final owner or holder. An additional problem arises from the reporting of quota when used. The owner of quota is supposed to report to NMFS the specific tags (quota) that are used throughout the season. However, in many instances, it is not the recorded owner but another entity that reports the quota used. This is most likely a problem with related entities reporting the use of quota, which is another aspect of determining final quota ownership or control"* (Mitchell et al. 2011).

The Atlantic Surfclam and Ocean Quahog Information Collection Program was designed to collect information to assess quota share ownership, and control of the quota by tracking the transfer of cage tags in the surfclam and ocean quahog fisheries. Some industry members reported they would not disclose specific details on long-term leases on those data collection forms,[20] as they see it as a confidential business practice.

The ownership data collected for 2016 and 2017 includes very limited information on short and long-term leases, which suggests a lack of interest by industry members in reporting this information. Because of the lack of data to assess control from the context of tracking all long or

[20] Long-term contracts.

short term leases, "control" is defined as the possession of the cage tags during the fishing year, which is the power to decide if they will be used to harvest clams.[21]

5.1.1 Alternative 1: No Action/*Status Quo*

Under the no action alternative for excessive shares (alternative 1), the current management approach regarding excessive shares (i.e., share accumulation) would continue. Therefore, no specific limit or definition of an excessive share is included in the FMP as required under National Standard 4 of the MSA. The FMP would rely only on federal anti-trust provisions.

5.1.2 Alternative 2: Single Cap – Quota share ownership cap-only, with unlimited possession of cage tags allowed during the fishing year

Under alternative 2, a single quota share cap on how much quota share one individual or entity could hold would be established separately for surfclam and ocean quahog. The cap would be based on quota share ownership with unlimited possession of cage tags[22] throughout the year.[23] Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit.

This alternative allows leasing and other complex contracting and business practices (involving cage tag transfers) to continue without imposing a limit on the possession of cage tags during the fishing year; a limit would only be placed on quota share ownership. Essentially, these complex practices would be allowed to proceed without oversight.

5.1.2.1 Sub-Alternative 2.1: Quota share ownership cap based on highest level in the ownership data, 2016-2017

Under sub-alternative 2.1, the single quota share caps would be based on the highest level of quota share held by an individual or entity reported in the ownership data[24] for each fishery (surfclam and ocean quahog) for the 2016-2017 period,[25] as described below. The species-specific cap levels are not the same for surfclam and ocean quahog. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3.[26] The caps based on ownership data from 2016 to 2017 would be:

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[21] In the scallop fishery, a similar concept is used to tabulate quota accumulation levels within the fishing year, that is, "if you touch it" (hold the tags during the year), you have the ability to make decisions about whether those tags are used to land clams or not.

[22] There would be no limit on how many cage tags an individual or entity could possess (from initial tag allocation or transfer of tags) during the fishing year; therefore one entity could potentially possess up to 100% of the tags.

[23] All excessive share alternatives are applicable throughout the year.

[24] The term "Ownership Data" is used interchangeably with the "Atlantic Surfclam and Ocean Quahog Information Collection Program Data."

[25] On average, for the 2016-2017 period, 67% of the surfclam quota and 58% of the ocean quahog quota were landed (Table 4 in section 6.0).

[26] Note that the values in Tables 2 and 3 were rounded up for the monitoring process (e.g., 27.3 was rounded up to 28 and 27.7 was also rounded up to 28). These values were only rounded up because rounding down could potentially result in an existing entity being over the cap merely because of the rounding approach.

For surfclam –

- Option A: At the individual/business level, the quota share cap would be 28% under all models
- Option B: At the family level, the quota share cap would be 28% under all models
- Option C: At the corporate officer level, the quota share cap would be 28% under all models

For ocean quahog –

- Option A: At the individual/business level, the quota share cap would be 22% under all models
- Option B: At the family level, the quota share cap would be 22% under all models
- Option C: At the corporate officer level, the quota share cap would be 22% under all models

If fully consolidated, a 28% cap for surfclam could potentially result in a minimum of four large entities participating in this fishery(i.e., 28%, 28%, 28%, and 16%). If fully consolidated, a 22% cap for ocean quahog could potentially result in a minimum of five large entities participating in this fishery (i.e., 22%, 22%, 22%, 22%, and 12%).[27]

5.1.2.2 Sub-Alternative 2.2: Quota share ownership cap at 49%

Under sub-alternative 2.2, the single cap would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of annual allocation within the fishing year. If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%).

5.1.2.3 Sub-Alternative 2.3: Quota share ownership cap at 95%

Under sub-alternative 2.3, the single cap would be 95% for surfclam and 95% for ocean quahog. This sub-alternative was recommended for inclusion by the Surfclam and Ocean Quahog Committee. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly/oligopoly). If fully consolidated, a 95% cap could potentially result in a minimum of two entities participating in the fisheries (i.e., one very large entity and one small entity at 95% and 5%).

[27] The resulting number of minimum entities under excessive shares cap alternatives 2 through 4 assume that market demand equals supply. When this is not the case, the leasing market could be disrupted (because available quota is larger than product demand) which could result in smaller firms or entities not associated with a processor being driven out of business. In addition, it is also possible that under all alternatives evaluated, the resulting number of minimum entities could be larger than estimated in this document if full consolidation is not achieved.

Table 2. Surfclam maximum quota share ownership and maximum cage tag possession at the individual/business level, family level, and corporate officer level for various data tabulation models, 2016-2017.

Surfclam Values							
Ownership Percentage Model		**Affiliation Levels**					
		Individual / Business Level		**Family Level** (individual / business level + family level)		**Corporate Officer Level** (individual / business level + family level + corporate officer level)	
		2016	**2017**	**2016**	**2017**	**2016**	**2017**
Net Actual Percentage	Owned quota share	28	28	28	28	28	28
	Max cage tag possession	28	28	33	33	44	43
Cumulative 100%	Owned quota share	28	28	28	28	28	28
	Max cage tag possession	48	46	49	47	49	47

Terminology

1) Net Actual Percentage Model - Each owner's share in a business is used to determine the percentage of business ownership in that business's owned quota share or in the percentage of issued tags. When calculated, the credits and debits are tabulated throughout the year at the time of each transaction, and the maximum net balance that a person attained in a year is used for this determination.

2) Cumulative 100% Model - Any ownership interest in a quota share or ownership of cage tags by an individual or business is calculated as 100% of that quota share. When calculated, the credits/inputs (initial cage tag allocation and tag transfers in) accrue over the year for each person; debits/outputs (sale of quota share and tag transfers out) are not included in this calculation; and the total accrued credits for a year are used in the determination.

Affiliation Levels: *Individual/Business Level -* Smallest unit at the individual level or business (if an individual owner cannot be identified); ***Family Level -*** Includes any family associations that are not already accounted at the individual business level; and ***Corporate Officer Level -*** Includes association through corporate officer's that are not accounted for in the other levels.

Source: Analysis and Program Support Division, Greater Atlantic Regional Fisheries Office (GARFO).

Table 3. Ocean quahog maximum quota ownership and maximum cage tag possession at the individual/business level, family level, and corporate officer level for various data tabulation models, 2016-2017.

Ocean Quahog Values							
Ownership Percentage Model		**Affiliation Levels**					
		Individual / Business Level		**Family Level** (individual / business level + family level)		**Corporate Officer Level** (individual / business level + family level + corporate officer level)	
		2016	**2017**	**2016**	**2017**	**2016**	**2017**
Net Actual Percentage	Owned quota share	22	22	22	22	22	22
	Max cage tag possession	29	25	29	28	37	39
Cumulative 100%	Owned quota share	22	22	22	22	22	22
	Max cage tag possession	38	41	38	41	38	41

Terminology

1) Net Actual Percentage Model - Each owner's share in a business is used to determine the percentage of business ownership in that business's owned quota share or in the percentage of issued tags. When calculated, the credits and debits are tabulated throughout the year at the time of each transaction, and the maximum net balance that a person attained in a year is used for this determination.

2) Cumulative 100% Model - Any ownership interest in a quota share or ownership of cage tags by an individual or business is calculated as 100% of that quota share. When calculated, the credits/inputs (initial cage tag allocation and tag transfers in) accrue over the year for each person; debits/outputs (sale of quota share and tag transfers out) are not included in this calculation; and the total accrued credits for a year are used in the determination.

Affiliation Levels: *Individual/Business Level -* Smallest unit at the individual level or business (if an individual owner cannot be identified); ***Family Level -*** Includes any family associations that are not already accounted at the individual business level; and ***Corporate Officer Level -*** Includes association through corporate officer's that are not accounted for in the other levels.

Source: Analysis and Program Support Division, Greater Atlantic Regional Fisheries Office (GARFO).

5.1.3 Alternative 3: Quota Share and Cage Tag Cap – A single cap for quota share and cage tags

Under alternative 3, a percent cap that applies to both quota share and the possession of cage tags would be established separately for surfclam and ocean quahog. Since the cap under this alternative is based on the possession of cage tags that are from initial annual allocation and transferred, it accounts for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags)[28] that are prevalent in the fisheries when setting the cap limit.

5.1.3.1 Sub-Alternative 3.1: Quota share and cage tag cap based on highest level of tag possession in the data, 2016-2017

Under sub-alternative 3.1, the caps would be based on the highest level of possession of both initially allocated and transferred cage tags by an individual or entity reported in the ownership[29] and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period, as described below. The species-specific cap levels are not the same for surfclam and ocean quahog. The caps under this alternative would depend on the determination of amounts of tags possessed under the cumulative 100% model or net actual percentage model and affiliate level (individual/business, family, or corporate officer) selected by the Council. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3. The caps are based on ownership and transfer data from 2016 to 2017 under this sub-alternative would be:

For surfclam -

- Option A: At the **individual/business level**, the cap would be:
  - 28% under the net actual percentage model
  - 48% under the cumulative 100% model
- Option B: At the **family level**, the cap would be:
  - 33% under the net actual percentage model
  - 49% under the cumulative 100% model
- Option C: At the **corporate officer level**, the cap would be:
  - 44% under the net actual percentage model
  - 49% under the cumulative 100% model

For ocean quahog -

- Option A: At the **individual/business level**, the cap would be:
  - 29% under the net actual percentage model
  - 41% under the cumulative 100% model
- Option B: At the **family level**, the cap would be:

[28] The Compass Lexecon Report and CIE review indicated a need for reliable information regarding both quota share ownership and control of quota in the surfclam and ocean quahog fisheries, to implement an excessive shares definition. Information showing detailed quota transfers and ownership relationships among final quota holders is important in assessing quota share ownership and control (Mitchell et al., 2011, Walden 2011).

[29] The term "Ownership Data" is used interchangeably with the "Atlantic Surfclam and Ocean Quahog Information Collection Program Data."

    - 29% under the net actual percentage model
    - 41% under the cumulative 100% model
- Option C: At the **corporate officer level**, the cap would be:
    - 39% under the net actual percentage model
    - 41% under the cumulative 100% model

The potential resulting number of minimum entities (if fully consolidated) would vary depending on the model and affiliate level chosen. The resulting number of minimum entities under each scenario are presented in section 7.0.

5.1.3.2 Sub-Alternative 3.2: Quota share and cage tag cap at 40%

Under sub-alternative 3.2, the cap on quota share and the possession of both initially allocated and transferred cage tags by an individual or entity would be 40% for surfclam and 40% for ocean quahog. This is based the "Rule of Three" notion (Mitchell et al. 2011, Walden 2011). "In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails." And "An excessive-share cap of 40% assures that there would be at least three processors operating at reasonable output levels" (Walden 2011). If fully consolidated, a 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%).

5.1.3.3 Sub-Alternative 3.3: Cap at 49%

Under sub-alternative 3.3, the cap on quota share and the possession of both initially allocated and transferred cage tags by an individual or entity would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share of the total allowable landings. If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%).

5.1.4 Alternative 4: Two-Part Cap Approach – A cap on quota share ownership and a second, higher cap on cage tags

Under alternative 4, a two-part cap approach would be implemented for each surfclam and ocean quahog, with the first part being a cap on quota share ownership, and a second, higher cap on the possession of both initially allocated and transferred cage tags by an individual or entity. This is based on recommendations for a two-part cap provided in the Compass Lexecon Report. Because alternative 4 is based on a two-part cap approach that limits the possession of both owned quota share and cage tags by an individual or entity, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota, and it accounts for transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that occur in these fisheries**.**

5.1.4.1 Sub-Alternative 4.1: Two-part cap based on highest level in the ownership and transfer data, 2016-2017

Under sub-alternative 4.1, the two-part cap approach includes one cap on quota share ownership and a second cap on the possession of cage tags by an individual or entity based on the highest levels reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period, as described below. The species-specific cap levels are not the same for surfclam and ocean quahog. The two-part cap values under this alternative would depend on the determination of two-part cap levels under the cumulative 100% model or net actual percentage model and affiliate level (e.g., individual/business, family, or corporate officer) selected by the Council. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3. The two-part caps based on ownership and transfer data from 2016 to 2017 would be:

For surfclam -

- Option A: At the **individual/business level**, the cap would be:
    - 28% quota share ownership / 28% cage tag possession under the net actual percentage model
    - 28% quota share ownership / 48% cage tag possession under the cumulative 100% model
- Option B: At the **family level**, the cap would be:
    - 28% quota share ownership / 33% cage tag possession under the net actual percentage model
    - 28% quota share ownership / 49% cage tag possession under the cumulative 100% model
- Option C: At the **corporate officer level**, the cap would be:
    - 28% quota share ownership / 44% cage tag possession under the net actual percentage model
    - 28% quota share ownership / 49% cage tag possession the cumulative 100% model

For ocean quahog -

- Option A: At the **individual/business level**, the cap would be:
    - 22% quota share ownership / 29% cage tag possession under the net actual percentage model
    - 22% quota share ownership / 41% cage tag possession under the cumulative 100% model
- Option B: At the **family level**, the cap would be:
    - 22% quota share ownership / 29% cage tag possession under the net actual percentage model
    - 22% quota share ownership / 41% cage tag possession under the cumulative 100% model
- Option C: At the **corporate officer level**, the cap would be:
    - 22% quota share ownership / 39% cage tag possession under the net actual percentage model
    - 22% quota share ownership / 41% cage tag possession the cumulative 100% model

The potential resulting number of minimum entities (if fully consolidated) would vary depending on the model and affiliate level chosen. The Council needs to choose a specific affiliate level (e.g., individual/business, family, or corporate officer) and model (cumulative 100% model or net actual percentage model) to implement and monitor a specific cap under this alternative. The resulting number of minimum entities under each scenario are presented in section 7.0.

5.1.4.2 Sub-Alternative 4.2: Two-part cap based on highest level in the ownership and transfer data, 2016-2017, plus 15% added to the maximum levels to allow for additional consolidation

Under sub-alternative 4.2, the two-part cap approach would be based on values reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period (as done under sub-alternative 4.1). However, under this sub-alternative, 15% is added to the maximum values reported in the ownership and transfer data for 2016-2017 to allow for additional consolidation (Tables 2 and 3). The 15% value was recommended by some industry representatives and is expected to provide flexibility for efficient firms in the surfclam and ocean quahog fisheries to consolidate further if market conditions allow. The species-specific cap levels are not the same for surfclam and ocean quahog. As with sub-alternative 4.1, the two-part cap values under this alternative would depend on the determination of two-part cap levels under the cumulative 100% model or net actual percentage model and affiliate level (e.g., individual/business, family, or corporate officer) selected by the Council. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3. The two-part caps based on ownership and transfer data from 2016 to 2017 would be:

(*Note: these values were calculated by adding 15% for anticipated growth to the values presented under sub-alternative 4.1*)

For surfclam -

- Option A: At the **individual/business level**, the cap would be:
    - 43% quota share ownership / 43% cage tag possession under the net actual percentage model
    - 43% quota share ownership / 63% cage tag possession under the cumulative 100% model
- Option B: At the **family level**, the cap would be:
    - 43% quota share ownership / 48% cage tag possession under the net actual percentage model
    - 43% quota share ownership / 64% cage tag possession under the cumulative 100% model
- Option C: At the **corporate officer level**, the cap would be:
    - 43% quota share ownership / 59% cage tag possession under the net actual percentage model
    - 43% quota share ownership / 64% cage tag possession under the cumulative 100% model

For ocean quahog -

- Option A: At the **individual/business level**, the cap would be:
  - 37% quota share ownership / 44% cage tag possession under the net actual percentage model
  - 37% quota share ownership / 56% cage tag possession under the cumulative 100% model
- Option B: At the **family level**, the cap would be:
  - 37% quota share ownership / 44% cage tag possession under the net actual percentage model
  - 37% quota share ownership / 56% cage tag possession under the cumulative 100% model
- Option C: At the **corporate officer level**, the cap would be:
  - 37% quota share ownership / 54% cage tag possession under the net actual percentage model
  - 37% quota share ownership / 56% cage tag possession under the cumulative 100% model

The potential resulting number of minimum entities (if fully consolidated) would vary depending on the model and affiliate level chosen. The resulting number of minimum entities under each scenario are presented in section 7.0.

5.1.4.3 Sub-Alternative 4.3: Two-part cap – quota share ownership cap at 30% and possession of cage tag cap at 60%

Under sub-Alternative 4.3, the quota share ownership cap would be 30% and the cap on cage tags would be 60%. These values are based on recommendations for a two-part cap provided in the Compass Lexecon Report. This alternative could potentially result in a minimum of four large entities (if fully consolidated) participating in the fisheries (i.e., 30%, 30%, 30%, and 10% quota share ownership cap).

5.1.4.4 Sub-Alternative 4.4: Preferred – Two-part cap – Quota share ownership cap and a second, higher possession of cage tag cap; Surfclam: 35/65% and Ocean Quahog: 40/70%

The Surfclam and Ocean Quahog Committee met on September 17, 2019 to review and provide input on the public hearing comments from the Excessive Shares Amendment received during the August 1 – September 14, 2019 public comment period. After reviewing the public comments, the Surfclam and Ocean Quahog Committee passed a motion to add sub-alternative 4.4 to the range of excessive shares cap alternatives for consideration for the following reasons: 1) the cap values under sub-alternative 4.4 are a slight modification from the values presented under sub-alternative 4.3, 2) the cap values under sub-alternative 4.4 represent a "compromise alternative" (according to most public comments received) that would meet the amendment objective of setting excessive shares cap levels for these fisheries, 3) these cap values would allow for some expansion (further consolidation) given the current ownership levels in the fisheries if needed, and 4) industry indicated during public hearings there are currently two plants processing ocean quahog. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership under this Council-preferred excessive shares cap alternative.

5.1.5 Alternative 5: Quota share ownership cap-only at 40% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota

Under alternative 5, the quota share cap would be 40% for surfclam and 40% for ocean quahog with unlimited possession of cage tags allowed during the fishing year, plus, Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the annual catch target (ACT) or overall quota level and A shares. B shares are not released until all A shares are used/exhausted.

Since the cap under this alternative is based on ownership of quota shares only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing and other complex contracting and business practices (involving cage tag transfers) to continue without imposing a limit on the possession of cage tags during the fishing year; a limit would only be placed on quota share ownership. Essentially, these complex practices would be allowed to proceed without oversight.

The 40% cap under this alternative is based on the "Rule of Three" notion (Mitchell et al. 2011, Walden 2011). "In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails." And "An excessive-share cap of 40% assures that there would be at least three processors operating at reasonable output levels" (Walden 2011).

This alternative would align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). The FMAT noted that the "two-part system" (i.e., cap on quota share ownership, unlimited possession of cage tags, plus Quota A/B shares) would not be needed if the ACT (or overall quota level) was aligned each year with the anticipated market demand. Alternatively, an advantage of Quota A and Quota B shares is that it allows additional flexibility for increasing harvests if there is a surge in demand for surfclam or quahog midway through the fishing year. Lastly, this alternative could potentially result in a minimum of three large entities (if fully consolidated) participating in the fisheries (i.e., 40%, 40%, and 20%).

Box 5.1.5 below shows a hypothetical example of how the two quota-tier system (Quota A shares and Quota B shares) would work the first year of implementation (year 4) for surfclam and ocean quahog. In this example, the same overall quota levels that have been in place for surfclam and ocean quahog for the past 15 years are used in year 4. In addition, under this example a 3-year average of landings (for years 1-3) is used to derive Quota A shares for year 4. The difference between the overall ACT level and Quota A shares for year 4 is used to determine the Quota B shares level for that year.

As shown in Box 5.1.5, the overall quota allocated to each fishery in bushels or number of issued cage tags do not change in year 4 when compared to prior years. However, while in years 1-3, the overall number of cage tags issued to each fishery (i.e., corresponding to the quota for each fishery;

106,250 cage tags for surfclam and 166,656 cage tags for ocean quahog) would be released at the onset of the fishing year, under this alternative, only the Quota A shares and associated number of cage tags for that quota would be released at the onset of the fishing year and Quota B shares would be released when Quota A shares are used/exhausted.[30] As an example, for surfclam, Quota A shares, 2.352 million bushels or 73,500 cage tags would be released at the beginning on the fishing year 4, when this quota and associated number of cage tags have been used, then Quota B shares of 1.048 million bushels or 32,750 cage tags would be released that same fishing year (year 4). While under this alternative, the release of the quota (and associated cage tags) is split into two components (Quota A shares and Quota B shares), the overall quota level and number of cage tags available during the entire fishing year 4 is identical to that from prior fishing years (years 1-3).

Box 5.1.5. Hypothetical derivation of Quota A shares and Quota B shares (and cage tags) for surfclam and ocean quahog under alternatives 5 and 6.

Year	Quota Million bushels	Landings Million bushels	Quota A shares Million bushels	Quota B shares Million bushels
Surfclam				
1	3.400 (106,250 cage tags)	2.364 (73,875 cage tags)	NA	NA
2	3.400 (106,250 cage tags)	2.354 (73,563 cage tags)	NA	NA
3	3.400 (106,250 cage tags)	2.339 (73,094 cage tags)	NA	NA
4	3.400 (106,250 cage tags)	NA	2.352 (73,500 cage tags)	1.048 (32,750 cage tags)
Ocean quahog				
1	5.333 (166,656 cage tags)	3.196 (99,875 cage tags)	NA	NA
2	5.333 (166,656 cage tags)	3.007 (93,968 cage tags)	NA	NA
3	5.333 (166,656 cage tags)	3.075 (96,094 cage tags)	NA	NA
4	5.333 (166,656 cage tags)	NA	3.093 (96,656 cage tags)	2.240 (70,000 cage tags)

NA = not applicable or not available.

5.1.6 Alternative 6: Quota share ownership cap-only at 49% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota

Under alternative 6, the cap would be 49% for surfclam and 49% for ocean quahog with unlimited possession of cage tags allowed during the fishing year plus, Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT or overall quota level and A shares. B shares are not released until all A shares are used/exhausted. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of quota share allocation within the fishing year.

[30] If this alternative is implemented, NMFS will have to determine how to release Quota B shares to allocation holders at the time the B shares are released.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing and other complex contracting and business practices (involving cage tag transfers) to continue without imposing a limit on the possession of cage tags during the fishing year; a limit would only be placed on quota share ownership. Essentially, these complex practices would be allowed to proceed without oversight.

The two-tier quota under this alternative would align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011).

The FMAT noted that the "two-part system" (i.e., cap on quota share ownership, unlimited possession of cage tags, plus Quota A/B shares) would not be needed if the ACT (or overall quota level) was aligned each year with the anticipated market demand. Alternatively, an advantage of Quota A and Quota B shares is that it allows additional flexibility for increasing harvests if there is a surge in demand for surfclam or quahog midway through the fishing year. Lastly, this alternative could potentially result in a minimum of three entities (if fully consolidated) participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%).

For a hypothetical example of how the two quota-tier system (Quota A shares and Quota B shares) would work for surfclam and ocean quahog see section 5.1.5.

5.2 Excessive Shares Review Alternatives

5.2.1 Alternative 1: No Action/*Status Quo* (Review Process)

Under the no action alternative for excessive shares review (alternative 1), there would not be a requirement for periodic review of implemented excessive shares measures.

5.2.2 Alternative 2: Preferred – Require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed

Allowing for a periodic review of excessive shares measures that the Council adopted would permit the Council to review their measures to determine if conditions in the fisheries changed over time and warranted revisions. Conditions in the fisheries have changed over time since the FMP was implemented and the ITQ system became effective, and those conditions are likely change in the future. Therefore, an excessive shares measure or specific measures established at an appropriate level now could over time become inefficiently high or low.

In order to facilitate any necessary modifications to the cap levels, the Council could recommend adding modification of the excessive shares cap level to the list of management actions that could be implemented via the framework adjustment process (alternative 5.3). However, if major changes to the overall excessive shares measures are needed, an amendment process will likely be needed.

This alternative would provide an enforceable provision for regular review and evaluation of the performance of the cap for the surfclam and ocean quahog ITQ fisheries. However, this alternative does not preclude the Council from reviewing any implemented excessive shares measures before the official review time period (i.e., 10 year review period).

5.3 Framework Adjustment Process Alternatives

A framework is an action that adjusts measures that are within the scope and criteria established by the FMP within a range as defined and analyzed in the FMP. Amendment 12 to the Surfclam and Ocean Quahog FMP implemented a framework adjustment process that allows management measures to be added or modified through this streamline public process (MAFMC 1998b). The range of frameworkable management measures were subsequently revised in Amendment 16 to the FMP (MAFMC 2011). The list of possible management measures to be addressed via the framework adjustment process included in the FMP include (50 CFR §648.79):

- Adjustments within existing ABC control rule levels
- Adjustments to the existing MAFMC risk policy
- Introduction of new AMs, including sub-ACTs
- Description and identification of EFH (and fishing gear management measures that impact EFH)
- Habitat areas of particular concern
- Set-aside quota for scientific research
- VMS
- Suspension or adjustment of the surfclam minimum size limit

Frameworks typically take a minimum of 1-year to be completed; with a minimum of two framework meetings and approximately 4-6 months for rulemaking and implementation. Adding measures as frameworkable under the FMP in order to address potential future changes may provide for efficiencies in the process.

5.3.1 Alternative 1: Preferred – No Action/*Status Quo* (Framework Adjustment)

Under the no action alternative (alternative 1), the list of management measures that have been identified in the FMP that could be modified via the framework adjustment process would remain unchanged.

5.3.2 Alternative 2: Add excessive shares cap level to the list of measures to be adjusted via framework

This alternative would expand of the list of framework adjustment measures that have been identified in the FMP. The ITQ program measure that would be added to the list is: 1) excessive shares cap level.

This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap), only if the modification would not result in an entity having to divest. Including

this measure would provide flexibility to managers to make changes to the caps in a timely manner. The impacts of any future framework action related to the excessive cap level would be analyzed through a separate action, which would include public comment opportunities and documentation of compliance with all applicable laws.

5.4 Multi-Year Management Measures Alternatives

Surfclam and ocean quahog regulations allow multi-year annual quota specification to be set for up to 3 years at a time (CFR §648.71 and 648.72). Therefore, current regulations allow, but do not obligate the Council to specify commercial quotas and other management measure for up to 3 years. Multi-year regulations have been implemented for all fisheries managed by the MAFMC to relieve administrative demands on the Council and NMFS imposed by annual specification requirements. Longer term specifications provide greater regulatory consistency and predictability to the fishing sectors.

Specifications of annual quotas are prepared in the final year of the quota period unless there is a need for an interim quota modification. It is also stipulated in the regulations that on an annual basis, the MAFMC staff produce and provide to the Council an Atlantic surfclam and ocean quahog annual quota recommendation paper based on the ABC recommendation of the Scientific and Statistical Committee (SSC), the latest available stock assessment report prepared by NMFS, data reported by harvesters and processors, and other relevant data. Based on that report, and at least once prior to August 15 of the year in which a multi-year annual quota specification expires, the MAFMC, following an opportunity for public comment, will recommend to the Regional Administrator annual quotas and other management measures.

5.4.1 Alternative 1: No Action/*Status Quo* (Multi-Year Measures)

Under this no action alternative for multi-year management measures (alternative 1), there would be no changes to the process to set surfclam and ocean quahog management specifications for up to 3 years.

Regulations for the surfclam and ocean quahog specifications setting process at 50 CFR §648.72, stipulate that annual catch quotas can be established for up to a 3-year period. The specifications setting process is described in detail above.

5.4.2 Alternative 2: Preferred – Specifications to be set for maximum number of years needed to be consistent with the Northeast Regional Coordinating Council (NRCC)-approved stock assessment schedule

Under alternative 2, specifications could be set for the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule.[31] This alternative would provide additional flexibility as specifications could be set to cover the time period until a new surfclam and/or ocean quahog stock assessment is produced. New specifications of annual quotas would be prepared in the final year of the quota period unless there is a need for interim quota modifications.

[31] For example, under the current schedule, new survey information will be available every 4 years for surfclam and every 6 years for ocean quahog, after which a stock assessment may be conducted.

Council staff would coordinate with Northeast Fisheries Science Center (NEFSC) staff, during the first quarter of each year (during the multi-year specifications period) to assess whether there is any relevant information regarding these fisheries that need to be addressed or used to produce interim quota modifications. The results would be provided to the Council in a memorandum. In the year in which a multi-year annual quota specifications expire, Council staff would produce a fishery information document and specification recommendation memorandum (as is done for all the Council managed FMPs) to provide to the SSC and the Council.

Lastly, under the current regulations at §648.72, there is some terminology (or outdated regulatory language) that is no longer used when deriving catch and landings limits for these species (e.g., DAH or Domestic Annual Harvest; DAP or Domestic Annual Processing) that would be removed from the regulations under this alternative. In addition, the requirements for the contents of annual quota reports are not consistent with the current process for setting catch and landings limits based on the stock assessment (i.e., outdated terminology), therefore that language would be revised to reflect current practices for development of fishery information documents and recommendations memorandum.

None of the other existing catch and landings limits regulations, accountability measures, reporting requirements or ITQ system management procedures will change under alternative 2.

5.5 Alternatives Considered but Rejected from Further Analysis

Since the initiation of this amendment, the Council considered a range of different alternatives to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges corresponding to the purpose and need statements described in section 4.1. To address these statements, the Council considered various approaches. Concepts or options that were discussed but rejected from further consideration, are described below for joint ventures (section 5.5.1) and other excessive shares cap levels (sections 5.5.2 and 5.5.3).

5.5.1 Allow for Joint Ventures in these fisheries

The surfclam and ocean quahog harvest levels have been well below the quota levels established for those fisheries for many years (Table 4 in section 6.0). This alternative could allow for additional product to be sold and competition increased. For example, the FMAT initially discussed the possibility of joint ventures with foreign partners in which clams harvested by the United States fishermen could be delivered to foreign processing vessels in the EEZ. This alternative was considered but rejected by the Council for further analysis as it was deemed impractical for these fisheries (e.g., perishable nature of the product; ITQ system that requires cages to be landed with tags, etc.). In addition, some industry representatives indicated that they would not like to sell their clams to international companies competing with their interests.

5.5.2 Set the cap at a specific level. But allow for opportunity for further consolidation upon review by NMFS

Conditions in the fisheries have changed over time since the FMP was implemented and the ITQ system became effective, and those conditions are likely change in the future. Therefore, an

excessive shares measure or specific cap level established at an appropriate level now could over time become inefficiently high or low. This alternative would allow any entity or firm to request NMFS to review information (e.g., excessive shares cap level, market conditions, other relevant information) to assess if further consolidation (beyond any Council implemented excessive cap share level) was warranted for that entity or firm. This alternative was considered but rejected for further consideration as it would require a large amount of data to be provided by the industry; including confidential data on production costs, profitability, production capacity, etc. This information is not presently available to NMFS. In addition, this alternative would also require extensive review and analysis by the NEFSC Social Science Branch, which may not have the staff resource time, making this approach impractical from the Council's perspective.

5.5.3 Use the seven steps on excessive shares proposal presented in the Compass Lexecon Report

The seven steps on the excessive shares proposal presented in the Compass Lexecon Report includes the use of the HHI, assessment of the breadth of the market, the scope and quantity of substitute products, the level of excess capacity, the degree of product heterogeneity, the relative bargaining power of buyers and sellers, the ability to price discriminate, ease of entry, and efficiencies -or economies of scale, the size of the fringe, and the sources of supply to processors (Mitchell et al. 2011, Walden 2011). However, the FMAT indicated that this methodology requires a large amount of quantitative information that is not currently available, would require a large amount of data to be provided by the industry, and would also require frequent revision of caps due to changes in market dynamics. Therefore, the Council determined that this approach is impractical.

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 valued ecosystem components (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, 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 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 4 (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. 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. However, in the northern range, ocean quahog inhabit 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 off 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% 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 are 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.

Table 4. Federal Surfclam and Ocean Quahog Quotas and Landings: 1998 - 2020.

	Surfclam ('000 bu)			Ocean Quahog ('000 bu)		
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%	3,591	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%	3,007	5,333	56%
2016	2,339	3,400	69%	3,075	5,333	57%
2017	2,192[c]	3,400	64%[c]	3,172[c]	5,333	59%[c]
2018	NA	3,400	NA	NA	5,333	NA
2019	NA	3,400	NA	NA	5,333	NA
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 2017 data. NA = Not yet available. Source: NMFS Clam Vessel Logbook Reports.

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

Reports on stock status, including SAW/SARC (Stock Assessment Workshop/Stock Assessment Review Committee) reports, and assessment update reports are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/population-assessments/northeast-region-stock-assessment-process. EFH Source Documents, which include 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/.

6.1.2.1 Atlantic Surfclam

The surfclam stock assessment was peer reviewed and approved for use by management at Stock Assessment Workshop 61 (SAW 61; NEFSC 2017a). A statistical catch at age and length model called Stock Synthesis was used. Reports on "Stock Status," including assessment and reference point updates, SAW reports, and SARC panelist reports are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/population-assessments/northeast-region-stock-assessment-process.

New reference points were developed for SAW 61 which are more justified scientifically. The new biomass reference points and measures of stock biomass are ratios rather than absolute biomass in weight. This approach allows for conclusions about the status of the surfclam stock despite substantial uncertainty in the actual biomass of the stock (NEFSC 2017a).

The surfclam stock was not overfished in 2015 (Figure 1; NEFSC 2017a). Based on recommended reference points for the whole stock which use spawning stock biomass (SSB), estimated $SSB_{2015}/SSB_{Threshold} = 2.54$ (probability overfished < 0.01). For surfclam, SSB is almost equal to total biomass. Trends expressed as the ratio $SSB/SSB_{Threshold}$ are more reliably estimated than SSB. For the whole stock, relative SSB ($SSB/SSB_{Threshold}$) declined during the last fifteen years but is still above the target.

Overfishing did not occur in 2015 (Figure 2; NEFSC 2017a). Based on new recommended reference points, estimated $F_{2015}/F_{Threshold} = 0.295$ (probability overfishing < 0.01). Trends expressed as the ratio $F/F_{Threshold}$ are more reliably estimated than absolute fishing mortality rates. For the whole stock, the trend in relative F ($F/F_{Threshold}$) generally increased during the last fifteen years (despite recent declines in the south) but is still below the threshold.

Trends expressed as the ratio of recruitment (R) and mean recruitment in an unfished stock (R_0) are more reliably estimated than absolute recruitment (Figure 3; NEFSC 2017a). The trend in relative recruitment is measured using the ratio R/R_0. Recruitment generally increased over the last decade, and in 2015 R/R_0 was 0.57 in the north, 0.97 in the south, and 0.75 for the stock as a whole, indicating recruitment in 2015 was about 57%, 97% and 75% of the maximum long-term average in the three regions. These recruitment patterns are probably normal in a surfclam stock at relatively high biomass and with low fishing mortality. Recruitment for the whole stock is

measured as the geometric mean of R/R_0 in the northern and southern areas and is more uncertain than estimates for either area.

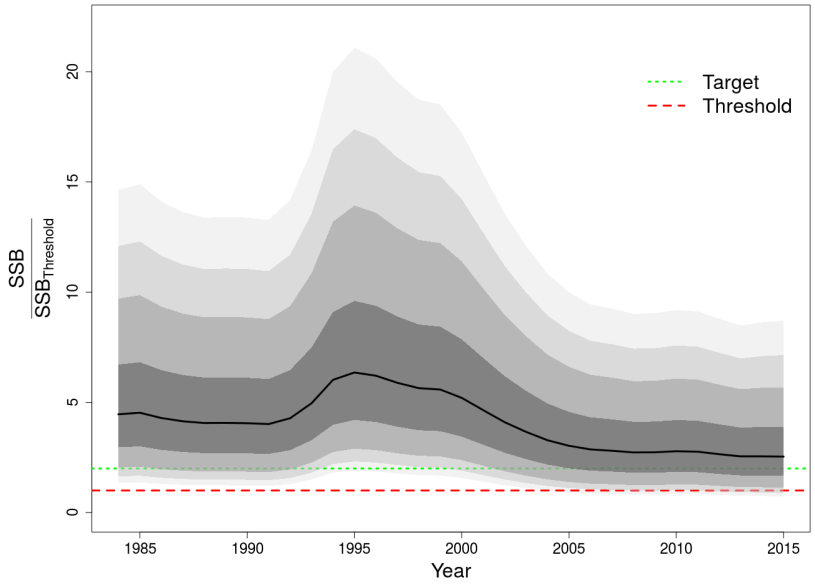


Figure 1. Trends in relative spawning stock biomass ($SSB/SSB_{Threshold}$) for the whole Atlantic surfclam stock during 1984-2015. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The green short-dash line at $SSB/SSB_{Threshold} = 2$ is the management target. The red long-dash line at $SSB/SSB_{Threshold} = 1$ is the level that defines an overfished stock* (NEFSC 2017a).

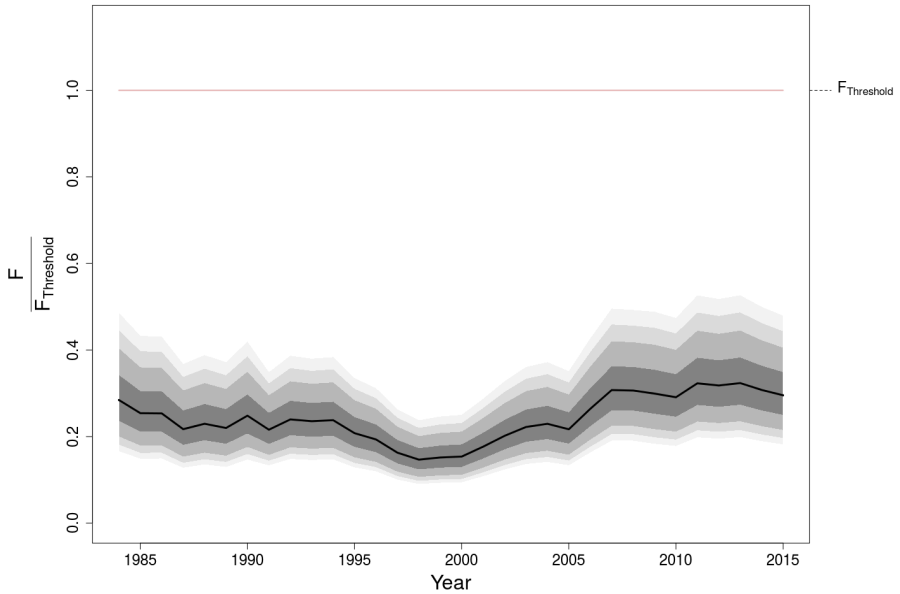


Figure 2. Trends in relative fishing mortality $F/F_{Threshold}$ for the whole Atlantic surfclam stock 1984-2015. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The solid line at $F/F_{Threshold} = 1$ is the new fishing mortality threshold reference point* (NEFSC 2017a).

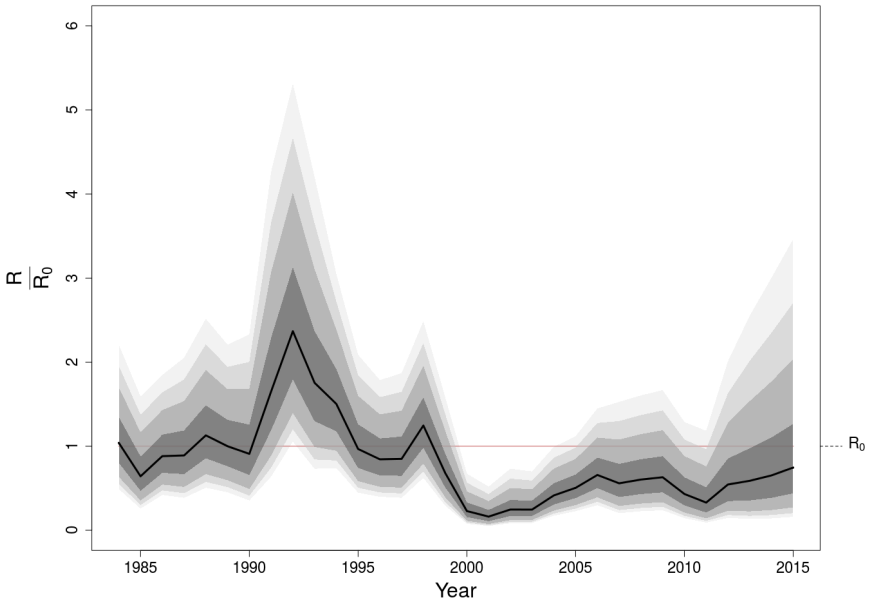


Figure 3. Trends in relative recruitment (R/R_0 for age zero recruits) for the whole Atlantic surfclam stock during 1984-2015. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The horizontal line is mean recruitment in an unfished stock* (NEFSC 2017a).

6.1.2.2 Ocean Quahog

The ocean quahog stock assessment was peer reviewed and approved for use by management at Stock Assessment Workshop 63 (SAW 63; NEFSC 2017b). A statistical catch at length model called Stock Synthesis was used. Reports on "Stock Status," including assessment and reference point updates, SAW reports, and SARC panelist reports are available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/population-assessments/northeast-region-stock-assessment-proces.

The ocean quahog was not overfished in 2016 (Figure 4; NEFSC 2017b). Based on SAW 63 reference points from the 2017 assessment for the stock, estimated $SSB_{2016}/SSB_{Threshold} = 2.04$ (probability overfished < 0.01), where SSB is spawning stock biomass.

Overfishing did not occur in 2016 (Figure 5; NEFSC 2017b). Based on SAW 63 reference points, estimated $F_{2016}/F_{Threshold} = 0.246$ (probability overfishing < 0.01), where F is fishing mortality rate.

There is little information about annual recruitment variability for ocean quahog. Model estimated recruitment has been stable and near unfished recruitment levels since 2000 (NEFSC 2017b).

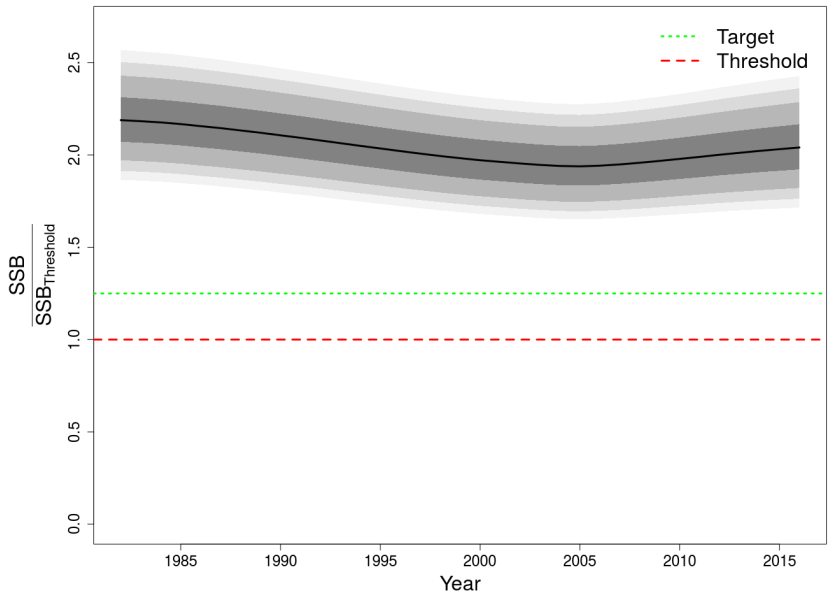


Figure 4. Trends in relative spawning stock biomass (SSB/SSB$_{Threshold}$) for the whole ocean quahog stock during 1982-2016. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The green short-dash line at SSB/SSB$_{Threshold}$ = 1.25 is the management target. The red long-dash line at SSB/SSB$_{Threshold}$ = 1 is the level that defines an overfished stock* (NEFSC 2017b).

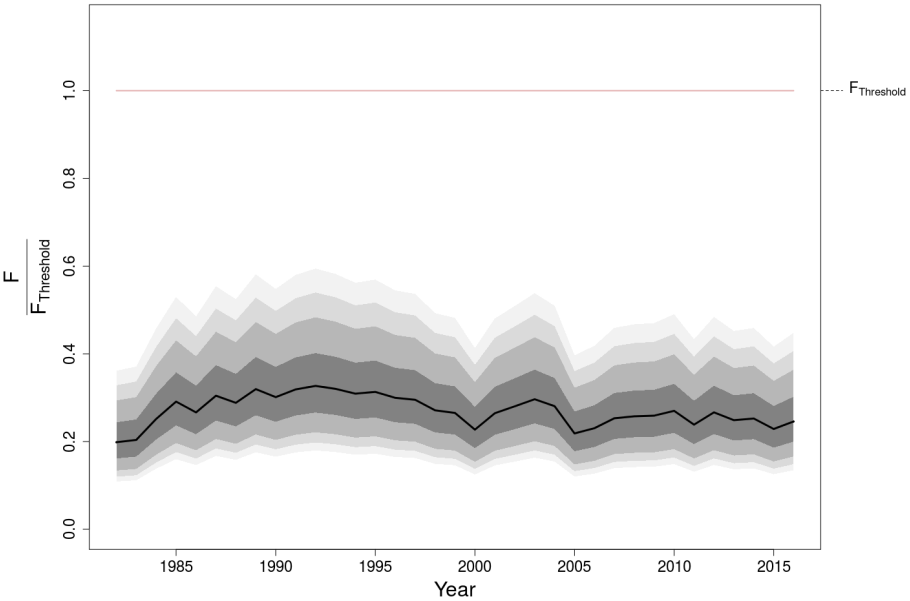


Figure 5. Trends in relative fishing mortality F/F$_{Threshold}$ for ocean quahog stock 1982-2016. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The solid line at F/F$_{Threshold}$ = 1 is the new fishing mortality threshold reference point* (NEFSC 2017b).

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-targeted species by the surfclam and ocean quahog fisheries based on observer data from 2016 was provided by Toni Chute (Personal Communication, November 15, 2017).

There were 15 observed ocean quahog trips (out of a total of 957 trips, so 1.6% of trips were observed) and 28 observed surfclam trips (out of a total of 2,414, so 1.2% 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 5 and 6. 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 7 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 8 and 9 list the amounts and types of bycatch reported from individual trips to show variability between trips.

Lastly, there were small quantities of ocean quahog caught in observed surfclam trips and vice versa. In all, ocean quahog contributed with 0.65% of the total catch on observed surfclam trips and surfclam contributed with 0.48% of the total catch on observed ocean quahog trips.

Table 5. 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 6. 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 7. 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 8. 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 9. 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

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.

For the other non-target species, 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). [32] 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 physical habitats 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 ice sheet and the subsequent rise in sea level. Currents and waves have since modified this basic structure.

[32] 2016 NE Skate Stock Status Update available at: https://s3.amazonaws.com/nefmc.org/4_NEFSC_SkateMemo_July_2017_170922_085135.pdf

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

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 - 200 m water depth) 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 into the shelf; however, the Hudson Shelf Valley is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island. Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

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

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

Sediments are uniformly distributed over the shelf in this region. A sheet of sand and gravel varying in thickness from 0 - 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The

sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf but is common in the Hudson Shelf Valley.

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% 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% sand, 26% gravel, and 6% silt/mud. The seafloor is classified as about 52% flat, 26% depression, 19% slope, and 3% steep (Table 10).

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 10. 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% 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, but beyond about 125 feet 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% of all the ranked ten-minute squares for the area where ocean quahog were caught in the NEFSC surfclam and ocean quahog dredge surveys. Distribution in the western Atlantic ranges in [water] depths from 30 feet to about 800 feet. Ocean quahog are rarely found where bottom water temperatures exceed 60 ^{o}F, 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; descriptions of these are given in 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. 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 (Federal Register) 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), 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 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 Sholas) than was the case in 2003. The habitat impact analysis conducted by the NMFS concluded that the adverse impacts of renewed clam dredging on Georges Shoal would be minimal and/or temporary as long as dredging was confined to the shallower, more dynamic sandy bottom habitats 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 Omnibus EFH Amendment 2 (OHA2) which implemented measures designed to minimize to the extent practicable the adverse effects of fishing on essential fish habitat.[33] 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% 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 wide and about 22 feet 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, 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 deep for surfclam and 3.5 inches 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 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

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

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% 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 throughout various habitat management areas (HMAs) selected by the NEFMC (Figures 6 and 7). 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.[34]

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 fishing effects on habitat to the extent practicable and is consistent with the underlying objectives of OHA2. The Clam Dredge Framework Action has been submitted to NMFS and was approved by NOAA on May 19, 2020, and became effective on June 18, 2020. It

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

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).[35]

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

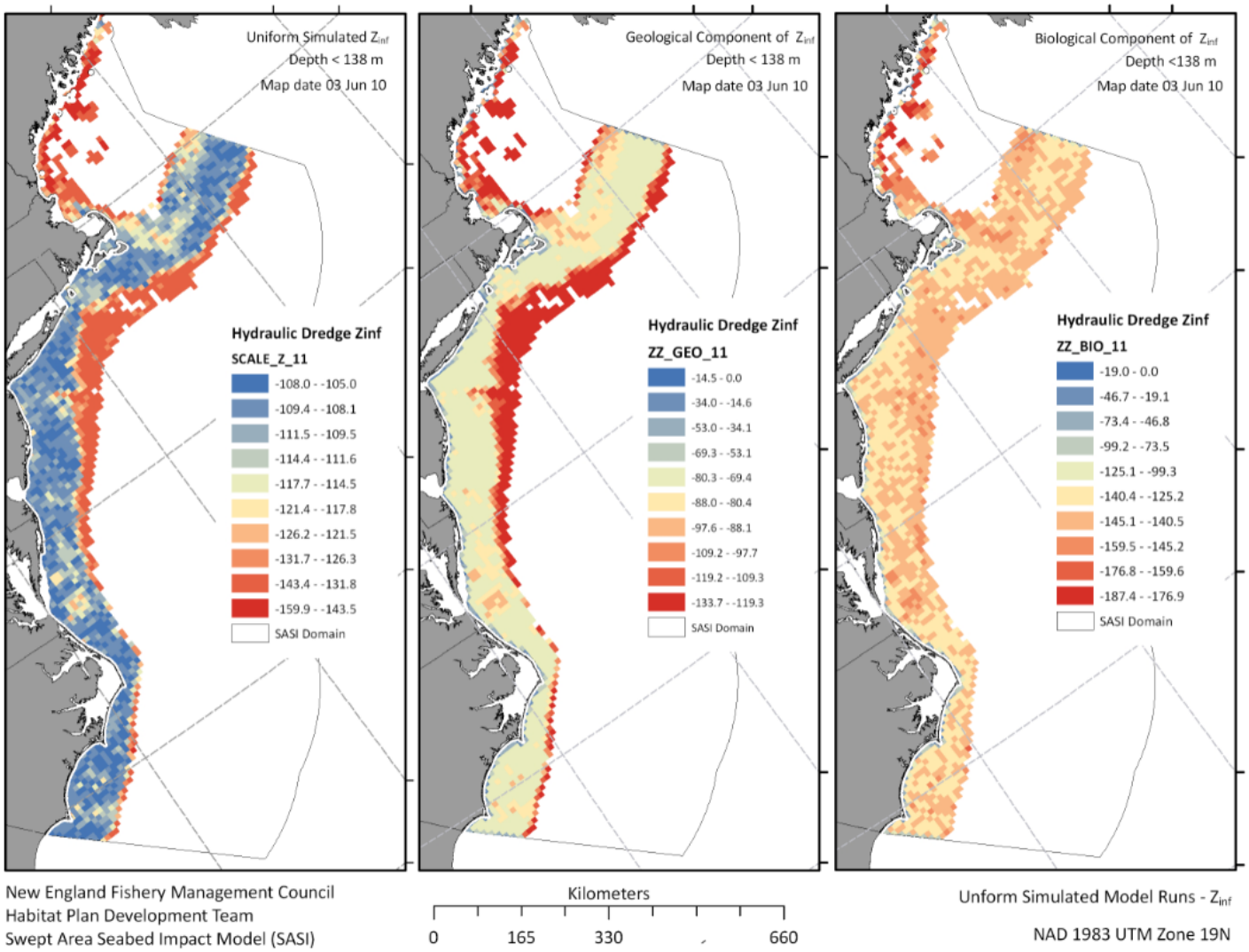


Figure 6. Simulation outputs (Z∞) for hydraulic dredge gear (left panel shows combined vulnerability of geological (mid-panel) and biological features (right-panel); blue = low vulnerability, red = high vulnerability).
Source: https://www.nefmc.org/library/omnibus-habitat-amendment-2

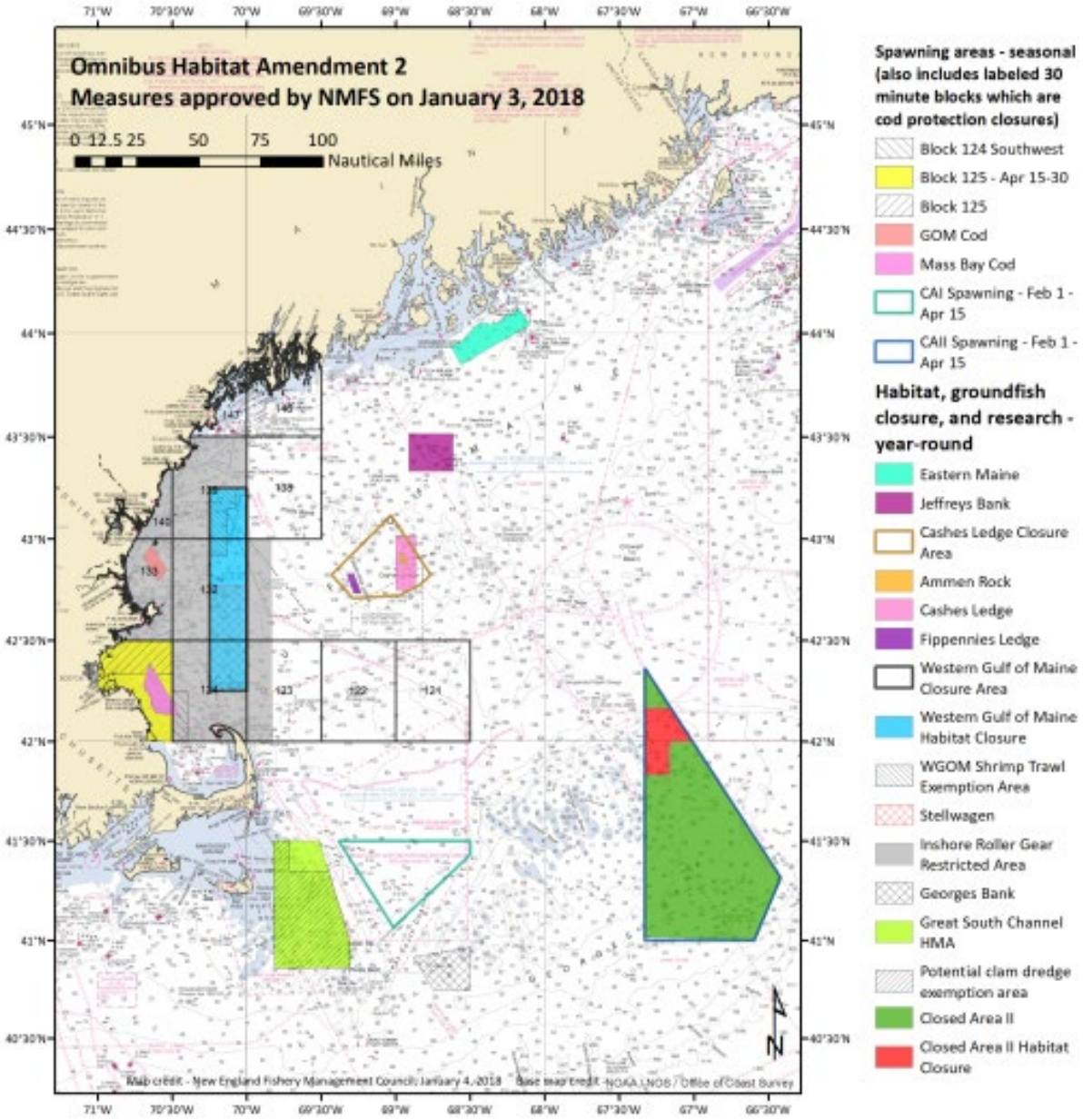


Figure 7. OHA2 approved regulations.
Source: NMFS Approves "Majority" of Council's Habitat Amendment

6.3 ESA and MMPA Protected Species

Numerous protected species inhabit the affected environment of the Atlantic Surfclam and Ocean Quahog FMP (Table 11). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972. More detailed description of the species listed in Table 11, including their environment, ecological relationships and life history information including recent stock status, are available at: https://www.fisheries.noaa.gov/region/new-england-mid-atlantic#species 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 Federal Register. 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 available information, it has been determined that this action is not likely to affect protected species (ESA-listed and/or MMPA protected; see Table 11). 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 (Palmer 2017; NMFS 2021; NMFS NEFSC observer/sea sampling database (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).

As provided in Table 11 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).

Navigational/sand mine dredging has not been found to limit the recovery of North Atlantic right whale (NMFS 2017a) 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 in 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 11. 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
Giant manta ray (*Manta birostris)*	Threatened	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.

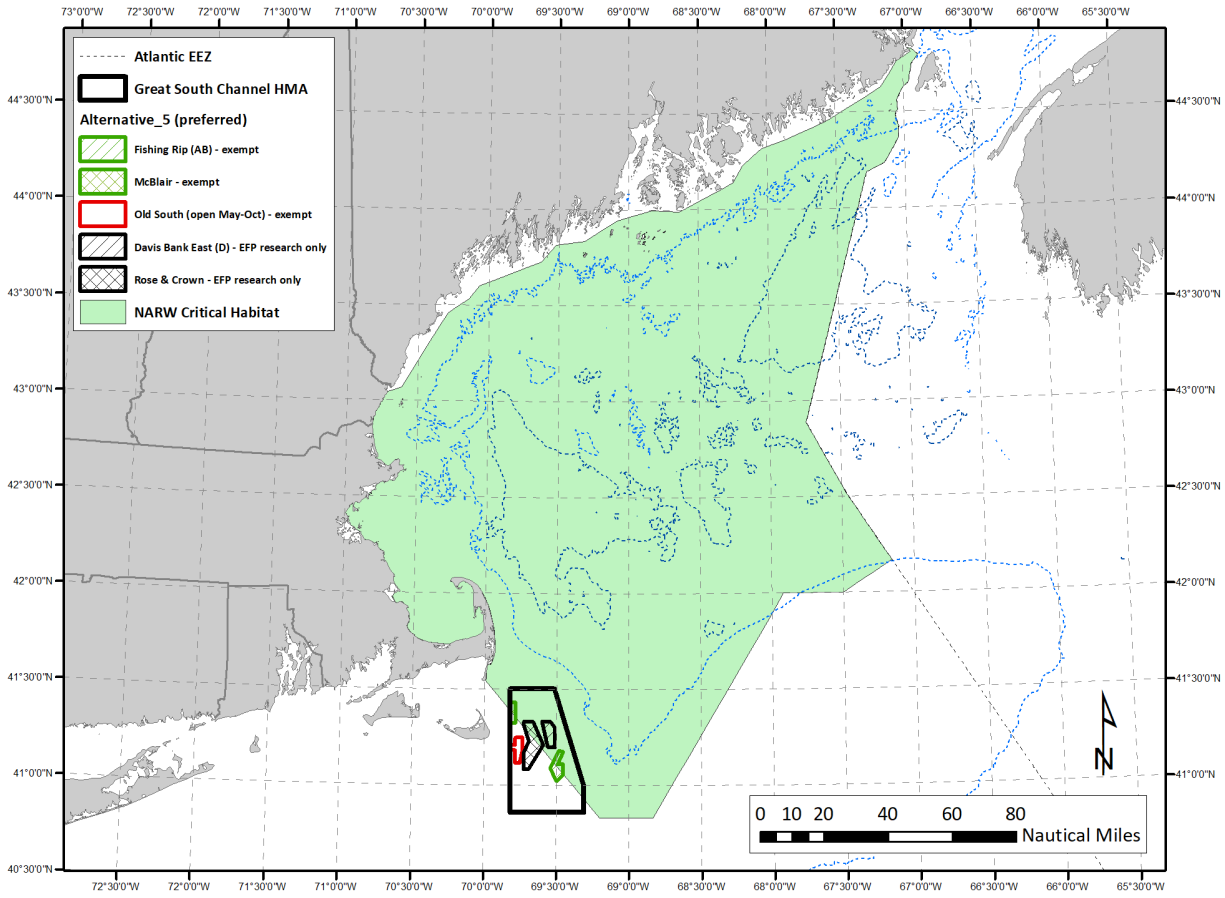


Figure 8. North Atlantic Right Whale Critical Habitat in the Gulf of Maine, GSC HMA. Additional areas of critical habitat are designated along the coasts of South Carolina, Georgia, and Florida, but are not shown here.

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, 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 (MAFMC 2018a,b). 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

The total number of vessels participating in the surfclam fishery has remained relatively stable in the recent decade (Table 12). In 2017, about 2.2 million bushels of surfclam were landed, slighlty lower than 2016 at 2.3 million bushels (Table 4). The average ex-vessel price of surfclam reported by processors was $13.90 per bushel in 2017, slightly higher than the $13.25 per bushel seen in 2016. The total ex-vessel value of the 2017 federal harvest was approximately $31 million, the same as 2016. Industry has described several factors that have affected their industry. Trips harvesting surfclam have increased in length as catch rates have declined, particularly in southern parts of the mid-Atlantic.

As indicated above, 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 of effort (LPUE) in that area was substantially higher (5-7 times higher) than in other traditional fishing grounds. NMFS 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. Subsequently, NMFS reopened an additional portion of Georges Bank beginning August 16, 2013 (78 FR 49967). Harvesting vessels have to adhere to the recently adopted testing protocol developed by the National Shellfish Sanitation Program.

6.4.1.2 Ocean Quahog

The total number of vessels participating in the ocean quahog fisheries outside the state of Maine has experienced a downward trend. 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 30 or so vessels that reported landings during 2004 and 2005 has consolidated over time into fewer vessels.

The Maine ocean quahog fleet numbers started to decline when fuel prices soared in mid-2008, and a decline in the availability of smaller clams consistent with the market demand (i.e., half-shell market), and totaled 8 vessels in 2017 (Table 12).

The average ex-vessel price of non-Maine ocean quahog reported by processors in 2017 was $7.18 per bushel, one cent higher than the 2016 price ($7.17 per bushel). In 2017, about 3.2 million

bushels of non-Maine ocean quahog were landed, slightly higher than 2016 at 3.0 million bushels. The total ex-vessel value of the 2017 federal harvest outside of Maine was approximately $23 million, slightly higher than the $22 million in 2016.

In 2017, the Maine ocean quahog fleet harvested a total of 34,550 Maine bushels, a 72% decrease from the 124,839 bushels harvested in 2006, and a 7% decrease from the prior year (2016; 37,051 bushels). Average prices for Maine ocean quahog have declined substantially over the past 15 years. 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; industry has indicated it was the result of aggressive price cutting. In 2017, the mean price was $31.15 per Maine bushel. The value of the 2017 harvest reported by the purchasing dealers totaled $1.1 million, a decrease of 78% when compared to 2003.

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 LPUE is shown in Figures 9 and 10. 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 quahog fishery, which is prosecuted with small vessels (35-45 ft) and non-hydraulic “dry” dredges. The Maine fishery is located in eastern Maine (not shown in Figures 8 and 10).

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. 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).

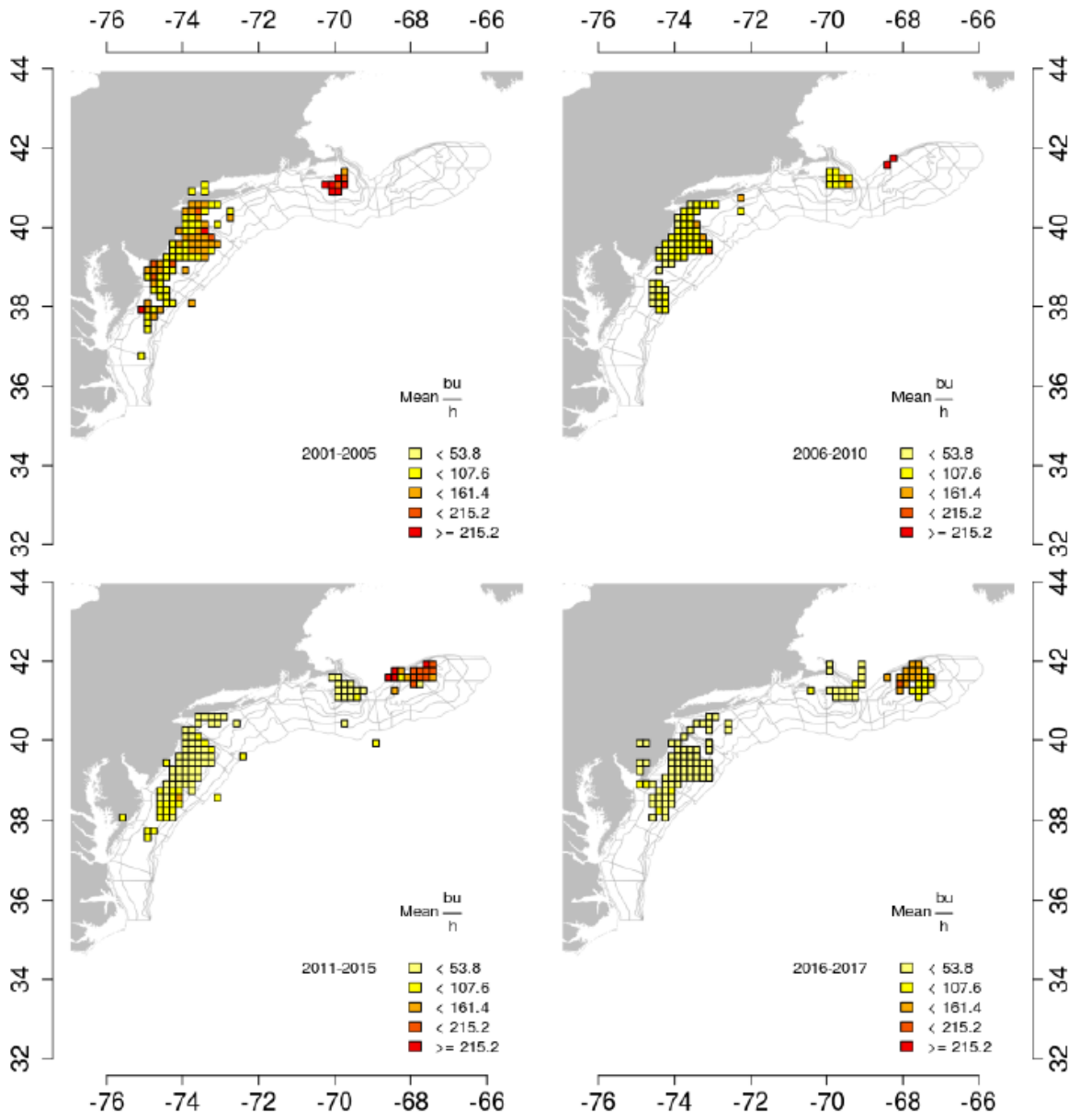


Figure 9. Average surfclam landings per unit effort (LPUE; bu h-1) by ten-minute squares over time, 2001-2016 and preliminary 2017. Only squares where more the 5 kilo bushels were caught are shown. Source: Dan Hennen Personal Communication, March 22, 2018.

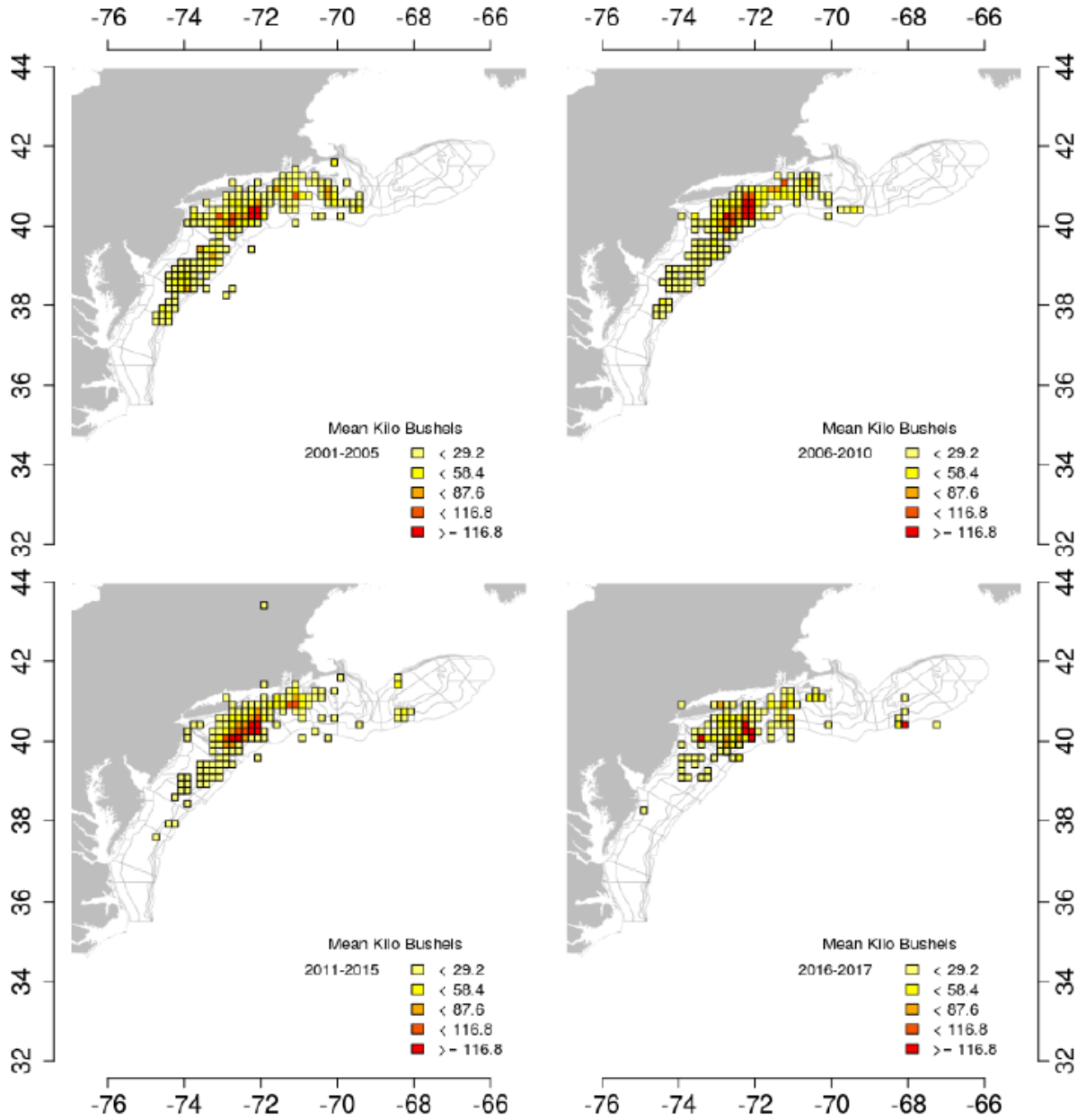


Figure 10. Average ocean quahog landings by ten-minute squares over time, 2001-2016, and preliminary 2017. Only squares where more the 5 kilo bushels were caught are shown. Source: Dan Hennen Personal Communication, March 22, 2018.

6.4.4 Vessels and Dealers

Vessels

The total number of vessels participating in the surfclam fishery has been relatively stable from 2004 through 2017, ranging from 29 vessels in 2006 to 40 vessels in 2017 (Table 12). [36] 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 20 vessels in the subsequent years. The Maine ocean quahog fleet numbers started to decline with fuel prices soaring in mid-2008 and totaled 8 in 2017 (Table 12).

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 and 2017, a handful of independent vessels (less than 5) reported landings of surfclam and ocean quahog.

Table 12. Surfclam and ocean quahog active vessels composition, 2004-2017.

Vessel-type	Harvested Species	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Non-Maine Vessels	Both surfclam & quahog	14	12	9	9	8	8	12	12	13	7	7	6	8	14
	Only surfclam	21	24	20	24	24	28	22	24	29	33	31	31	30	26
	Only quahog	15	12	9	8	10	7	9	7	6	9	9	10	9	8
	Total	50	48	38	41	42	43	43	43	48	49	47	47	47	48
Maine Vessels	Only quahog	34	32	25	24	22	19	15	13	12	11	9	8	8	8

Dealers

In 2017, there were 9 companies (i.e., dealers) reporting purchases of surfclam and/or ocean quahog from the industrial fisheries that occur outside of Maine. These 9 companies operated 15 different facilities located in multiple states. They were distributed by state as indicated in Table 13. Employment data for these specific firms are not available. In 2017, these companies bought approximately $23 million worth of ocean quahog and $31 million worth of surfclam.

[36] 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 13. Number of facilities that reported buying ocean quahog and surfclam by state (from NMFS dealer/processor report database) in 2017.

	MA	NJ	Other
Number of Facilities	8	3	4

6.4.5 ITQ Program and Market Description

Initial ITQ Allocations

The FMP to manage these fisheries was initiated in 1977. The FMP and subsequent amendments (i.e., Amendments 1 through 7) can be credited with rebuilding the surfclam stock and contributing to some economic stability in the industry. However, by the mid-1980s, rapid growth in harvesting capacity in the surfclam fishery and associated inefficiencies (e.g., vessels could only fish 36 hours per quarter) led to the development of the ITQ system (MAFMC 1988).

The initial allocations of ITQ quota share were made to owners of all permitted vessels that harvested surfclam and/or ocean quahog in the Atlantic EEZ from 1979 through 1988. In general terms, the formula for allocating surfclam in the Mid-Atlantic Area was based on average historical catch (80% of the allocation) plus a "cost factor" (20% of the allocation) based on the vessel's capacity (length x width x depth; a proxy for the owner's capital investment). For ocean quahog, the allocation was simply based on the average historical catch. This meant that the initial ITQ shares were allocated to owners of surfclam and ocean quahog vessels (MAFMC 1988).

However, there were few restrictions on transfer of quota shares or ownership in the ITQ system (MAFMC 1988). The ITQ program allows allocation owners to permanently transfer the ITQ quota share (i.e., sale, permanent transfer) or lease ITQ out (i.e., cage tag leasing, temporary annual transfer) to anyone who would qualify for a U.S. federal fishing permit, irrespective of whether they own a vessel. Since ITQs are transferable, this allows for shifts in production to participants that may be more efficient.

In the years before the surfclam and ocean quahog ITQ system was implemented, there was a build-up in the number of vessels participating in these fisheries, as vessel owners sought to build-up catch histories in order to obtain more ITQ quota share upon program implementation.[37] When the ITQ system was implemented, there were 125 vessels participating in the surfclam and ocean quahog fisheries (Färe et al. 2015).

Trends in Consolidation

The original ITQ allocations went to owners of vessels that qualified for the program. The ITQ program provided a great deal of flexibility and some of the individuals that received initial allocations of ITQ quota share sold out, while others acquired additional shares.

[37] It is also possible that the increase in vessels in an owner's fleet may have been in response to management measures limiting fishing time per vessel.

The ITQ program contained very few restraints on ownership or transfers, and as such, the program was extremely effective in rapidly eliminating economically excessive capacity (National Research Council 1999). Harvesters could consolidate their catch onto fewer vessels that could then operate at or near full capacity. A number of vessel owners, including vertically integrated processors, had assembled large fleets during the 1980s, and thus many owners were in a position to take one or more of their vessels out of the surfclam fishery to economize (McCay and Brandt 2001). Furthermore, some vessel owners took advantage of the surfclam and ocean quahog ITQ program to divest themselves of the older vessels they had accumulated during the moratorium, while other owners chose to lease their ITQ quota share to others or to leave the surfclam fishery entirely (McCay and Brandt 2001). The major decrease in the number of vessels participating in the clam fisheries occurred, as expected, at the onset of the program; although there has been a large degree of further consolidation in the last 30 years.

For the 3 years (1987-1989) prior to the implementation of the ITQ system, there were on average, 137 and 67 active vessels fishing for quota in the surfclam and ocean quahog fisheries, respectively. On average, for the 5 years after the ITQ program implementation (1990-1995), the number of active vessels participating in the surfclam fisheries decreased to 73 vessels and the number of active vessels participating in the ocean quahog fisheries increased to 76 vessels (Brinson and Thunberg 2013, 2016). Further reductions in the number of active vessels participating in these fisheries occurred through time. In 2017, there were 48 vessels participating in these fisheries combined (Table 12). One of the goals of the ITQ system in these fisheries was to reduce fleet capacity; this goal was met, as more efficient operations purchased the quota share of less efficient operations, removing redundant capital from the fisheries.

Upon the program implementation in 1990, there were 154 entities (i.e., unique surfclam allocation holders/vessel owners) that received an initial surfclam quota share. The number of entities receiving quota share decreased to 116 after the first year of implementation. The number of entities holding surfclam quota share remained relatively stable for the 1991 to 2000, ranging from 107 to 117 (Brinson and Thunberg 2013). Since 2005 the number of entities holding surfclam quota share declined from 81 (Brinson and Thunberg 2013) to 67 in 2017 (2017 Atlantic surfclam ITQ Allocation Holder Report; Source: NOAA Fisheries; listed in Appendix C).

There were 117 entities (i.e., unique ocean quahog allocation holders) that received an initial ocean quahog quota share in 1990. The number of entities receiving quota share decreased to 82 after the first year of implementation. There was a slight steady reduction from year to year in the number of entities holding quota share from 1992 (82 entities) to 2003 (62 entities; Brinson and Thunberg 2013). However, since 2004 the number of entities holding ocean quahog quota share declined from 56 (Brinson and Thunberg 2013) to 37 in 2017 (2017 Ocean Quahog ITQ Allocation Holder Report; Source: NOAA Fisheries; listed in Appendix C).

There have been other reasons for consolidation. The cost of fuel prices and the distance needed to travel to harvest clams, which cascades through the vessel, processors, ports, etc., and has put greater emphasis on economy on scale and location, leading to additional consolidation (Surfclam and Ocean Quahog Advisory Panel 2016). Other factors that have caused stress in the industry have also resulted in additional consolidation. For example, in 2005 a series of conditions resulted in a substantial portion of the industrial fleet leaving the clam fishery and greatly reduced

operations at the second-largest processor in the clam industry. Eastern Shore Seafood Products of Mappsville, Virginia was a vertically-integrated company operating both vessels and a processing plant (Northern Economics, Inc. 2019). In 2005, a deal was struck in which ownership of the plant and vessels were given over to an entity including the Truex, Meyers, Truex Group, and the Sea Watch management team. In May of 2008, the Mappsville plant ceased operations altogether and moved the processing work to other Sea Watch plants in Easton, Maryland and Milford, Delaware (Vaughn 2008).

A myriad of factors has contributed to the difficulties in the clam industry. Major users of clam meats have reduced their purchases from industry and stopped advertising products like clam chowder in the media. Industry members reported that imported meat from Canada and Vietnam contributed to an oversupply of clam meats in the marketplace. Trips harvesting surfclam have increased in length as catch rates have declined, particularly in southern parts of the mid-Atlantic. All of these factors and more have resulted in clam-related businesses becoming less profitable in recent years. Consolidation and concentration in the industry has grown as the businesses in the strongest financial condition assimilate those in the weakest position (MAFMC 2009, 2010).

Processors were not directly incorporated into the initial allocation of quota; however, processors owning permitted vessels received the allocations associated with those vessels. Some processors or processors affiliates have developed quota ownership through either the acquisition of vessels and accompanying quota or the acquisition of quota directly (Mitchell et al. 2011).

Historically, vertically-integrated firms have been involved in the surfclam and ocean quahog fisheries. Some of these were subsidiaries of multinational food corporations with fleets of a dozen or so boats; others were a family business with large fleets; and yet others were small rural processing operations with one or two boats of their own. The ability of processors to rely on their own vessels to supply raw product for their plants gave them bargaining power vis à vis the "independents" (McCay and Brandt 2001). With implementation of the ITQ program, an industry already marked by the dominance of a few large vertically integrated firms became even more so, as small-holders either sold out or chose to lease out their allocations rather than continue to fish (McCay et al. 2011).

In order for processors to meet delivery schedules set by their customers (many of which are large consumer goods companies, such as Progresso or Campbell Soup Company, or large food service companies, such as Sysco), virtually all clams are sold under contract between processors and harvesters or are harvested by processor affiliates. Processors need to be able to direct vessels to harvest at certain times, weather permitting. Given these scheduling requirements, it is not generally possible for a vessel to harvest for more than one processor and still meet the scheduling needs of the processors. Vessels must have quota at the time they harvest clams. Therefore, processors or fishers must arrange for the quota that the vessels require prior to leaving port (Mitchell et al. 2011).

Under the ITQ program, the ownership of ITQ quota share has replaced the ownership of surfclam vessels as a way to secure the supply of surfclam as raw materials. Prior to the ITQ program, only surfclam vessels with moratorium permits were allowed to harvest surfclam in the Mid-Atlantic Area, the predominant surfclam area. As a result, clam processors owned and operated surfclam

vessels to secure the supply of surfclam. However, any U.S. registered vessels are allowed to harvest surfclam under the surfclam and ocean quahog ITQ program as long as they hold surfclam ITQ quota share. Therefore, the ownership of ITQ quota share becomes the key element. In fact, some of the integrated processors have abandoned their vessel operations and focused on securing the ownership of ITQ quota share (Wang 1995).

The HHI is a commonly accepted measure of market concentration (an indicator of the amount of competition in the marketplace). The HHI takes into account the relative size distribution of the firms in a market. It approaches zero when a market is occupied by a large number of firms of relatively equal size and reaches its maximum of 10,000 points when a market is controlled by a single firm. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. According to the U.S. DOJ & Federal Trade Commission (FTC), Horizontal Merger Guidelines § 5.3 (2010), transactions that increase the HHI by more than 200 points in highly concentrated markets are presumed likely to enhance market power. [38]

NMFS data also show that the concentration of harvesting has risen substantially in the last decade, largely as the result of the backward integration of clam processors into harvesting (Mitchell et al. 2011). The processing sector itself has also changed. In 1979, there were 44 plants that processed either surfclam or ocean quahog. The HHI of purchases by processors grew between 2003 and 2008 from 2,068 to 3,134 for surfclam and from 3,431 to 4,369 for ocean quahog (Mitchell et al. 2011). Concentration has fallen somewhat after peaking in the surfclam and ocean quahog fisheries at 3,675 and 4,629, respectively, in 2007. The HHI of processor purchases for surfclam and ocean quahog combined has also grown, from 2,226 in 2003 to 3,479 in 2008. In 2017, there were nine firms operating 15 plants in multiple states (section 6.4.4).

In addition, NMFS has also conducted an analysis of quota usage by examining records showing the harvest amounts for vessels in the surfclam and ocean quahog fisheries and tracing their ownership. This analysis indicated that the HHI of harvesting activity for surfclam in 2008 was 4,080 and the HHI of harvesting activity for ocean quahog was 2,653. The HHI of harvesting activity for surfclam and ocean quahog combined was 2,890. Lastly, the HHI of ownership (quota ownership) of surfclam quota in 2009 was 1,167, and the HHI of ownership of ocean quahog quota was 993 (Mitchell et al. 2011).

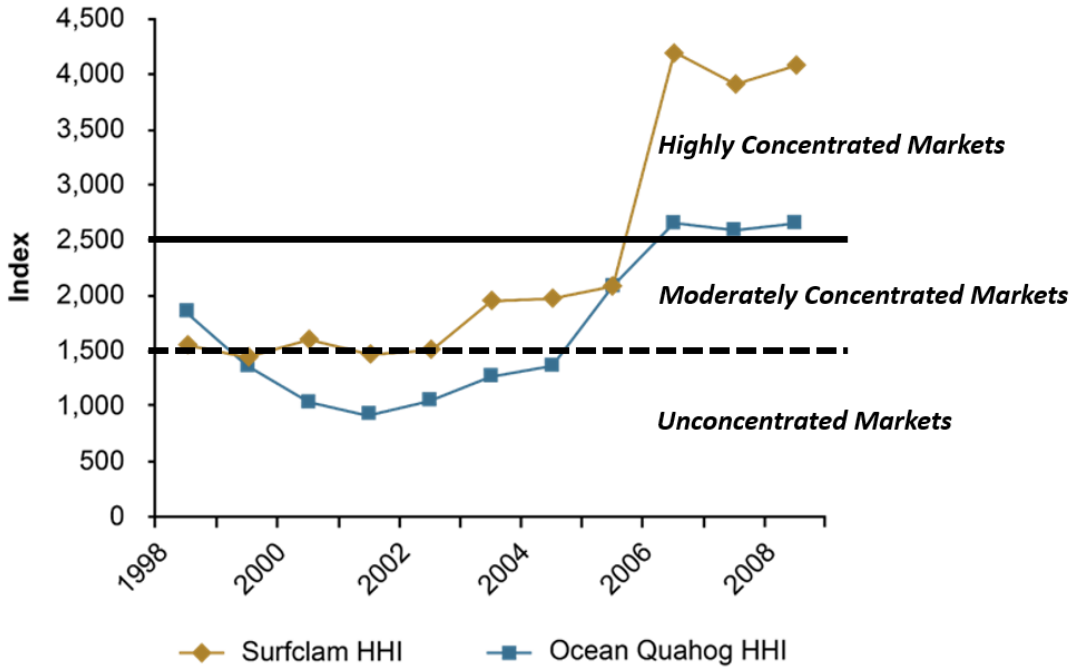
The HHI of harvesting (2006-2008) and processing (2005-2008) in the surfclam and ocean quahog fisheries estimated by NMFS (NMFS 2009) would be considered highly concentrated by the DOJ. Updated HHI values for the harvesting and processing sectors (John Walden Personal Communication, July 13, 2019) are presented in Figures 11 and 12. These figures indicate that the harvesting and processing sectors for the surfclam and ocean quahog fisheries continue to be highly concentrated (2016-2018). The processing sector HHI values for 2016-2018 were

[38] The HHI is equal to the sum of the squared market shares of the participants in the market. Thus, if there are three firms with shares of 50%, 30%, and 20%, the HHI is equal to 3,800 ($3,800 = 50^2 + 30^2 + 20^2 = 2500 + 900 + 400 = 3800$). The HHI value approaches zero when a specific market comprises a large number of similar firms, and reaches 10,000 when a market is controlled by a single firm. The HHI increases both as the number of firms in the market decreases and as the disparity in size between those firms increases. Markets in which the HHI is between 1,500 and 2,500 points are typically considered to be moderately concentrated and markets in which the HHI is in excess of 2,500 points are considered to be highly concentrated (https://www.justice.gov/atr/herfindahl-hirschman-index).

calculated using the same methods as were used through 2008. However, the harvesting sector HHI values for 2016-2018 were calculated by using an algorithm to assign vessels to ownership groups based on permit data and other publicly available data sources (John Walden Personal Communication, July 13, 2019). However, in order to identify ownership for the 2016-2018 period, vessel ownership data was used in conjunction with permit database to identify all the individuals who own one or more vessels by firm. This was the result of an improved database that provided the information in one place. In addition, online resources provided additional company and vessel information to identify vessel ownership.

The HHI values of ownership (quota ownership) for surfclam quota and ocean quahog quota were not updated. As previously stated, the Compass Lexecon Report indicated that the industrial organization information reviewed did not support a conclusion that market power (monopoly/oligopoly) is currently being exercised through withholding of quota in the surfclam and ocean quahog fisheries. While it is possible that current HHI values of quota ownership (for both surfclam quota and ocean quahog quota) are likely to be slightly higher than those reported in 2009 (see penultimate paragraph above), those values are likely to not be of concern. This is based on the maximum quota ownership values reported in Tables 2 and 3, and the considerably large 2017 number of ITQ ownership holders in both fisheries as described above.

A) 1999-2008



B) 2016-2018

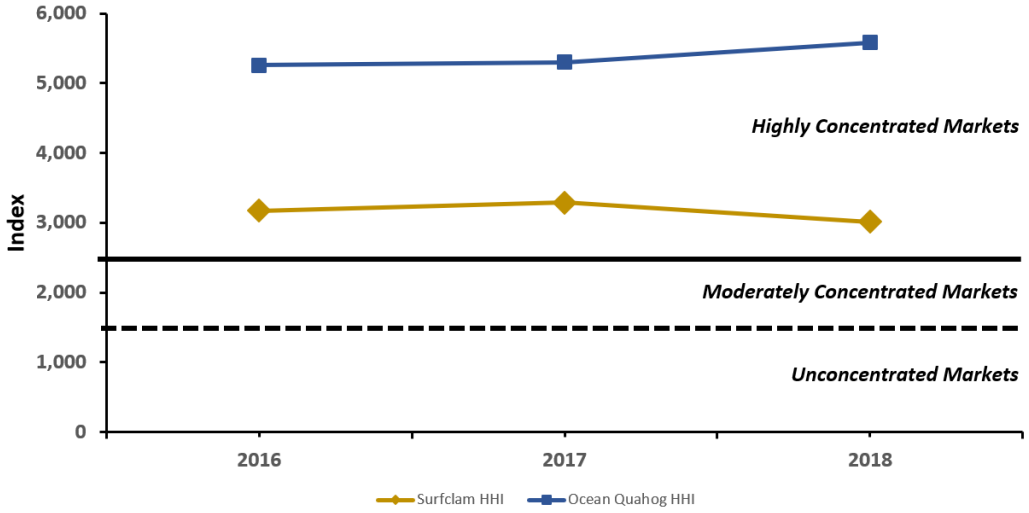


Figure 11. Herfindahl-Hirschman Index (HHI) of Market Concentration in Surfclam and Ocean Quahog Harvesting Sector, 1998-2008 (adapted from NMFS (2009)) and updated 2016-2018.

Note: As defined by DOJ, HHI values below the dashed horizontal line (1,500) shows Unconcentrated Markets; HHI values between the dashed horizontal line (1,500) and solid horizontal line (2,500) shows Moderately Concentrated Markets; HHI values above the solid horizontal line (2,500) shows Highly Concentrated Markets.

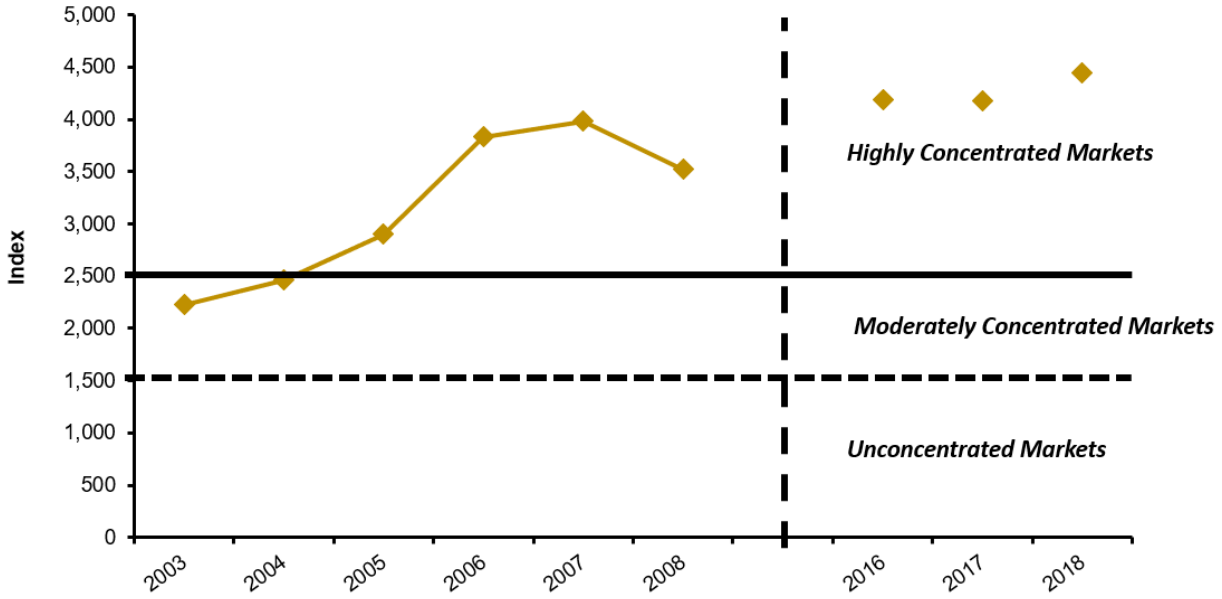


Figure 12. Herfindahl-Hirschman Index (HHI) of Market Concentration in Surfclam and Ocean Quahog Processing Sector (largely Vertically-Integrated), 2003-2008 (adapted from NMFS (2009)) and updated 2016-2018.

Note: As defined by DOJ, HHI values below the dashed horizontal line (1,500) shows Unconcentrated Markets; HHI values between the dashed horizontal line (1,500) and solid horizontal line (2,500) shows Moderately Concentrated Markets; HHI values above the solid horizontal line (2,500) shows Highly Concentrated Markets.

Brief Discussion on Market Power and Impacts on Competition

The surfclam and ocean quahog limited access privilege program (LAPP) allows for the legal transferability of the "ownership" privileges. The advantage of transferability is that it provides flexibility and incentives to shift harvesting to lower cost vessels, which improves overall profitability of the fishing fleet. Some people argue that transferability has the potential to disrupt existing industry structure and also allows for fishery participants to gain from the sale of harvesting privileges rather than to use them to harvest fish. Since harvesting privileges are given away gratis on an annual basis, individuals or firms given these privileges can profit merely by holding quota, rather than fishing.

While transferability of harvesting privileges offers many potential advantages, a concentration of ownership can lead to several different types of problems. This can include problems with market power in the final product market (monopoly: a single seller; oligopoly: a few sellers), the input market (monopsony: a single buyer; oligopsony: a few buyers) for the fishery resource, or the quota share market. These problems are not unique to fisheries under LAPPs and can occur in other sectors of the economy as well. An additional problem associated with excessive ownership is that it can lead to undesired changes in the structure of the fishing community broadly defined (NMFS 2007).

One of the most obvious market power issues is monopoly power (pricing power on the product market), that could result from accumulation of significant quota shares. The pursuit of monopoly profits will lead to artificial reduction in output in the final fishery resource (product market) or also in the quota share market and increase in prices to the consumer. However, in most instances the risk of this happening is fairly small because the product from any one LAPP must compete with similar products from domestic and international fisheries. Unless the LAPP is associated with a unique fishery product with a separate niche market, this is unlikely to become a problem (NMFS 2007). Furthermore, processors in the surfclam and ocean quahog fisheries report that in order to meet the schedules set by their customers (many of which are large consumer goods companies, such as Progresso or Campbell's, or large food service companies, such as Sysco and others), virtually all clams are sold under contract between processors and harvesters or are harvested by processor affiliates.[39] Processors also indicate that these large sophisticated buyers are able to exert significant pricing power because of their large purchases and because they have the capability to substitute imported clams for domestic clams in their products if prices warrant.[40] The threat created by the ability of major customers to use other sources of clams has the potential to limit any efforts by processors to raise prices above competitive levels, and processors report feeling the effects of this pressure from their large customers (Mitchell et al. 2011).

The Compass Lexecon Report indicated that the industrial organization information reviewed did not support a conclusion that market power (monopoly/oligopoly) is currently being exercised through withholding of quota in the surfclam and ocean quahog fisheries.[41] It is possible that under some circumstances an excessive shares cap level of 100% may be appropriate for some fisheries. However, this does not appear to be the case for the surfclam and ocean quahog fisheries ITQ system under current conditions (Mitchell et al. 2011).

The CIE review of the Compass Lexecon report indicated that more attention should be paid to the monopsony problem, which is the ability of processors to exert market power on the harvesting sector. The CIE report indicates that this may be of greater concern than the monopoly problem. The condition of TAC not binding and quota prices of zero[42] are also consistent with a monopsony scenario. Given that this is a vertically integrated industry with a small number of vessels, predominately controlled by processors, the exercise of monopsony is of primary interest and it is a larger concern than monopolization in the output market (Walden 2011).

[39] Therefore, processors do not "post" a price that they are willing to pay for clams at unloading points. There is no "spot" market for surfclam or ocean quahog (Mitchell et al. 2011).

[40] Imports of other clam species also provide a substitute for some uses (and a small portion of the domestic surfclam and ocean quahog harvest is exported). Processors report competition from imported clams from a number of countries, including Canada, Thailand, Chile, and others (Mitchell et al. 2011). Lastly, it is possible that clam meat competes with other proteins in some uses. Data are not available to rigorously evaluate whether other proteins, such as chicken or shrimp, compete with clam meat sufficiently that the prices of these substitute proteins substantially constrain the price of clam meat (Mitchell et al. 2011).

[41] The Compass Lexecon report did not analyze whether market power is exercised through the withholding of harvesting or processing, or through exclusionary conduct other than conduct involving quota ownership (Mitchell et al. 2011).

[42] Processors report that once it is clear that there will be excess quota available in a season (well before the end of the season, leaving sufficient opportunity to continue to harvest if harvesters and processors deem there to be sufficient demand), the price of quota is very low and near zero (Walden 2011, Mitchell et al. 2011).

An analysis was conducted by NMFS in 2009 to assess excessive share issues in the surfclam and ocean quahog ITQ fisheries. They found that while the ownership of ITQ quota share is mildly concentrated for surfclam ITQ quota share and unconcentrated for ocean quahog ITQ quota share, the use of quota is highly concentrated. The concentration of harvesting has risen substantially during the ITQ program largely as the result of the backward integration of processors into harvesting and the proliferation of long-term contracts among ITQ quota share owners, vessel owners, and processing firms.

As a result of this increase in vertical integration and in long-term contracts, processors now have direct or indirect control over the use of the majority of ITQ quota share in the surfclam and ocean quahog fisheries (NMFS 2009). NMFS examined the possibility that control over such a large amount of ITQ quota share is leading to lower prices paid to independent vessels for their harvest. A formal tests for oligopsony power (few buyers) by surfclam and ocean quahog processors was not done in the analysis conducted by the NMFS in 2009. They presented both landings and ex-vessel price trends, but did not draw any conclusions about why these trends are occurring. However, the 2009 NMFS report indicated that over the past 40 years, net exit has occurred in both the harvest and processing sectors for a variety of reasons. For example, some of the major factors may have included:

1) declines in resource biomass of both species, particularly off southern states and in waters closer to shore
2) declining catch rates for surfclam beginning in 2001
3) lack of access to the surfclam and ocean quahog resources on Georges Bank due to PSP
4) increasing costs of vessel operation, particularly fuel and insurance
5) changing the federal fisheries management program from effort-based regulations to individual transferable quotas. Decoupling harvest rights from vessels allowed unneeded vessels to exit the fisheries
6) industry's shift to using larger vessels with greater capacity necessitates fewer of them.

For the processing sector, factors that may have led to fewer firms include:

1) decreased resource availability (as with the vessel sector)
2) changing consumer tastes for clam products
3) the high capital costs of modern clam plants
4) and perhaps most importantly, the high cost of equipment required to comply with stricter wastewater discharge regulations which resulted in many plants shutting down.

Taken together, these have led to the vertically integrated industry and the oligopsony market for surfclam and ocean quahog which now exists according to the NMFS report.

Lastly, an additional type of problem that can result from concentration of ownership has to do with the lifestyle of fishing households and fishing communities. There could be significant philosophical support for the maintenance of a fishery composed of many diverse individuals. According to this opinion, even if concentration will not produce market power problems, it is something to be avoided for its own sake. However, this trade-off in economic returns from the fishery resource to maintain a social or community structure is a policy and prioritization question the Councils must sort through (NMFS 2007).

Total Allocations Being Fished

Table 14 shows surfclam and ocean quahog cage tag utilization by small and large allocation owners for the 2004-2006 and 2017 periods. In 2017, 35.7% of the surfclam quota was unused. The number of unused unique allocations for surfclam (based on 67 allocation holders) was 5, about 7%. For ocean quahog in 2017, 40.9% of the quota was unused. The number of unused unique allocations for ocean quahog (based on 37 allocations holders) was 15, about 41%. Of those allocation holders using their tags, 64% of surfclam and 59% of ocean quahog tags were used.

In the ocean quahog fishery, the proportion of cage tags not used is higher for small allocation owners when compared to large allocation owners for 2004-2006 and 2017. In the surfclam fishery, the proportion of cage tags not used is higher for small allocation owners when compared to large allocation owners for all years except 2017. In 2017, the small allocation owners left 11% of their cage tags unharvested, while large allocation owners did not use 39% of their cage tags. However, a closer look at the surfclam allocation ownerships for 2017, indicated that a large number of small allocation owners may also be owners of large allocations via partnerships and other complex contracting and business practices that are prevalent in the fisheries. It is possible that some of the owners that have both, small and large surfclam allocations, may be harvesting the tags associated with their small allocations first before utilizing the tags associated with their larger allocations. For the years evaluated, the percentages of unused cage tags for small and large allocations owners tend to be relatively closer to each other when larger proportions of the available quotas are harvested.

Transfer of Allocations

In these fisheries both permanent and temporary transfers occur. Temporary transfers can only be tracked annually and occur for many reasons. Bank lenders hold approximately 1/5 of the allocations; so, temporary transfers of tags by bank lenders and between related and unrelated business and corporate entities are frequent. In 2016, 41% of the surfclam tags and 26% of the ocean quahog tags were temporarily transferred (Northern Economics, Inc. 2019).

Table 14. Atlantic surfclam and ocean quahog allocation usage for 2004-2006 and 2017.

Year	Quota (million bushels)	Landings (million bushels)	% of quota unused	Total # allocations issued	Total # allocations that did not use any cage tags	Allocation owner by size*	% of total quota owned	# cage tags issued	# cage tags used	% cage tags unused
Surfclam										
2004	3.400	3.138	7.7%	84	2	Small Owners (43)	17.5%	18,641	17,068	8.4%
						Large Owners (41)	82.5%	87,614	80,821	7.8%
2005	3.400	2.744	19.3%	82	6	Small Owners (42)	18.2%	19,389	15,519	20.0%
						Large Owners (42)	81.8%	86,893	71,136	18.1%
2006	3.400	3.057	10.1%	82	7	Small Owners (41)	17.6%	18,731	13,381	28.6%
						Large Owners (40)	82.4%	87,551	81,347	7.1%
2017	3.400	2.186	35.7%	67	5	Small Owners (33)	11.7%	12,430	11,226	9.7%
						Large Owners (34)	88.3%	93,852	57,338	38.9%
Ocean Quahog										
2004	5.000	3.890	22.2%	56	9	Small Owners (28)	3.3%	5,146	3,172	38.4%
						Large Owners (28)	96.7%	150,887	116,887	22.5%
2005	5.333	3.006	43.6%	56	19	Small Owners (28)	3.3%	5,483	2,460	55.1%
						Large Owners (28)	96.7%	160,944	131,036	18.6%
2006	5.333	3.147	41.0%	56	23	Small Owners (28)	3.3%	5,483	2,253	58.9%
						Large Owners (28)	96.7%	160,944	94,231	41.5%
2017	5.333	3.149	40.9%	37	15	Small Owners (18)	4.0%	6,626	3,363	49.2%
						Large Owners (19)	96.0%	159,738	93,972	41.2%

*Allocations were considered to be “Small” or “Large” by sorting them from the smallest number of bushels to the largest, and then using the median to break them into two groups.

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).

The quotas and landings levels and the percent of quota landed from 1980-2017 for surfclam and ocean quahog are shown in Figures 13 and 14, respectively. 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 (2008-2017), surfclam production has been below the quota. 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 Figures 13 and 14. Surfclam landings in 2017, reached a record low at 2.2 million bushels, the lowest landings level since the ITQ system was implemented which also corresponds to the lowest quota utilization (percentage of quota landed). In the last fifteen years, a downward trend in landings of surfclam is observed (Figure 13).

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% or more of the ocean quahog quota landed. In the last fifteen years (2003-2017), a downward trend in landings of ocean quahog is observed (Figure 14). Ocean quahog landings in 2017, were 3.1 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.

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, 2010, 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.

In 2017, there were companies that reported purchases of surfclam and/or ocean quahog from the industrial fisheries that occur outside of Maine. These 9 companies operated 15 different facilities located in various states. These companies have facilities in multiple states (section 6.4.4). 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.

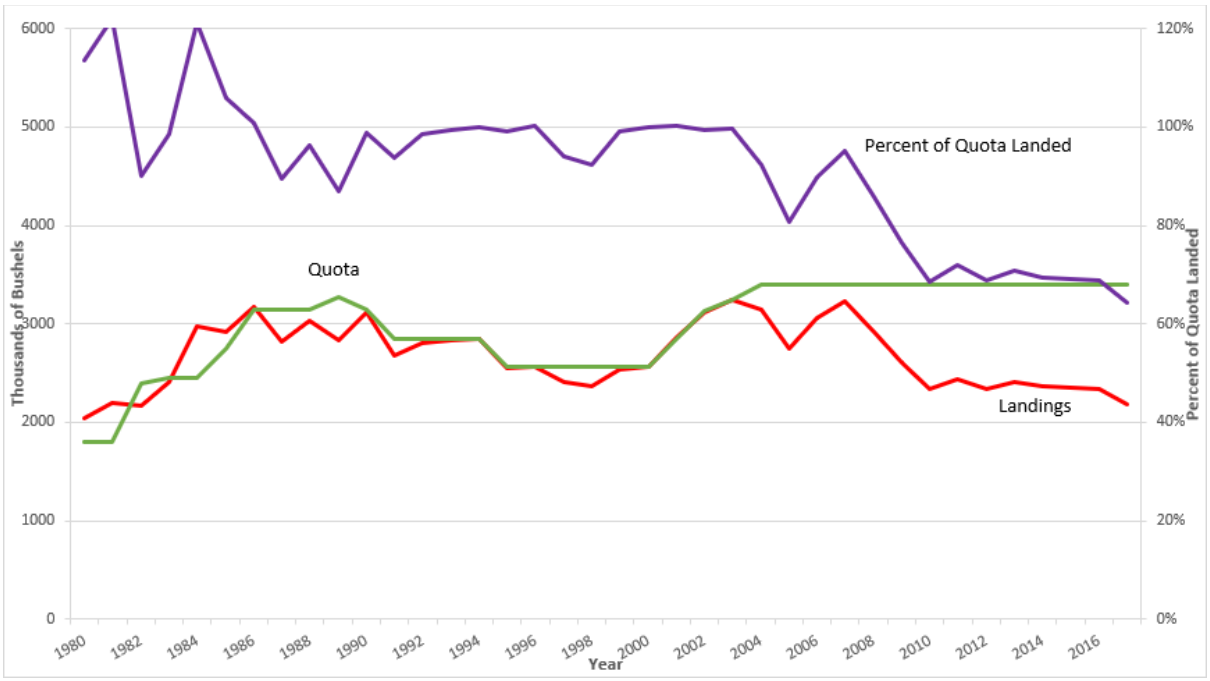


Figure 13. Surfclam landings, quotas, and percent of quotas landed, 1980-2017.
Source: NMFS Clam Vessel Logbook Reports. Dan Hennen Personal Communication, March 22, 2018.

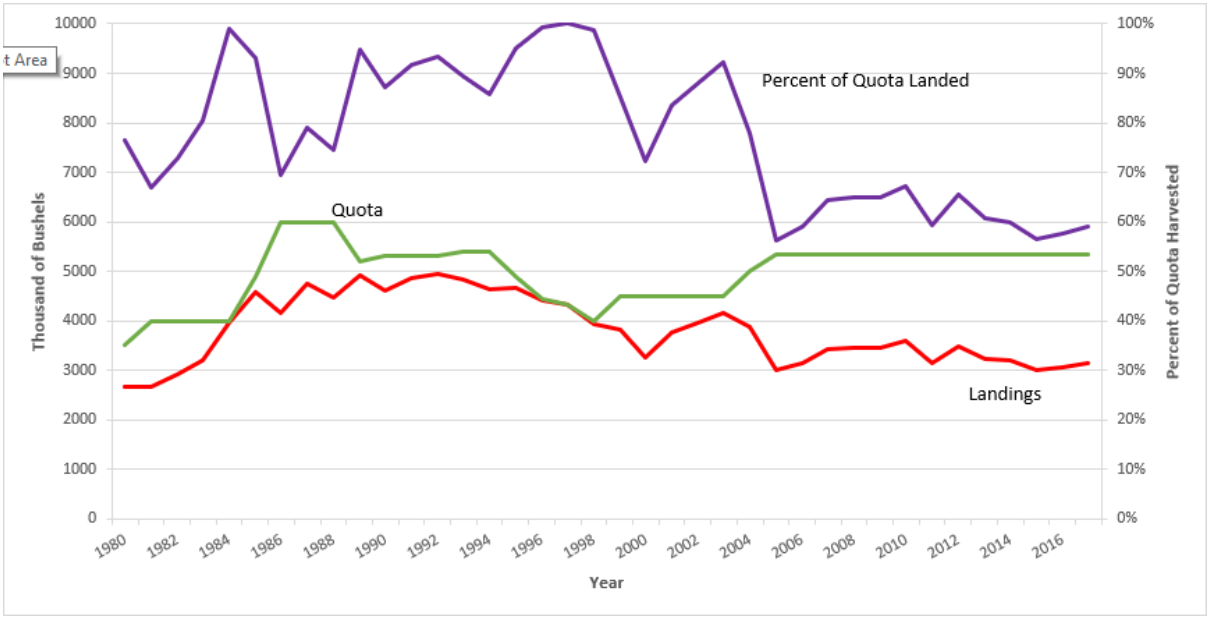


Figure 14. Ocean quahog landings, quotas, and percent of quotas landed, 1980-2017.
Source: NMFS Clam Vessel Logbook Reports. Dan Hennen Personal Communication, March 22, 2018.

Ex-vessel Revenues and Prices

Figures 15 to 18 show ex-vessel revenues and prices for surfclam and ocean quahog in nominal and real values. As previously indicated (see Trends in Consolidation Section), a series of conditions resulted in a substantial portion of the industrial fleet leaving the clam fishery in 2005. In addition, increasing foreign competition and limited markets have resulted in decrease in landings (see Landings, Quota Utilization, and Market Trends Section). However, nominal ex-vessel prices remained relatively stable during that last 10-15 years (Figures 17 and 18).

After the large surfclam ex-vessel revenue decrease in 2005, ex-vessel revenues increased to the 2003 levels, and then had a decreasing trend through 2010 (Figure 15). From 2010 through 2017, surfclam ex-vessel revenues show a slight upward trend despite low quota utilization (Figure 13) and significant decrease in the efficiency of harvesting operations (Figure 19). Ex-vessel prices for surfclam have been relatively stable for the 2010 through 2017 period with slight increases in more recent years (Figure 17).

Ex-vessel prices for both species were relatively flat for the 2003 to 2007 period. In 2008, there was a slight increase in the price for both species that is likely related to the large increase in fuel costs in 2008, processors reported levying fuel surcharges on their customers for at least some period of time to cover increased harvesting costs. Ex-vessel prices for both species show a steady upward trend from 2009-2017 (Figures 17 and 18).

However, Figures 17 and 18, show that the mean real prices (adjusted prices) for both species have shown a downward trend for the 2003-2017 time period. While these trends by themselves yield no real answers about market power, taken together with increasing production prices, they do suggest that vessels were likely not improving their economic position.

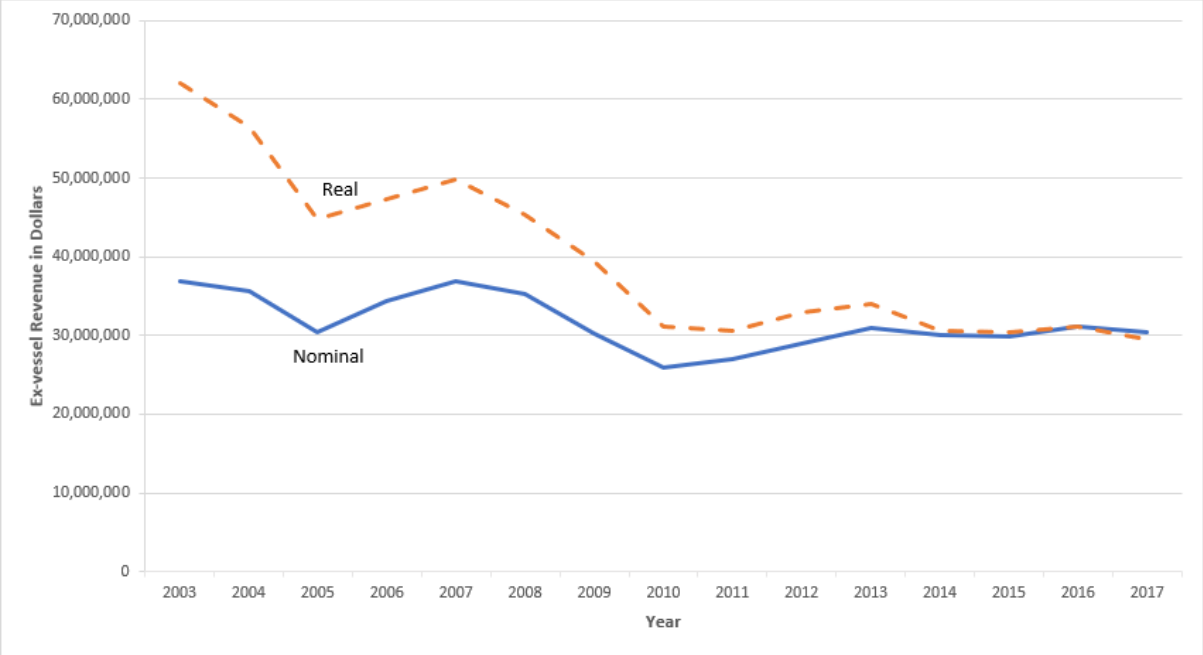


Figure 15. Surfclam ex-vessel revenue, 2003-2017.
Source: Dealer data, NMFS. The Producer Price Index (PPI) was used to convert nominal dollars to 2016 dollars for unprocessed and package fish, which includes shellfish and fish.

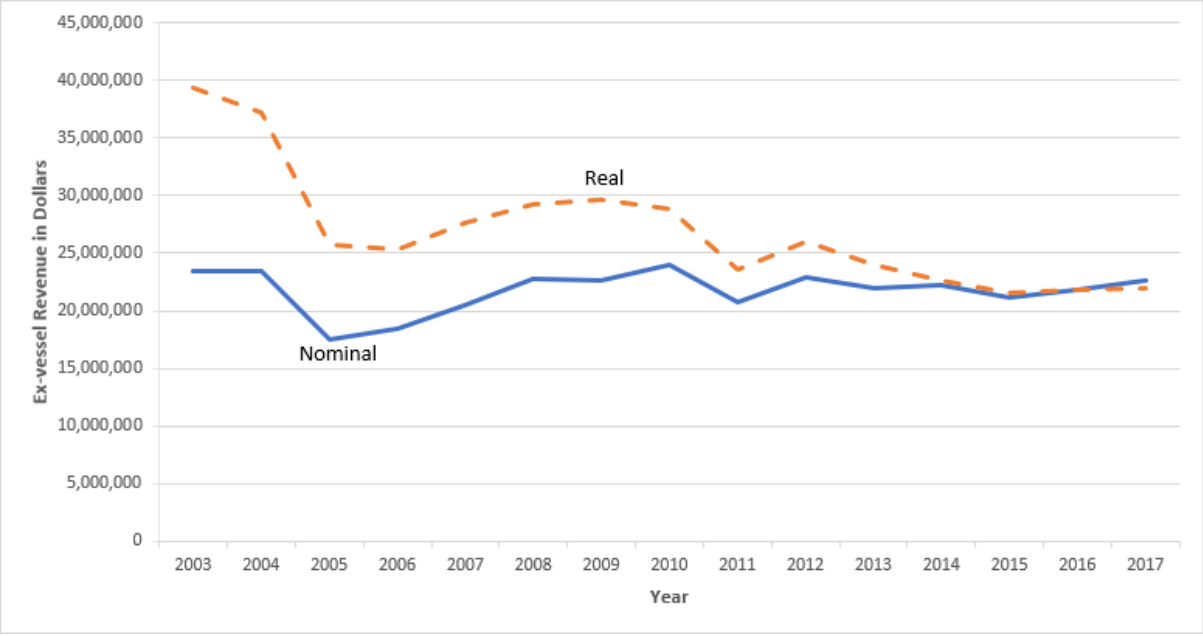


Figure 16. Ocean Quahog ex-vessel revenue, 2003-2017.
Source: Dealer data, NMFS. The Producer Price Index (PPI) was used to convert nominal dollars to 2016 dollars for unprocessed and package fish, which includes shellfish and fish.

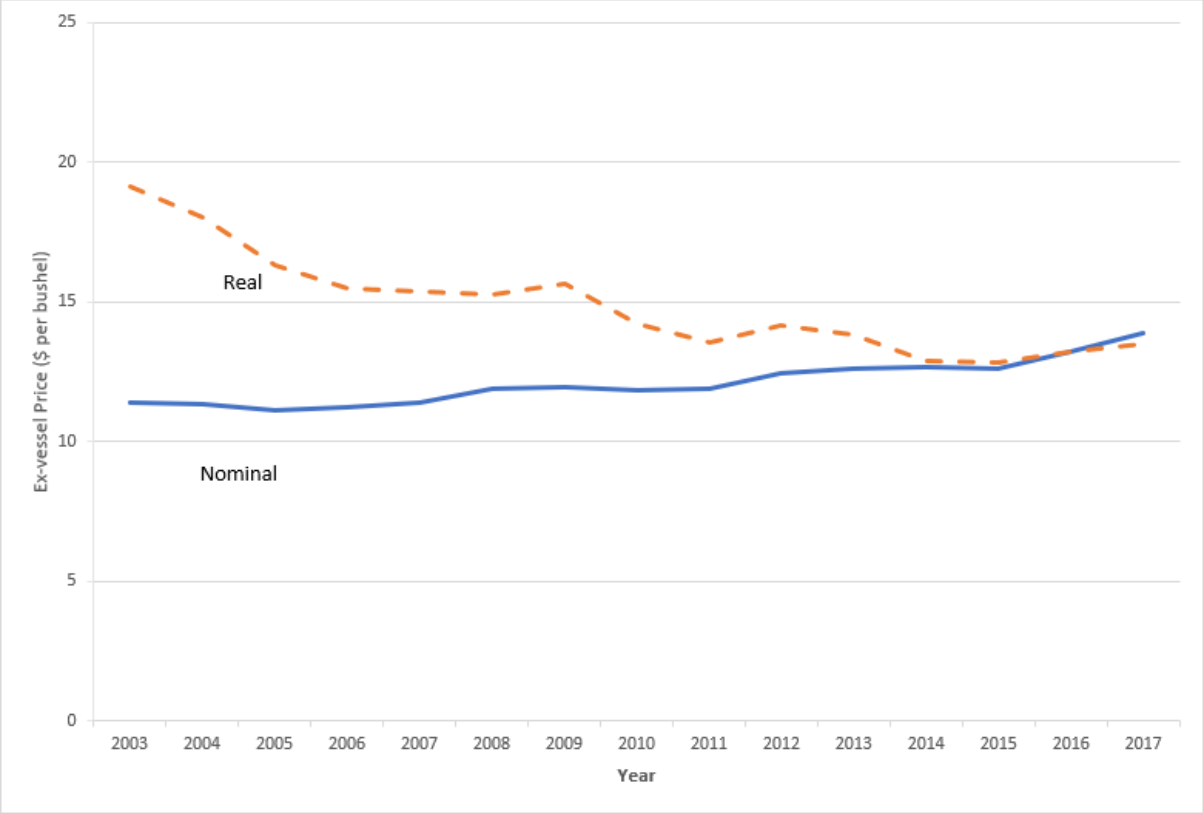


Figure 17. Surfclam ex-vessel price ($/bu), 2003-2017.
Source: Dealer data, NMFS. The Producer Price Index (PPI) was used to convert nominal dollars to 2016 dollars for unprocessed and package fish, which includes shellfish and fish.

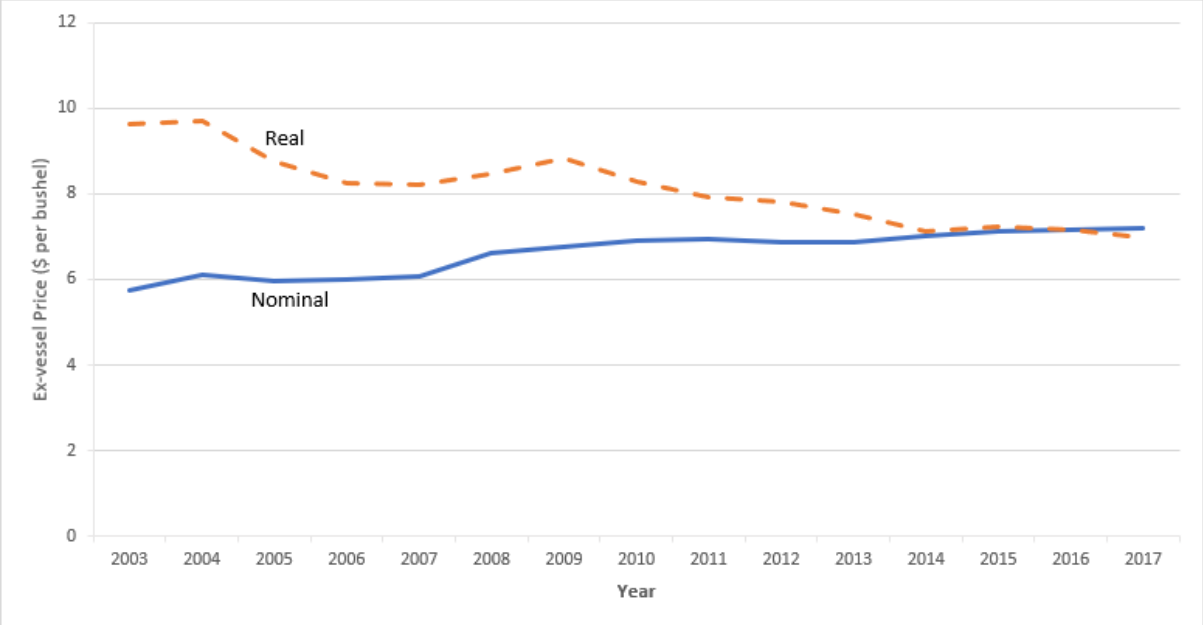


Figure 18. Ocean quahog ex-vessel price ($/bu), 2003-2017.
Source: Dealer data, NMFS. The Producer Price Index (PPI) was used to convert nominal dollars to 2016 dollars for unprocessed and package fish, which includes shellfish and fish.

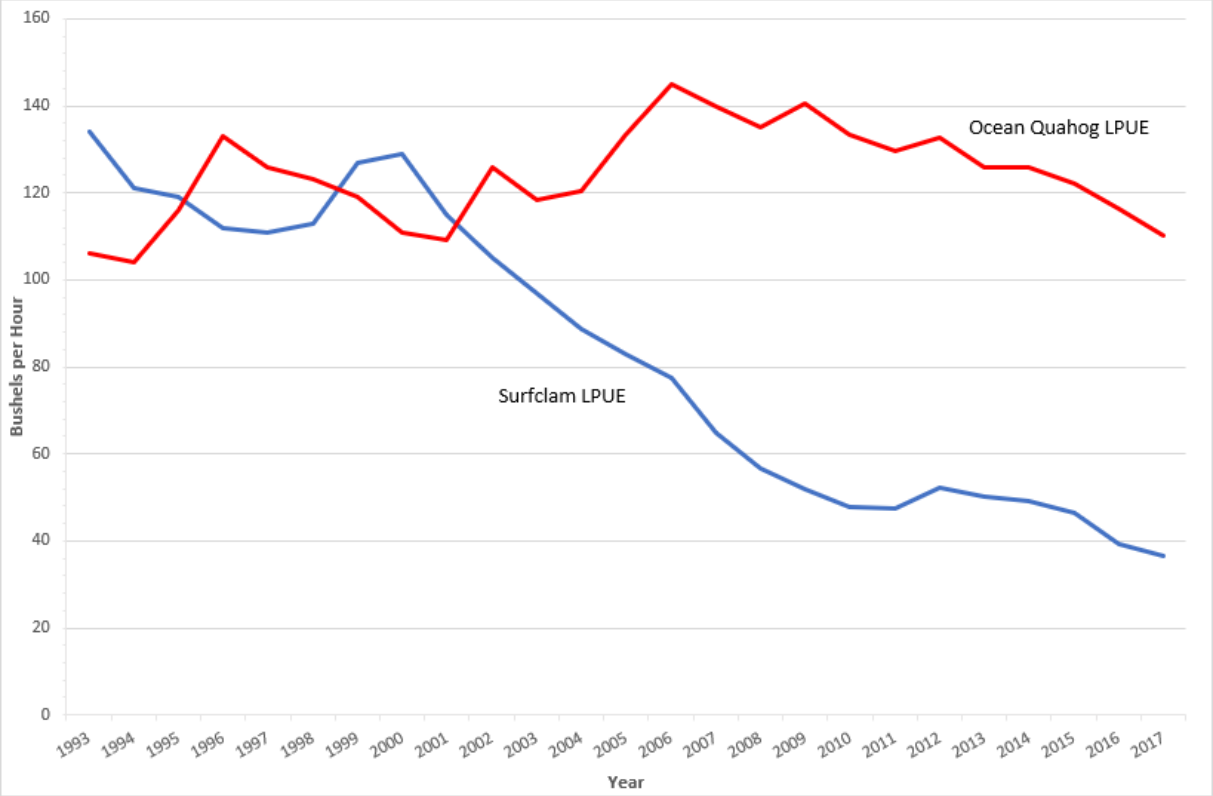


Figure 19. Surfclam and ocean quahog landings per unit effort (LPUE), 1993-2017.
Source: NMFS Clam Vessel Logbook Reports.

Economic Performance - Harvesting Sector

Prior to the implementation of the ITQ program, excess harvesting capacity (overcapitalization) was a major problem and led to closures very quickly due to effort/time restrictions. In fact, the excess capacity was such, that it was believed that an increase in the annual quota within the range that at that time constituted optimum yield would not have alleviated this problem but could have further encouraged the existing vessels to increase vessel capacity through gear modifications (MAFMC 1988).

Given the large economic inefficiencies resulting from the overcapitalization of the fleet, the harvesting, and processing industries which depend upon them, were only marginally profitable. Furthermore, during the pre-ITQ period, the composition of the entire fleet shifted to larger vessels (MAFMC 1988). Larger vessels harvest more output per unit of input (on site). However, under effort management restrictions that constrained the time that vessels could fish for surfclam, both, small and large vessels harvested similar quantities of surfclam. As such, overall, larger vessels employed more fuel, labor, and capital services per unit of output when compared to smaller vessels. The benefit of larger unit output per unit of allocated inputs once the vessel has reached a fishing site were not realized under effort time/time restrictions (Weninger and Strand 2003).

In theory, an important benefit of ITQ systems are efficiency gains that may result from the implementation of property rights. Walden et al. (2012) pointed out that under an ITQ system, vessels with the lowest harvesting costs can expand their catch by buying or leasing quota share

from other, higher-cost vessels, leading to lower overall harvest costs and more efficient outcomes for society.

Theoretically, under the ITQ system, each harvester is able to use the lowest cost combination of fishing inputs (e.g., fuel, labor, materials) since they are allocated an exclusive share of the annual quota. In other words, they are incentivized to harvest the resource in a manner that is most efficient, and therefore, maximizing profits for their fishing operations as well as the industry as a whole.

Productivity is a key economic indicator at the household, firm, industry and national levels, and is a critical factor in economic growth (Färe, Grosskopf, and Margaritis 2008 cited in (Walden et al. 2014)). A productivity index can be used to measure the combined effects of changes in inputs and outputs in a fishery. More specifically, a productivity index can be used to describe how landings from fishing vessels and input to produce those landings change through time. This indicator is of importance because changes in productivity are directly tied to changes in profit. As an example, if prices for the clams landed are stable, and the inputs (such as fuel used on a fishing trip) do not change, profits can increase if vessels are able to produce more landings (outputs) for a given level of inputs.

Productivity changes in the surfclam and ocean quahog ITQ fisheries have been conducted by various researchers. Walden et al. (2014) conducted an evaluation of productivity change for all catch share fishery programs in the U.S. and Thunberg et al. (2015) measured changes in multi-factor productivity in U.S catch share fisheries. Multi-factor productivity (MFP) change is a measure of changes in quantities of inputs used to harvest fish and outputs produced. Changes in the MFP can be used to capture multiple dimensions of economic change associated with catch share programs (e.g., changes in product value and mix, costs, and efficiency) in a single metric through time.

MFP may improve either by harvesting more fish with the same amount of inputs or by harvesting the same amount of fish using fewer inputs. It is expected that by ending the "race to fish" catch share programs may lead to improved productivity through the ability to better plan harvesting activities to change the mix of outputs and/or make better use of capital and other inputs. Furthermore, productivity gains may also be obtained through the transfer of quota from less to more efficient vessels (Walden et al. 2012).

Since changing resource conditions can influence output, the values reported by Walden et al. (2014) and Thunberg et al. (2015) were adjusted using a Lowe index to account for changes in biomass to estimate MFP. For a detailed treatment of methods and data see Walden et al. (2014) and Thunberg et al. (2015).

Walden et al. (2014) concluded that over the long-term, the biomass adjusted MFP (MFP is defined as a ratio of aggregate outputs to aggregate inputs) has remained above the pre-ITQ period baseline (1987-1989) in the surfclam fishery from 1990 through 2012 (the last year evaluated in the analysis). On a yearly basis, the biomass-adjusted productivity increased until 2003, then declined during the last eight years of the time period (Figure 20). Beginning in year 2000, the input index started to increase, indicating that more inputs were being used to harvest the quota. This outcome

is consistent with a declining biomass. When the stock declines and becomes more dispersed spatially, vessels will need to employ more inputs to harvest the same amount of output.

For ocean quahog, the adjusted multi-factor productivity was above the pre-ITQ baseline for 19 of 23 years (Walden et al. 2014). The value of 1.82 in year 2012 indicates that the fishery was 82% more productive in 2012 than in the base line period. Most of the years showed slight increases or decreases in yearly productivity (Figure 20). The largest increase was 21% in 2005 (1.21; year-to-year MFP change), while the largest decline was 13% in 2000 (0.87). For the entire period, the average year-to-years change was 3% (1.03).

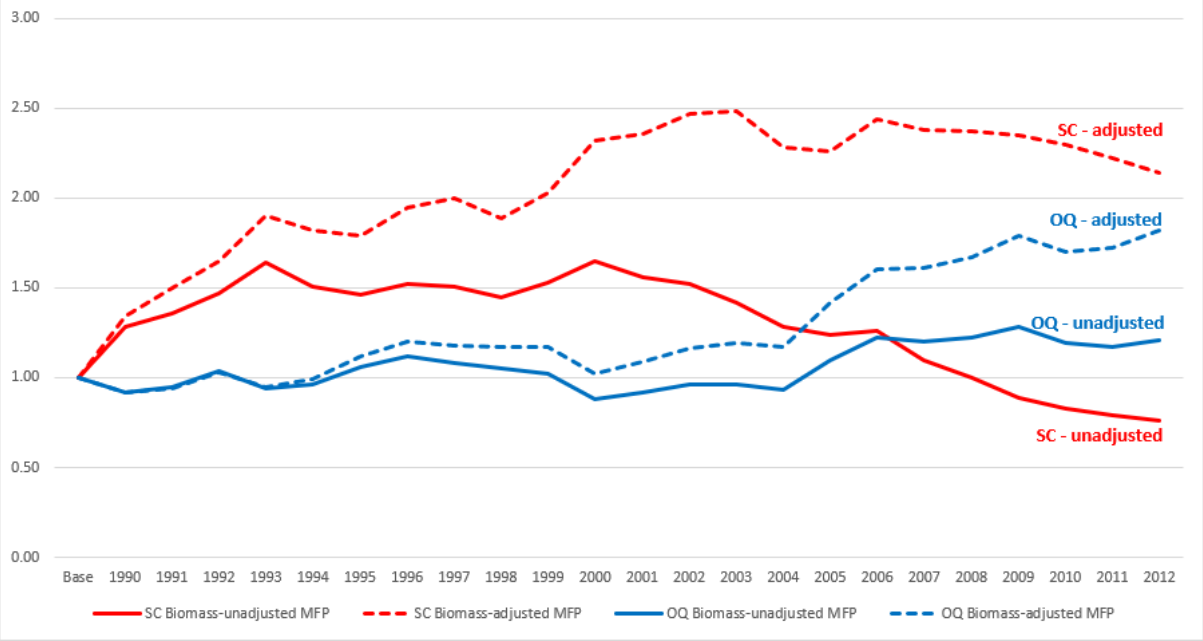


Figure 20. Biomass-adjusted and biomass-unadjusted marginal factor productivity for surfclam and ocean quahog, base period (1987-1989) and 1990-2012.

Brinson and Thunberg (2016) employed the Gini coefficient to measure changes in the distribution of the use of quota in terms of catch share revenue among active vessels for several catch share programs. These authors indicated that the trends in the Gini coefficient over time and not the absolute value are important in assessing evenness or equality. A Gini coefficient of 0 means that catch share revenues are the same for all active vessels, while a value approaching 1 means that catch shares revenues are highly concentrated in a single or among a small number of vessels. A decreasing Gini coefficient is indicative of increasing evenness or equality in catch share revenues, whereas an increasing Gini coefficient indicates decreasing evenness, or its opposite increasing inequality among participating vessels.

The Gini coefficient for surfclam during the first year of the ITQ program implementation was 0.37 (1990), a 16% increase from the 1987-1990 baseline period (0.32). The Gini coefficient has been steadily increasing since the surfclam ITQ system was implemented and reached a value of 0.50 in 2013 (the last year evaluated by the authors). For ocean quahog, the Gini coefficient was 0.51 during the baseline period and it decreased to 0.48 during the first year of the ITQ program implementation, and then steadily increased to 0.61 for most of the early 1990s to early 2000s. In

2013, the Gini coefficient for the ocean quahog fishery was 0.59 (Table 15). The overall performance analysis (assessing sets of all indicators developed) for 16 catch share programs evaluated by Brinson and Thunberg (2016) indicated that in general terms the accumulation of ownership share may be less of a concern than consolidation in the use of quota, which includes the use of quota by entities as well any quota leased from other share owners.

Table 15. The Gini coefficient for the surfclam and ocean quahog catch share programs.

Catch Share Program	Baseline period (average 1987-1989)	Year 1 (1990)	Average years 1-3 (1990-1993)	Average years 1-5 (1990-1994)	Last 5 year average (2009-2013)	2013
Surfclam	0.32	0.37	0.45	0.46	0.49	0.50
Ocean Quahog	0.51	0.48	0.61	0.61	0.61	0.59

Source: Brinson and Thunberg (2016).

ITQ Program Review

The Council contracted Northern Economics, Inc. to develop a report for the review of the surfclam and ocean quahog ITQ program. NOAA Catch Share Policy prepared in 2010 indicates that periodic reviews are expected of all catch share programs (CSPs), regardless of whether the program is a LAPP or when it was put in place. The review conducted by Northern Economics, Inc. fulfilled the program review requirements as described in the guidance for catch share reviews (NMFS 2017b). The review was completed and submitted to NMFS in June 2019 following a public comment period, and available at: http://www.mafmc.org/council-events/june-2019-council-meeting; "Briefing Materials (Tab 2)."

7.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This Environmental Assessment (EA) analyzes the expected impacts of each alternative on each VEC. When considering impacts on each VEC, the alternatives are compared to the current condition of the VEC. The alternatives are also compared to each other. The No Action alternatives describe what would happen if no action were taken. For all options considered in this document, the "no action" alternative would have the same outcomes as *status quo* management, therefore, these alternatives are at times described as "no action/*status quo*."

Environmental impacts are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). Table 16 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 five years, as well as the economic characteristics of the fisheries over the most recent three to five 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 17.

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

Excessive Share Alternatives

- Alternative 1: No Action/*Status Quo* – No limit on or definition of an excessive share is included in the FMP
- Alternative 2: Single Cap – Quota share ownership cap-only with unlimited possession of cage tags allowed during the fishing year
  - Sub-Alternative 2.1: Quota share ownership cap based on highest level in the ownership data, 2016-2017
  - Sub-Alternative 2.2: Quota share ownership cap at 49%
  - Sub-Alternative 2.3: Quota share ownership cap at 95%
- Alternative 3: Cap – Applies to possession of both owned quota share and cage tags
  - Sub-Alternative 3.1: Cap based on highest level of tag possession in the ownership and transfer data, 2016-2017
  - Sub-Alternative 3.2: Cap at 40%
  - Sub-Alternative 3.3: Cap at 49%
- Alternative 4: Two-Part Cap Approach – A cap on quota share ownership and a second, higher cap based on possession of cage tags
  - Sub-Alternative 4.1: Two-part cap based on highest level in the ownership data, 2016-2017
  - Sub-Alternative 4.2: Two-part cap based on highest level in the ownership data, 2016-2017, plus 15% added to the maximum levels to allow for additional consolidation
  - Sub-Alternative 4.3: Quota share ownership cap at 30% and cage tag cap at 60%
  - Sub-Alternative 4.4: Preferred – Two-part cap – Quota share ownership cap and a second, higher annual allocation cap based on possession of cage tags; Surfclam: 35/65% and Ocean quahog: 40/70%
- Alternative 5: Quota share ownership cap-only at 40% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota
- Alternative 6: Quota share ownership cap-only at 49% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota

Excessive Shares Review Alternatives

- Alternative 1: No Action/*Status Quo* – There are no requirements for review of implemented excessive shares measures
- Alternative 2: Preferred – Require periodic review of excessive shares measures that the Council adopts at specific intervals. At least every 10 years or as needed

Framework Adjustment Process Alternatives

- Alternative 1: Preferred – No Action/*Status Quo* – No changes to the current list of measures that can be addressed under the framework adjustment process
- Alternative 2: Add excessive shares cap level to the list of measures to be adjusted via framework

Multi-Year Management Measures Alternatives

- Alternative 1: No Action/*Status Quo* – No changes to the process to set surfclam and ocean quahog management specifications for up to 3 years

- Alternative 2: Preferred – Specifications to be set for maximum number of years needed to be consistent with the Northeast Regional Coordinating Council (NRCC)-approved stock assessment schedule

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 does not propose any modifications to other management or regulatory components (e.g., annual quota, minimum size, reporting requirements) and as such are not expected to affect the commercial fisheries in a manner that would change the impacts for any of the VECs considered.

In general, alternatives which may result in overfishing or an overfished status for target and non-target species may have negative biological 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 16).

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 16). In addition, alternatives that result in continued fishing effort may result in slight negative impacts. 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). 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.

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 endangered or threatened species, any action that results in interactions with or take of those species or stocks 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 with protected species (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 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 16). 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 impacts are considered in relation to potential changes in landings and prices, and by extension, revenues, compared 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. In addition, measures that would curtail entities from exerting market power and therefore not decreasing competition would have positive socioeconomic impacts. Lastly, measures that would result in community disruptions as a result of additional consolidation (e.g., decrease in the number of independent harvesters, decrease in employment) would have negative socioeconomic impacts.

Excessive consolidation, in an economic context, is the level that moves the competitive condition in the market from one of pure competition to a situation where one or more firms can exert power in the output market (monopoly/oligopoly), or input market (monopsony/oligopsony). In the case of a quota market, it is one where we move from a condition of many buyers and sellers, to one where only a few buyers and sellers exist. In a social context, it is level that results in a less diverse population of participants in the harvesting or processing sectors of the fishery, or that impedes the continued participation of small-vessels, owners/operators, and entry-level participants. Excessive consolidation can occur at the geographic level or at the harvesting and processing sectors of the fisheries.

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. However, the excessive shares cap level alternatives presented in this document or the other alternatives analyzed (i.e., excessive shares measures review; framework adjustment process; and multi-year management measures) are purely administrative 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 proposed action is not expected to result in changes to the manner in which surfclam and ocean quahog fisheries are prosecuted.

Table 16. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline) summarized in Table 17 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 17. 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)	**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, alewife, and blueback herring 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. Pursuant to Section 118 of the MMPA, the Large Whale Take Reduction Plan was implemented to reduce humpback, North Atlantic right, and fin whale entanglement in vertical lines associated with fixed fishing gear (sink gillnet and trap/pot) and sinking groundlines.	
	Small cetaceans	Pilot whales, dolphins, and harbor porpoise are all protected under the MMPA. Pursuant to Section 118 of the MMPA, the Harbor Porpoise Take Reduction Plan and Bottlenose Take Reduction Plan was implemented to reduce bycatch of harbor porpoise and bottlenose dolphin stocks, respectively, in gillnet gear.	
	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. 2017 estimated ex-vessel revenues were $31 and $23 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 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. In 2017, there were 67 surfclam and 37 ocean quahog allocations owners at the beginning of the fishing year. A total of 48 vessels were active in these fisheries in 2017, including a handful of independent vessels (less than 5).	

7.1 Impacts of the Alternatives on Atlantic Surfclam and Ocean Quahog and Non-Target Species

7.1.1 Excessive Shares Cap Alternatives

Under alternative 1 (no action/*status quo*), no limit on or definition of excessive shares accumulation is included in the FMP. As such, the current management approach to address excessive shares in the surfclam and ocean quahog ITQ fisheries would continue. This alternative would leave the FMP out of compliance with the provisions of the MSA, as the Act requires that a process be established to define what constitutes excessive shares (section 4.0). The no action alternative is expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. The no action alternative is expected to have no impact (direct or indirect) on the target species (managed species). Alternative 1 is expected to have the same impacts (no impacts) on target species as alternatives 2-6 described below.

The no action alternative is not expected to impact non-target species caught in the surfclam and ocean quahog commercial fisheries. All of the species most commonly caught on directed clam trips have positive stock status, except for moon snails which are unassessed. As indicated above, the prosecution of the surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices are not expected to change under this alternative. Therefore, the no action alternative is expected to have no impact on interaction of these fisheries with non-targeted species. Alternative 1 is expected to have the same impacts (no impacts) on non-target species as alternatives 2-6 described below.

Alternatives 2-6 are administrative in nature and strictly consider a variety of approaches to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges.[43] These alternatives are expected to have no impact on the prosecution of these surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices. Alternatives 2-6 are expected to have no impacts (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog commercial fisheries. Relative to each other, and alternative 1 (no action), alternatives 2-6 would have neutral impacts on both target species, and non-target species.

7.1.2 Excessive Shares Review Alternatives

The alternatives discussed in this section are expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices.

Under alternative 1 (no action/*status quo*), there would not be a requirement for periodic review of the excessive shares measures. The no action alternative is expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam

[43] Sub-alternative 4.4, under alternative 4 is the Council-preferred alternative. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership.

and ocean quahog commercial fisheries. Alternative 1 is expected to have the same impacts as alternative 2 (Council-preferred alternative).

Alternative 2 is administrative in nature and would require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed. Alternative 2 is expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog commercial fisheries. Alternative 2 would have impacts on target species and non-target species that are the same as those under alternative 1.

7.1.3 Framework Adjustment Process Alternatives

The alternatives discussed in this section are expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices.

Under Council-preferred alternative 1 (no action/*status quo*), the list of management measures that have been identified in the FMP that could be addressed via framework adjustment process would not change (i.e., maintain the *status quo* list of measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap level to be modified via the framework adjustment process. The Council selected alternative 1 as the preferred alternative because they were concerned that allowing changes to the numeric cap value of a specific "excessive shares cap level" may be better addressed under an amendment process and not a frameworkable action (as it would be allowed under alternative 2). Some Council members and stakeholders indicated that changes to "cap values" under a frameworkable action may not allow for sufficient stakeholder input, especially if it is developed as a fast track action. The no action alternative is expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog commercial fisheries. Alternative 1 is expected to have the same impacts as alternative 2.

Alternative 2 is administrative in nature and strictly considers the expansion of the list of framework adjustment measures that have been identified in the FMP. This alternative would add adjustments to the excessive shares cap level to the list of frameworkable actions in the FMP. This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap). Alternative 2 is expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog fisheries. Alternative 2 would have impacts on target species and non-target species that are the same as those under alternative 1.

7.1.4 Multi-Year Management Measures Alternatives

The alternatives discussed in this section are expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices.

Under alternative 1 (no action/*status quo*), there would be no changes to the process to set surfclam and ocean quahog management specifications for up to 3 years. The no action alternative is expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog commercial fisheries. Alternative 1 is expected to have the same impacts as alternative 2.

Alternative 2 (Council-preferred) is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Under alternative 2, specifications could be set for up to the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule. Specifications under the multi-year process described in alternative 2 would include all the environmental impact review procedures currently required under the MSA, and other applicable laws, including NEPA. These review procedures collectively ensure that impacts on fisheries resources be considered prior to implementation of the proposed harvest levels. In addition, under this alternative, Council staff will coordinate with NEFSC staff, during the first quarter of each year (during the multi-year specifications period) to assess if there is any information regarding these fisheries that needs to be brought to the attention of the SSC and Council. Alternative 2 is expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog fisheries. Alternative 2 would have impacts on target species and non-target species that are the same as those under alternative 1.

Although there are no impacts on the VECs, alternative 2 would provide for substantial administrative efficiencies by reducing the need to create and implement multiple specification documents to set management measures for the fisheries between stock assessments (i.e., efficient use of Council and NOAA staff time supporting the management process; thus, reducing staff time and management cost).

7.2 Impacts of the Alternatives on the Physical Habitat

As described in section 7.0, 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. As described in section 7.1, the alternatives discussed in this section are expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices.

7.2.1 Excessive Shares Cap Alternatives

Under alternative 1 (no action/*status quo*), no limit on or definition of excessive shares accumulation is included in the FMP. As such, the current management approach to address excessive shares in the surfclam and ocean quahog ITQ fisheries would continue. The no action alternative is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 1 is expected to have the same impacts (no impacts) on habitat, including EFH as alternatives 2-6 described below.

Alternatives 2-6 are administrative in nature and strictly consider a variety of approaches to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges.[44] Alternatives 2-6 are expected to have no impacts (direct or indirect) on habitat, including EFH. Relative to each other, and alternative 1 (no action), alternatives 2-6 would have neutral impacts on habitat, including EFH.

7.2.2 Excessive Shares Review Alternatives

Under alternative 1 (no action/*status quo*), there would not be a requirement for periodic review of the excessive shares measures. The no action alternative is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 1 is expected to have the same impacts as alternative 2 (Council-preferred alternative).

Alternative 2 is administrative in nature and would require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed. Alternative 2 is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 2 would have impacts on habitat, including EFH that are the same as those under alternative 1.

7.2.3 Framework Adjustment Process Alternatives

Under Council-preferred alternative 1 (no action/s*tatus quo*), the list of management measures that have been identified in the FMP that could be addressed via the framework adjustment process would not change (i.e., maintain the *status quo* list of measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap level to be modified via the framework adjustment process. The no action alternative is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 1 is expected to have the same impacts as alternative 2.

Alternative 2 is administrative in nature and strictly considers the expansion of the list of framework adjustment measures that have been identified in the FMP. This alternative would add adjustments to the excessive shares cap level to the list of frameworkable actions in the FMP. This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap). Alternative 2 is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 2 would have impacts on habitat, including EFH that are the same as those under alternative 1.

7.2.4 Multi-Year Management Measures Alternatives

Under alternative 1 (no action/s*tatus quo*), there would be no changes to the process to set surfclam and ocean quahog management specifications for up to 3 years. The no action alternative is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 1 is expected to have the same impacts as alternative 2.

[44] Sub-alternative 4.4, under alternative 4 is the Council-preferred alternative. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership.

Alternative 2 (Council-preferred) is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Under alternative 2, specifications could be set for up to the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule. Specifications under the multi-year process described in alternative 2 would include all the environmental impact review procedures currently required under the MSA, and other applicable laws, including NEPA. These review procedures collectively ensure that impacts on fishery resources be considered prior to implementation of the proposed harvest levels. In addition, under this alternative, Council staff will coordinate with NEFSC staff, during the first quarter of each year (during the multi-year specifications period) to assess if there is any information regarding these fisheries that needs to be brought to the attention of the SSC and Council. Alternative 2 is expected to have no impact (direct or indirect) on habitat, including EFH. Alternative 2 would have impacts on habitat, including EFH that are the same as those under alternative 1.

7.3 Impacts of the Alternatives on Protected Resources

7.3.1 Excessive Shares Cap Alternatives

Under alternative 1 (no action/s*tatus quo*), no limit on or definition of excessive shares accumulation is included in the FMP. As such, the current management approach to address excessive shares in the surfclam and ocean quahog ITQ fisheries would continue and therefore, the no action alternative is expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices. Based on this information, and the fact that there have never been documented interactions between protected species (ESA-listed and/or MMPA protected) and the primary gear type (i.e., clam dredge) used to prosecute the fisheries, Alternative 1 is not expected to adversely affect any protected species provided in Table 11 (section 6.3). For these reasons, the no action alternative is expected to have no impact on ESA-listed and/or MMPA-protected resources. Relative to alternatives 2-6, alternative 1 would have neutral impacts to protected species.

In addition, as described in section 7.1, the actions considered under alternatives 2-6 are administrative in nature and strictly consider a variety of approaches to ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges.[45] These alternatives are expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices. Based on this information, and the fact that there have never been documented interactions between protected species (ESA-listed and/or MMPA protected) and the primary gear type (i.e., clam dredge) used to prosecute the fisheries, alternatives 2-6 are not expected to adversely affect any protected species provided in Table 11 (section 6.3). For these reasons, alternatives 2-6 are expected to have no impacts (direct or indirect) on ESA-listed and/or MMPA-protected resources. Relative to each other, and alternative 1, alternatives 2-6 would have neutral impacts on protected species.

[45] Sub-alternative 4.4, under alternative 4 is the Council-preferred alternative. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership.

7.3.2 Excessive Shares Review Alternatives

As described above (under excessive shares cap alternatives), there have never been documented interactions between protected species (ESA-listed and/or MMPA protected) and the primary gear type (i.e., clam dredge) used to prosecute the surfclam and ocean quahog fisheries. None of the alternatives discussed in this section are expected to impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices. The impact determinations of the excessive shares review alternatives on ESA-listed and/or MMPA-protected resources are based on this information.

Under alternative 1 (no action/s*tatus quo*), there would not be a requirement for periodic review of the excessive shares measures. The no action alternative is expected to have no impact (direct or indirect) on ESA-listed and/or MMPA-protected resources. Alternative 1 is expected to have the same impacts as alternative 2 (Council-preferred alternative).

Alternative 2 is administrative in nature and would require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed. Alternative 2 is expected to have no impact (direct or indirect) on ESA-listed and/or MMPA-protected resources. Alternative 2 would have impacts on protected species that are the same as those under alternative 1.

7.3.3 Framework Adjustment Process Alternatives

As described above (under excessive shares cap alternatives), there have never been documented interactions between protected species (ESA-listed and/or MMPA protected) and the primary gear type (i.e., clam dredge) used to prosecute the surfclam and ocean quahog fisheries. None of the alternatives discussed in this section are expected to impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices. The impact determinations of the framework adjustment process alternatives on ESA-listed and/or MMPA-protected resources are based on this information.

Under Council-preferred alternative 1 (no action/s*tatus quo*), the list of management measures that have been identified in the FMP that could be addressed via the framework adjustment process would not change (i.e., maintain the *status quo* list of measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap level to be modified via the framework adjustment process. The no action alternative is expected to have no impact (direct or indirect) on ESA-listed and/or MMPA-protected resources. Alternative 1 is expected to have the same impacts as alternative 2.

Alternative 2 is administrative in nature and strictly considers the expansion of the list of management measures that have been identified in the FMP that can be implemented or adjusted at any time during the year. This alternative would add adjustments to the excessive shares cap level to the list of frameworkable actions in the FMP. This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap). Alternative 2 is expected to

have no impact (direct or indirect) on ESA-listed and/or MMPA-protected resources. Alternative 2 would have impacts on protected species that are the same as those under alternative 1.

7.3.4 Multi-Year Management Measures Alternatives

As described above (under excessive shares cap alternatives), there have never been documented interactions between protected species (ESA-listed and/or MMPA protected) and the primary gear type (i.e., clam dredge) used to prosecute the surfclam and ocean quahog fisheries. None of the alternatives discussed in this section are expected to impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, distribution of fishing effort, or fishing methods and practices. The impact determinations on ESA-listed and/or MMPA-protected resources are based on this information.

Under alternative 1 (no action/s*tatus quo*), the current management approach addressing surfclam and ocean quahog multi-year management specifications would continue. The no action alternative is expected to have no impact (direct or indirect) on ESA-listed and/or MMPA-protected resources. Alternative 1 is expected to have the same impacts as alternative 2.

Alternative 2 (Council-preferred) is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Under alternative 2, specifications could be set for up to the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule. Specifications under the multi-year process described in alternative 2 would include all the environmental impact review procedures currently required under the MSA, and other applicable laws, including NEPA. These review procedures collectively ensure that impacts on fishery resources be considered prior to implementation of the proposed harvest levels. In addition, under this alternative, Council staff will coordinate with NEFSC staff, during the first quarter of each year (during the multi-year specifications period) to assess if there is any information regarding these fisheries that needs to be brought to the attention of the SSC and Council. Alternative 2 is expected to have no impact (direct or indirect) on ESA-listed and/or MMPA-protected resources. Alternative 2 would have impacts on protected species that are the same as those under alternative 1.

7.4 Impacts of the Alternatives on Human Communities (Socioeconomic Impacts)

7.4.1 Excessive Shares Cap Alternatives

Under alternative 1 (no action/s*tatus quo*), no limit on or definition of excessive shares accumulation is included in the FMP. Therefore, no specific limit or definition of an excessive share is included in the FMP as required under National Standard 4 of the MSA. Under this alternative, the current management approach to address excessive shares would continue.

Amendment 8 to the FMP states that it relies on antitrust laws already in force which would cover the abuse of excessive shares (MAFMC 1988). The Council's intent under Amendment 8 was to have NMFS monitor the concentration of ITQ (as ITQ owners have to apply to NMFS to transfer ITQ) and if it seemed that excessive consolidation was occurring, they would advise the U.S. DOJ which would determine if antitrust laws were being violated (Joel McDonald Personal

Communication, July 16, 2017). However, this monitoring of quota shares could not occur. This is because the creation of new business entities (e.g., LLC's, etc.) with ITQ ownership, and the lack of a regulatory mechanism to identify corporate officers or business partnerships across individuals or entities involved in ITQ ownership hampered the ability to determine whether there was a concentration of quota ownership, and whether competitive conditions were being eroded in the quota share market over time.

During the development of alternatives for this amendment, staff at the Council and GARFO (including General Council) spoke to the Antitrust Division of the DOJ about the role that they might play in the monitoring of excessive shares in the surfclam and ocean quahog fisheries. The DOJ indicated that their Business Practice Process does provide pre-enforcement review and advisory options for certain select transactions. However, the type of scenarios for which the Business Review Process[46] has been used in the past have been for much larger, economically significant deals between companies than is envisioned by the Excessive Shares Amendment.[47]

This alternative would leave the FMP out of compliance with the provisions of the MSA, as the Act requires that a process be established to define what constitutes excessive shares (section 4.0), and a means to track and monitor ownership relative to that definition is needed.

As previously described in section 6.4.5, the Compass Lexecon Report indicated that the industrial organization information reviewed did not support a conclusion that market power is currently being exercised through withholding of quota in the surfclam and ocean quahog fisheries. The qualitative evidence reviewed in the Compass Lexecon Report indicates that is unlikely that market power is being exerted in the product market (monopoly/oligopoly) in these fisheries.

In addition, it is argued that the availability of substitutes is the most important of the factors listed in determining the elasticity of demand[48] for a specific commodity (Leftwich 1973; Awk 1988). Seafood demand in general appears to be elastic (NMFS 2007). In fact, for most species, product groups, and product forms, demand is elastic (Asche and Bjørndal 2003). There are many substitutes for most fish products, including other types of fish and sources of protein from other animals (NMFS 2007). When demand is highly elastic, and substitutes are amply available, small changes in price lead to large changes in the quantity demanded. The large reductions in output caused by price increases generally limit the potential for the significant exercise of market power (because moving the market price substantially requires withholding, without revenue, a large quantity).

While current levels of share consolidation do not appear to result in market power in the product market (monopoly/oligopoly), it could create market power in the input market (monopsony/oligopsony) for the fishery resource, or the quota share market. In fact, the CIE review of the Compass Lexecon Report indicated that more attention should be paid to the

[46] For a detailed description of the Business Review process of the DOJ see: https://www.justice.gov/atr/business-reviews

[47] Sarah Heil, letter to Dr. Chis Moore, June 1, 2018.

[48] Price elasticity of demand is a measure used in economics to show the responsiveness, or elasticity, of the quantity demanded of a good or service to a change in its price when nothing but the price changes.

monopsony problem, which is the ability of processors to exert market power on the harvesting sector. The CIE report indicates that this may be of greater concern than the monopoly problem. The condition of TAC not binding and quota prices of zero[49] are also consistent with a monopsony scenario. Given that this is a vertically integrated industry with a small number processors and vessels predominately controlled by processors, the exercise of monopsony is of primary interest and it is a larger concern that monopolization in the output market (Walden 2011).

Monopsony power could be exercised by processors over harvesters by reducing their demand for harvesting services, lowering the market price of harvesting services, and increasing profits to the processing sector. However, if a processor owns a harvester, that firm would not benefit by underutilizing its own harvesting assets in order to depress the price of harvesting services. The processor will be motivated to use its own harvesting capacity when the incremental value of the harvest to the processor exceeds the incremental cost of harvesting, without regard for the effect of the additional harvesting on the market price of harvesting services. As a result, vertically integrated processors will increase harvest levels over those non-vertically integrated processors would choose were they to have influence over the market price of harvesting services (Mitchell et al. 2011). Lastly, from a social perspective, concentration of ownership and control could affect the social and community structure and participation in these fisheries. For example, from a social perspective, 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. Vertical integration allows individual processors to exert control from the time a clam is harvested from the sea bed to the sale and transport of the final clam products from their facilities.

The no action alternative is expected to have no impact 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. However, under alternative 1, there would be no limit on or definition of excessive shares accumulation included in the FMP. As such, it could potentially lead to one entity holding 100% of the ITQ allocation in the surfclam and/or ocean quahog fisheries. Alternative 1 is expected to have socioeconomic impacts ranging from no impact in the short-term to negative in the long-term if consolidation patterns result in decreased competition for these fisheries when compared to current conditions. Alternative 1 could result in further decrease or the elimination of independent harvesters (harvesters not vertically integrated) participating in these fisheries.

Under alternative 2, a single cap on how much quota share one individual or entity could hold would be established separately for surfclam and ocean quahog. The cap would be based on quota share ownership only with unlimited possession of cage tags allowed during the fishing year. Because alternative 2 is based on ownership-only values, none of the sub-alternatives discussed below account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. Participants in these fisheries have reported that there are

[49] Processors report that once it is clear that there will be excess quota available in a season (well before the end of the season, leaving sufficient opportunity to continue to harvest if harvesters and processors deem there to be sufficient demand), the price of quota is very low and near zero (Walden 2011, Mitchell et al. 2011).

various types of transactions involving cage tags that commonly occur, including cage tag transfers, long-term leases (e.g., five years or more), and transfers of cage tags from bank lenders and between both related and unrelated business entities.

This alternative allows leasing and other complex contracting and business practices (involving cage tag transfers) to continue without imposing a limit on the possession of cage tags during the fishing year; a limit would only be placed on quota share ownership. Essentially, these complex practices would be allowed to proceed without oversight.

Under Sub-Alternative 2.1, the single quota share ownership caps would be based on the highest level of quota share held by any individual or entity reported in the ownership data for each fishery (surfclam and ocean quahog) for the 2016-2017 period.[50] The species-specific cap levels are not the same for surfclam and ocean quahog. The single caps under this alternative would depend on the determination of quota share ownership levels under the cumulative 100% model or net actual percentage model and affiliate level (e.g., individual/business, family, or corporate officer). Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3.

The highest level of quota share held (owned) by any individual or entity for surfclam was 28% under both the net actual percentage model and cumulative percentage model regardless of affiliation levels analyzed (Table 2). For example, when you consider results for the cumulative 100% model at the individual/business affiliation level, the highest level of quota share held by a single individual/business was 28% in each 2016 and 2017. This means that a single individual or business held (owned) 28% of the total surfclam ITQ allocation during 2016-2017. This level of ownership does not change when the family level affiliation is considered because that individual/business with the highest holdings did not report family members holding additional allocations. Similarly, the 28% quota share value did not change when the corporate officer level affiliation was considered, as that individual/business did not report any officer(s) in their company that have other interests in other companies that also hold surfclam quota shares. However, those levels do vary across affiliation levels for other individual entities that occur below the cap. Only maximum values are shown in that Table 2. The highest level of quota share held (owned) by any individual or entity for ocean quahog was 22% under both the net actual percentage model and cumulative percentage model regardless of affiliation levels analyzed for the same reasons identified above for surfclam (Table 3).

As indicated above, the highest level of quota share held by any individual or entity during the 2016-2017 period was 28% for surfclam and 22% for ocean quahog (Tables 2 and 3). If fully consolidated, a 28% cap for surfclam could potentially result in a minimum of four large entities participating in the fishery (i.e., 28%, 28%, 28%, and 16%; Table 18). This implies at least four entities holding surfclam quota, which may provide some protection against predation or foreclosure of competitors. If fully consolidated, a 22% cap for ocean quahog could potentially result in a minimum of five large entities participating in the fishery (i.e., five large entities at 22%,

[50] On average, for the 2016-2017 period, 67% of the surfclam quota and 58% of the ocean quahog quota were landed (Table 4).

22%, 22%, 22%, and 12%; Table 18).[51] This implies at least five entities holding ocean quahog quota, which may provide some protection against predation or foreclosure of competitors. As previously indicated, "In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails" (Walden 2011). However, as indicated in section 5.0, it is also possible that under all alternatives evaluated, the resulting number of minimum entities could be larger than estimated in this document if full consolidation is not achieved.

The number of entities above and below specific maximum cap values for the various alternatives and sub-alternatives discussed in section 7.0 are presented in Tables 18-21.[52] If the surfclam and ocean quahog cap levels described above (28% for surfclam and 22% for ocean quahog) had been implemented in 2017, all entities would have fallen at or below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 18). As such, no entity would have been constrained by the cap levels under sub-alternative 2.1 in the surfclam or ocean quahog fisheries.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This sub-alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without oversight. Therefore, while sub-alternative 2.1 would establish a relatively low single cap quota share ownership of 28% that limits the exercise of market power through capping ownership levels for surfclam, it does not address the creation or exercise of market power through contractual control of quota.

Sub-alternative 2.1 is expected to have no impact 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. However, sub-alternative 2.1 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. As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

[51] The resulting number of minimum entities under excessive shares cap alternatives 2 through 4 assume that market demand equals supply. When this is not the case, the leasing market could be disrupted (because available quota is larger than product demand) which could result in smaller firms or entities not associated with a processor being driven out of business.

[52] See Box 7.4 for a brief description of common terminology and definitions used in Tables 18-21.

Box 7.4. Terminology associated with the models and affiliation levels presented in Tables 18 to 21.	
Models	
Net Actual Percentage Model	Each owner's share in an LLC or company is used to determine percentage (%) ownership in that business's quota share. Example: John owns 50% of a company, he is assumed to hold 50% of the quota share held by the company. When calculated, the credits and debits are tabulated throughout the year at the time of each transaction, and the maximum net balance that a person attained in a year is used for this determination.
Cumulative 100% Model	Any ownership interest in a quota share by an individual is calculated as 100% of that quota share. Example: John owns 50% of a company, but in this scenario, he is assumed to hold all (100%) of the quota share held by that company when determining overall quota holdings. When calculated, the credits (lease and quota share inputs) accrue over the year for each person; debits or leases out and permanent transfers out are not included in this calculation; and the total accrued credits for a year are used in the determination.
Affiliation Levels	
Individual/Business Level	Smallest unit at the individual level or business (if an individual owner cannot be identified).
Family Level	Includes any family associations that are not already accounted at the individual or business level.
Corporate Officer Level	Includes association through corporate officer's that are not accounted for in the other levels.
PCT	Percentage
sm, lg	Small, Large

Under Sub-Alternative 2.2, the single quota share ownership cap would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of quota share allocation within the fishing year. If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%; Table 18).

If the surfclam and ocean quahog cap levels described above (49% for surfclam and 49% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 18). As such, no entity would have been constrained by the cap levels under sub-alternative 2.2 in the surfclam or ocean quahog fisheries.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This sub-alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without oversight. Therefore, while sub-

alternative 2.2 would establish a single cap quota share ownership of 49% that limits the exercise of market power through capping ownership levels for surfclam, it does not address the creation or exercise of market power through contractual control of quota.

Sub-alternative 2.2 is expected to have no impact 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. However, sub-alternative 2.2 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. As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Under Sub-Alternative 2.3, the single quota share ownership cap would be 95% for surfclam and 95% for ocean quahog. This sub-alternative was recommended for inclusion by the Surfclam and Ocean Quahog Committee. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly/oligopoly). If fully consolidated, a 95% cap could potentially result in a minimum of two entities participating in the fisheries (i.e., one very large entity and one small entity at 95% and 5%; Table 18).

If the surfclam and ocean quahog cap levels described above (95% for surfclam and 95% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 18). As such, no entity would have been constrained by the cap levels under sub-alternative 2.3 in the surfclam or ocean quahog fisheries.

It is stated in the Compass Lexecon Report it is possible that under some circumstances an excessive shares cap level of 100% may be appropriate. However, this does not appear to be the case for the surfclam and ocean quahog fisheries ITQ system under current conditions (Mitchell et al. 2011). Alternative 2.3 could potentially result in quota accumulation levels that are near identical to those under alternative 1 (*status quo* alternative). If one firm or entity controls 95% of the quota, there would be no market for leasing under the current quota levels for these species, as nearly all the quota would be held by a single entity.

As previously indicated under the *status quo* alternative, while current levels of share consolidation do not appear to result in market power in the product market (monopoly/oligopoly), it could create market power in the input market (monopsony/oligopsony) for the fishery resource, or the quota share market. In fact, the CIE review of the Compass Lexecon Report indicated that more attention should be paid to the monopsony problem, which is the ability of processors to exert market power on the harvesting sector. The CIE report indicates that this may be of greater concern than the

monopoly problem. The condition of TAC not binding and quota prices of zero[53] are also consistent with a monopsony scenario. Given that this is a vertically integrated industry with a small number processors and vessels predominately controlled by processors, the exercise of monopsony is of primary interest and it is a larger concern that monopolization in the output market (Walden 2011).

Monopsony power could be exercised by processors over harvesters by reducing their demand for harvesting services, lowering the market price of harvesting services, and increasing profits to the processing sector. However, if a processor owns a harvester, that firm would not benefit by underutilizing its own harvesting assets in order to depress the price of harvesting services. The processor will be motivated to use its own harvesting capacity when the incremental value of the harvest to the processor exceeds the incremental cost of harvesting, without regard for the effect of the additional harvesting on the market price of harvesting services. As a result, vertically integrated processors will increase harvest levels over those non-vertically integrated processors would choose were they to have influence over the market price of harvesting services (Mitchell et al. 2011). Lastly, from a social perspective, concentration of ownership and control could affect the social and community structure and participation in these fisheries.

Sub-alternative 2.3 is expected to have no impact 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. However, sub-alternative 2.3 could potentially allow for share concentration levels similar to those under the current conditions and as such, it could potentially lead to one entity holding 95% of the ITQ allocation in the surfclam and/or ocean quahog fisheries. Sub-alternative 2.3 is expected to have socioeconomic impacts ranging from no impact in the short-term to negative in the long-term if consolidation patterns result in decreased competition for these fisheries when compared to current conditions. Sub-alternative 2.3 could result in further decrease or the elimination of independent harvesters (harvesters not vertically integrated) participating in these fisheries.

Comparisons Across Sub-Alternatives 2.1 to 2.3

In this section a comparison between sub-alternatives 2.1 through 2.3 is made. This is different from the previous section where each of these sub-alternatives were compared to current conditions.

Sub-alternative 2.1 would have neutral socioeconomic impacts in the short-term compared to sub-alternatives 2.2 and 2.3 as no entity would be above the caps (if they had been implemented in 2017). However, in the long-term, alternative 2.1 would have slight positive socioeconomic impacts compared to sub-alternative 2.2, as sub-alternative 2.1 has the potential to provide a larger degree of protection against excessive consolidation and associated market power and social issues. For example, sub-alternative 2.1 could potentially result in a minimum of four (surfclam) to five (ocean quahog) large and efficient companies (e.g., with more than 10% market share), while sub-alternative 2.2 could potentially result in only two large and efficient companies (Table

[53] Processors report that once it is clear that there will be excess quota available in a season (well before the end of the season, leaving sufficient opportunity to continue to harvest if harvesters and processors deem there to be sufficient demand), the price of quota is very low and near zero (Walden 2011, Mitchell et al. 2011).

18; if fully consolidated). An excessive-share cap of 28% for surfclam and 22% for ocean quahog could potentially ensure that there would be at least four to five processors operating at reasonable output levels, respectively. Lastly, sub-alternative 2.1 would have positive socio-economic impacts in the long-term compared to sub-alternative 2.3, as sub-alternative 2.1 has the potential to provide a larger degree of protection against excessive consolidation (as sub-alternative 2.3 could potentially result in one large entity controlling 95% of the quota allocated for surfclam and/or ocean quahog).

Sub-alternative 2.2 would have less positive socioeconomic impacts in the long-term compared to sub-alternatives 2.1, as sub-alternative 2.2 has the potential to provide a smaller degree of protection against excessive consolidation and associated market power and social issues. Lastly, sub-alternative 2.2 would have positive socioeconomic impacts in the long-term compared to sub-alternative 2.3, as sub-alternative 2.2 has the potential to provide a larger degree of protection against excessive consolidation.

Sub-alternative 2.3 would have negative socioeconomic impacts in the long-term compared to sub-alternatives 2.1 and 2.2, as sub-alternative 2.3 has the potential to provide the smallest degree of protection against excessive consolidation and associated market power and social issues. Sub-alternative 2.3 has the potential to provide even less competition when compared to current conditions.

In general terms, when ranking these three sub-alternatives, sub-alternative 2.1 would result in the most positive impacts, sub-alternative 2.2 would result in the second most positive impacts, and sub-alternative 2.3 would result in negative impacts.

Table 18. Potential impacts of sub-alternatives 2.1-2.3, Single Cap – Quota share ownership cap-only with unlimited possession of cage tags allowed during the fishing year for various models and affiliate levels.

	Net Actual Percentage Model						Cumulative 100% Model					
	Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)		Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)	
Sub-Alternative 2.1: Single Cap – Quota share ownership cap-only with unlimited possession of cage tags allowed during the fishing year; cap based on highest level in the ownership data, 2016-2017												
Surfclam Values												
Cap value	28%		28%		28%		28%		28%		28%	
# entities below and above cap value	44	0	44	0	44	0	56	0	56	0	56	0
min # entities & PCTs	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16
Ocean Quahog Values												
Cap value	22%		22%		22%		22%		22%		22%	
# entities below and above cap value	42	0	42	0	42	0	45	0	45	0	45	0
min # entities & PCTs	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12
Sub-Alternative 2.2: Single Cap – Quota share ownership cap-only at 49% with unlimited possession of cage tags allowed during the fishing year; this cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share plus the transfer/leasing of quota share allocation within the fishing year												
Surfclam Values												
Cap value	49%		49%		49%		49%		49%		49%	
# entities below and above cap value	44	0	44	0	44	0	56	0	56	0	56	0
min # entities & PCTs	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2
Ocean Quahog Values												
Cap value	49%		49%		49%		49%		49%		49%	
# entities below and above cap value	42	0	42	0	42	0	45	0	45	0	45	0
min # entities & PCTs	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2
Sub-Alternative 2.3: Single Cap – Quota share ownership cap-only at 95% with unlimited possession of cage tags allowed during the fishing year; cap at 95% based on industry representatives indicating that there is no market power (no monopolistic behavior)												
Surfclam Values												
Cap value	95%		95%		95%		95%		95%		95%	
# entities below and above cap value	44	0	44	0	44	0	56	0	56	0	56	0
min # entities & PCTs	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5
Ocean Quahog Values												
Cap value	95%		95%		95%		95%		95%		95%	
# entities below and above cap value	42	0	42	0	42	0	45	0	45	0	45	0
min # entities & PCTs	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5	1 lg; 1 sm	95; 5

Under alternative 3, a cap would be implemented based on possession of both owned quota share and cage tags by an individual or entity. Because alternative 3 is based on possession of cage tags that are both owned and transferred, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). This alternative imposes a limit on the possession of cage tags that are both owned and transferred, which would account for transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that occur in these fisheries.

Under sub-alternative 3.1, the cap would be based on the highest level of possession of both owned quota share and cage tags held by any individual or entity reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. The species-specific cap levels are not the same for surfclam and ocean quahog. The caps under this alternative would depend on the model and affiliate levels selected by the Council. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3.

Under sub-alternative 3.1, depending on the affiliate level and model selected, the cap for surfclam could be as low as 28% under the net actual percentage model (at the individual/business level) or as high as 49% under the cumulative 100% model (at the corporate officer level; Table 2). Based on these cap values, sub-alternative 3.1 could result in a minimum number of large entities (if fully consolidated) in the surfclam fishery ranging from four under the net actual percentage model to two under the cumulative 100% model (Table 19). Under this alternative, depending on the affiliate level and model selected, the cap for ocean quahog could be as low as 29% under the net actual percentage model (at the individual/business level) or as high as 41% under the cumulative 100% model (at the corporate officer level; Table 3). For ocean quahog, this sub-alternative could result in a minimum number of large entities (if fully consolidated) ranging from four under the net actual percentage model to three under the cumulative 100% model (Table 19).

If the surfclam and ocean quahog cap levels described above had been implemented in 2017, all entities would have fallen below those caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 19). As such, no entity would have been constrained by the cap levels under sub-alternative 3.1 in the surfclam or ocean quahog fisheries.

Sub-alternative 3.1 is expected to have no impact 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. Sub-alternative 3.1 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. However, some of the possible lower cap values under this sub-alternative (e.g., 28% under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values.

Since this sub-alternative would implement a cap on owned quota share and possession of cage tags, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Under sub-alternative 3.2, the cap on possession of both owned quota share and cage tags by an individual or entity would be 40% for surfclam and 40% for ocean quahog. This is based on the "Rule of Three" notion (Mitchell et al. 2011, Walden 2011). "In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails." And "An excessive-share cap of 40% assures that there would be at least three processors operating at reasonable output levels" (Walden 2011). If fully consolidated, a 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%; Table 19).

If the surfclam and ocean quahog cap levels described above (40% for surfclam and 40% for ocean quahog) had been implemented in 2017, all entities would have fallen below those caps under the net actual percentage model for both surfclam and ocean quahog. However, under the cumulative 100% model, between one (1% of all entities) and three (4% of all entities) surfclam entities and between one (2% of all entities) and four (9% of all entities) ocean quahog entities would have been above these levels depending on the affiliation level (Table 19).

Sub-alternative 3.2 is expected to have no impact 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. In general terms, sub-alternative 3.2 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. However, as indicated above, if sub-alternative 3.2 had been implemented in 2017 (under the cumulative 100% model) up to 4 entities (depending on the affiliate level chosen) would have been above 40%. As such, this sub-alternative would have negatively impacted those entities if implemented in 2017. It is important to mention that under this scenario (sub-alternative 3.2 and cumulative 100% model), those impacted entities would have been required to decrease their values (combined possession of both owned quota share and cage tags) which could have been accomplished by slightly reducing (between 1% and 7%) the amount of surfclam and/or ocean quahog cage tags possessed that year. This could be accomplished by transferring fewer tags (after the initial allocation of tags) to their possession that year. These 4 impacted entities would have incurred slight negative socioeconomic impacts in the short-term and long-term compared to current conditions.

Since this sub-alternative would implement a cap on quota share ownership and possession of cage tags, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Under sub-alternative 3.3, the cap on possession of both owned quota share and cage tags would be 49% for surfclam and 49% for ocean quahog. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share of the total allowable landings. If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%; Table 19).

If the surfclam and ocean quahog cap levels described above (49% for surfclam and 49% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 19). As such, no entity would have been constrained by the cap levels under sub-alternative 3.2 in the surfclam or ocean quahog fisheries.

Sub-alternative 3.3 is expected to have no impact 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. However, sub-alternative 3.3 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.

Since this sub-alternative would implement a cap on quota share ownership and possession of cage tags, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Comparisons Across Sub-Alternatives 3.1 to 3.3

In this section a comparison between sub-alternatives 3.1 through 3.3 is made. This is different from the previous section where each of these sub-alternatives were compared to current conditions.

Sub-alternative 3.1 would have neutral socioeconomic impacts in the short-term compared to sub-alternatives 3.2 and 3.3, as in general terms, no entity would be above the caps (if they had been implemented in 2017; the exception to this generality is listed below). In the long-term, alternative 3.1 would have neutral socioeconomic impacts in the long-term compared to sub-alternative 3.2, because they both could potentially result in a similar minimum number of entities (three or four large entities) participating in these fisheries (Table 19). The exception to this generalization would be sub-alternative 3.1 under the cumulative 100% model which would result in two large entities participating in the surfclam fishery, and as such, provides a lesser degree of protection against excessive consolidation and associated market power and social issues. As such, this results in long-term positive impacts that are smaller in magnitude. Lastly, in general terms, sub-alternative 3.1 would have positive socioeconomic impacts in the long-term compared to sub-alternative 3.3, as sub-alternative 3.1 has the potential to provide a larger degree of protection against excessive consolidation. However, some of the possible lower cap values under sub-alternative 3.1 (e.g., 28% under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values. As such, under these sub-alternative 3.1 specific cases, there would be negative socioeconomic impacts in the long-term compared to sub-alternative 3.2 and 3.3.

In general terms, sub-alternative 3.2 would have slight positive socioeconomic impacts in the long-term compared to sub-alternative 3.3, as sub-alternative 3.2 has the potential to provide a larger degree of protection against excessive consolidation and associated market power and social issues. However, as noted above, if sub-alternative 3.2 had been implemented in 2017 (under the cumulative 100% model) up to 4 entities (depending on the affiliate level chosen) would have been above 40%. As such, this sub-alternative would have negatively impacted those entities if implemented in 2017. It is important to mention that under this scenario (sub-alternative 3.2 and cumulative 100% model), those impacted entities would have been required to decrease their values (combined possession of both owned quota share and cage tags) which could have been accomplished by slightly reducing (between 1% and 7%) the amount of surfclam and/or ocean quahog cage tags possessed that year. This could be accomplished by transferring fewer tags (after the initial allocation of tags) to their possession that year. These 4 impacted entities would have incurred slight negative socioeconomic impacts in the short-term and long-term compared to current conditions.

Sub-alternative 3.3 would have slightly less positive socioeconomic impacts in the long-term compared to sub-alternatives 3.1 and 3.2, as sub-alternative 3.3 has the potential to provide a smaller degree of protection against excessive consolidation and associated market power and social issues.

In general terms, when ranking these three sub-alternatives, sub-alternative 3.1 would result in the most positive impacts, sub-alternative 3.2 would result in the second most positive impacts, and sub-alternative 3.3 would result in the least positive impacts.

Table 19. Potential impacts of sub-alternatives 3.1-3.3, Cap based on possession of owned quota share and cage tags for various models and affiliate levels.

	Net Actual Percentage Model						Cumulative 100% Model					
	Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)		Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)	
Sub-Alternative 3.1: Cap on possession of owned quota share and cage tags based on highest level in the ownership and transfer data, 2016-2017												
Surfclam Values												
Cap value	28%		33%		44%		48%		49%		49%	
# entities below and above cap value	53	0	54	0	54	0	70	0	70	0	70	0
min # entities & PCTs	4 lg	28; 28; 28; 16	3 lg; 1 sm	33; 33; 33; 1	3 lg	44; 44; 12	2 lg; 1 sm	48; 48; 3	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2
Ocean Quahog Values												
Cap value	29%		29%		39%		41%		41%		41%	
# entities below and above cap value	43	0	43	0	43	0	47	0	47	0	47	0
min # entities & PCTs	4 lg	29; 29; 29; 13	4 lg	29; 29; 29; 13	3 lg	39, 39, 22	3 lg	41; 41; 18	3 lg	41; 41; 18	3 lg	41; 41; 18
Sub-Alternative 3.2: Cap on possession of owned quota share and cage tags; cap at 40% based on the "Rule of Three" notion												
Surfclam Values												
Cap value	40%		40%		40%		40%		40%		40%	
# entities below and above cap value	53	0	54	0	54	0	69	1	68	2	67	3
min # entities & PCTs	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20
Ocean Quahog Values												
Cap value	40%		40%		40%		40%		40%		40%	
# entities below and above cap value	43	0	43	0	43	0	46	1	44	3	43	4
min # entities & PCTs	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20
Sub-Alternative 3.3: Cap on possession of owned quota share and cage tags; cap at 49%. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share of the total allowable landing												
Surfclam Values												
Cap value	49%		49%		49%		49%		49%		49%	
# entities below and above cap value	53	0	54	0	54	0	70	0	70	0	70	0
min # entities & PCTs	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2
Ocean Quahog Values												
Cap value	49%		49%		49%		49%		49%		49%	
# entities below and above cap value	43	0	43	0	43	0	47	0	47	0	47	0
min # entities & PCTs	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2	2 lg; 1 sm	49; 49; 2

Under Alternative 4, a two-part cap approach would be implemented for each surfclam and ocean quahog, with the first part being a cap on quota share ownership, and a second, cap on the possession of cage tags by an individual or entity. This is based on recommendations for a two-part cap provided in the Compass Lexecon Report. Mitchell et al. (2011) indicated that "the preference for short-term accumulations in the two-part cap limits the share of long-term quota controlled by any single party, which limits the ability to foreclose competitors by withholding quota on a committed multi-season basis." Because alternative 4 is based on a two-part cap approach that limits possession of both owned quota share and cage tags, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). Since this alternative limits the possession of both owned and transferred cage tags by an individual or entity, it accounts for transactions and complex contracting and business practices that occur in these fisheries.

Under sub-alternative 4.1, the two-part cap approach includes one cap on allocation ownership and a second cap on possession of both owned quota share and cage tags by an individual or entity based on the highest levels reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) for the 2016-2017 period. The species-specific cap levels are not the same for surfclam and ocean quahog. The two-part cap values under this alternative would depend on the determination of two-part cap levels under the cumulative 100% model or net actual percentage model and affiliate level (e.g., individual/business, family, or corporate officer) selected by the Council. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Tables 2 and 3.

Under sub-alternative 4.1, depending on the affiliate level and model selected, the two-part cap for surfclam could be as low as 28% quota share ownership / 28% cage tags under the net actual percentage model (at the individual/business level) or as high as 28% quota share ownership / 49% cage tags under the cumulative 100% model (at the corporate officer level; Tables 2 and 20). Based on these cap values, sub-alternative 4.1 could result in a minimum of four large entities (if fully consolidated) in the surfclam fishery regardless of model or affiliation level used (Table 20). Under this alternative, depending on the affiliate level and model selected, the two-part cap for ocean quahog could be as low as 22% quota share ownership / 29% cage tags under the net actual percentage model (at the individual/business level) or as high as 22% quota share ownership / 41% cage tags under the cumulative 100% model (at the corporate officer level; Tables 3 and 20). For ocean quahog, this sub-alternative could result in a minimum of five large entities (if fully consolidated) in the ocean quahog fishery regardless of model or affiliation level used (Table 20).

If the surfclam and ocean quahog two-part cap levels described above had been implemented in 2017, all entities would have fallen below those caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the two-part cap levels under sub-alternative 4.1 in the surfclam or ocean quahog fisheries.

Sub-alternative 4.1 is expected to have no impact 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.

However, sub-alternative 4.1 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. Furthermore, some of the possible lower two-part cap values under this sub-alternative (e.g., 28% quota share ownership / 28% cage tags under the net actual percentage model at the individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values.

Since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Under sub-alternative 4.2, the two-part cap approach would be based on values reported in the ownership and transfer data for each fishery (surfclam and ocean quahog) during the 2016-2017 period (as done under sub-alternative 4.1). However, under this sub-alternative, 15% is added to the maximum values reported in the ownership and transfer data for 2016-2017 to allow for additional consolidation (Table 20). The 15% value was recommended by some industry representatives and is expected to provide flexibility for efficient firms in the surfclam and ocean quahog fisheries to consolidate further if market conditions allow. The species-specific cap levels are not the same for surfclam and ocean quahog. As with sub-alternative 4.1, the two-part cap values under this alternative would depend on the determination of two-part cap levels under the cumulative 100% model or net actual percentage model and affiliate level (e.g., individual/business, family, or corporate officer) selected by the Council. Specific maximum values for various models and level of analysis (i.e., affiliate levels) are presented in Table 20.

Under sub-alternative 4.2, depending on the affiliate level and model selected, the two-part cap for surfclam could be as low as 43% / 43% under the net actual percentage model (at the individual/business level) or as high as 43% / 64% under the cumulative 100% model (at the corporate officer level; Table 20). Based on these cap values, sub-alternative 4.2 could result in a minimum of three large entities (if fully consolidated) in the surfclam fishery regardless of model or affiliation level used (Table 20). Under this alternative, depending on the affiliate level and model selected, the two-part cap for ocean quahog could be as low as 37% / 44% under the net actual percentage model (at the individual/business level) or as high as 37% / 56% under the cumulative 100% model (at the corporate officer level; Table 20). For ocean quahog, this sub-alternative could result in a minimum of three large entities (if fully consolidated) in the ocean quahog fishery regardless of model or affiliation level used (Table 20).

If the surfclam and ocean quahog two-part cap levels described above had been implemented in 2017, all entities would have fallen below those caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the two-part cap levels under sub-alternative 4.2 in the surfclam or ocean quahog fisheries.

Sub-alternative 4.2 is expected to have no impact 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. However, sub-alternative 4.2 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.

Since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Under sub-alternative 4.3, the quota share ownership cap would be 30% and a second, higher cap on cage tags would be 60%. These values are based on recommendations for a two-part cap provided in the Compass Lexecon Report. A 30% ownership cap and a 60% cap (based on possession of cage tags) could potentially result in a minimum of four large entities (if fully consolidated) participating in the fisheries (i.e., 30%, 30%, 30%, 10%; Table 20).

If the surfclam and ocean quahog two-part cap levels described above (30/60% for surfclam and 30/60% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the cap levels under sub-alternative 4.3 in the surfclam or ocean quahog fisheries.

Sub-alternative 4.3 is expected to have no impact 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. However, sub-alternative 4.3 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.

Since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an

issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Under Council-preferred sub-alternative 4.4, Two-part cap – quota share ownership cap and second, higher cap based on possession of cage tags; Surfclam: 35/65% and Ocean quahog: 40/70%. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership. The Council selected the family affiliate level because most of the connections in these fisheries are already connected at the individual/business and family level; therefore, the corporate officer level added little additional information to the process in terms of ownership connections. Including just the family level captured the bulk of control through both individual/business and familial affiliations. This is the same affiliate level used in the Council's other individual fishing quota (IFQ) program, golden tilefish. In addition, the Council selected the 100% model for tracking because based on discussions with the Analysis Program and Support Division (APSD), as this would be the simplest tracking model, the least likely to create issues with tracking within year transactions, and it should result in the lowest cost recovery burden for ITQ holders. This is the same tracking model that is used for the Atlantic sea scallop ITQ fishery, which is managed by the New England Council. The scallop fishery also has large numbers of transfers and transactions that occur within the fishing year and uses this tracking model to account for both ownership and control in the fishery. In addition, under the actual percentage model, individuals or businesses could circumvent the cap system by modifying their individual or business percent ownership in a company to ensure they remain below any excessive share quota ownership cap or cage tag possession cap requirements. Under the cumulative 100% model, if you touch it through ownership of quota shares or cage tag possession, it is tagged to you within the system. The Council indicated that this is the most straightforward and efficient model for tracking, with the benefit that it follows an already proven model for tracking in the Northeast.

If fully consolidated, this sub-alternative could potentially result in a minimum of three large entities participating in the surfclam fishery (i.e., 35%, 35%, 30%) and three large entities participating in the ocean quahog fishery (i.e., 40%, 40%, 20%; Table 20).

The cap values under sub-alternative 4.4 are a slight modification from the values presented under sub-alternative 4.3 and they represent an “industry compromise alternative” (according to most comments received during the public comment period) that would meet the amendment objective of setting excessive shares cap levels for these fisheries while allowing for some expansion (further consolidation) given the current ownership levels in the fisheries (i.e., 28% ownership for surfclam; 22% ownership for ocean quahog) if needed. While it was indicated that is a compromise alternative as it reflects cap levels that industry would accept; however, it was reiterated that the current management system (*status quo*/no action alternative 1) is working well and there is no need to implement excessive shares cap levels. The slightly higher quota share ownership cap for

ocean quahog (when compared to surfclam) is due to the fact that according to industry there are currently 2 plants processing ocean quahog.

If the surfclam and ocean quahog two-part cap levels described above (35/65% for surfclam and 40/70% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 20). As such, no entity would have been constrained by the cap levels under sub-alternative 4.4 in the surfclam or ocean quahog fisheries.

Sub-alternative 4.4 is expected to have no impact 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. However, sub-alternative 4.4 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.

Since this sub-alternative would implement a two-part cap, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). As previously indicated, an excessive share could result in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries.

Comparisons Across Sub-Alternatives 4.1 to 4.4

In this section a comparison between sub-alternatives 4.1 through 4.4 (Council-preferred) is made. This is different from the previous section where each of these sub-alternatives were compared to current conditions.

In general terms, sub-alternatives 4.1, 4.2, 4.3, and 4.4 are likely to have neutral socioeconomic impacts (e.g., similar magnitude and direction) in the short-term and long-term, because they all could potentially result in a similar minimum number of entities (three or four large entities) participating in these fisheries, if they had been implemented in 2017 (Table 20). Overall, sub-alternatives 4.1, 4.3, and 4.4 would result in neutral socioeconomic impacts in the short-run and marginally positive in the long-run compared to sub-alternative 4.2, as sub-alternative 4.2 provides slightly less protection against competition in the long-run compared to 4.1, 4.3, and 4.4. They all have the potential to provide a relatively similar degree of protection against excessive consolidation and associated market power and social issues. In addition, none of these sub-alternatives would result in any entity being above the caps (if they had been implemented in 2017). However, some of the possible lower two-part cap values under sub-alternative 4.1 (e.g., 28% quota share ownership / 28% cage tags under the net actual percentage model at the

individual/business affiliation level) could potentially disrupt future realization of efficient-enhancing economies of scale, as it would not allow for expansion beyond any of these lower cap values. As such, under these sub-alternative 4.1 specific cases, there would be negative socioeconomic impacts in the long-term compared to sub-alternatives 4.2, 4.3, and 4.4.

Table 20. Potential impacts of sub-alternatives 4.1-4.4, Two-Part Cap Approach – A cap on quota share ownership and a second, higher cap based on possession of cage tags for various models and affiliate levels.

	Net Actual Percentage Model						Cumulative 100% Model					
	Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)		Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)	
Sub-Alternative 4.1: Two-Part Cap Approach – A cap on quota share ownership and a second cap on possession of cage tags; cap based on highest level in the ownership and transfer data, 2016-2017												
Surfclam Values												
Cap value	28/28		28/33		28/44		28/48		28/49		28/49	
# entities below and above cap value	53	0	54	0	54	0	70	0	70	0	70	0
min # entities & PCTs	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16	4 lg	28; 28; 28; 16
Ocean Quahog Values												
Cap value	22/29		22/29		22/39		22/41		22/41		22/41	
# entities below and above cap value	43	0	43	0	43	0	47	0	47	0	47	0
min # entities & PCTs	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12	5 lg	22; 22; 22; 22; 12
Sub-Alternative 4.2: Two-Part Cap Approach – A cap on quota share ownership and a second cap on possession of cage tags; cap based on highest level in the ownership data, 2016-2017, plus 15% added to the maximum levels to allow for additional consolidation												
Surfclam Values												
Cap value	43/43		43/48		43/59		43/63		43/64		43/64	
# entities below and above cap value	53	0	54	0	54	0	70	0	70	0	70	0
min # entities & PCTs	3 lg	43; 43; 14	3 lg	43; 43; 14	3 lg	43; 43; 14	3 lg	43; 43; 14	3 lg	43; 43; 14	3 lg	43; 43; 14
Ocean Quahog Values												
Cap value	37/44		37/44		37/54		37/56		37/56		37/56	
# entities below and above cap value	43	0	43	0	43	0	47	0	47	0	47	0
min # entities & PCTs	3 lg	37; 37; 26	3 lg	37; 37; 26	3 lg	37; 37; 26	3 lg	37; 37; 26	3 lg	37; 37; 26	3 lg	37; 37; 26

Table 20 (continued). Potential impacts of sub-alternatives 4.1-4.4, Two-Part Cap Approach – A cap on quota share ownership and a second, higher cap based on possession of cage tags for various models and affiliate levels.

	Net Actual Percentage Model						Cumulative 100% Model					
	Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)		Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)	
Sub-Alternative 4.3: Two-Part Cap Approach – A cap on quota share ownership and a second cap on possession of cage tags; quota share ownership cap at 30% and a second cap at 60%												
Surfclam Values												
Cap value	30/60		30/60		30/60		30/60		30/60		30/60	
# entities below and above cap value	53	0	54	0	54	0	70	0	70	0	70	0
min # entities & PCTs	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10
Ocean Quahog Values												
Cap value	30/60		30/60		30/60		30/60		30/60		30/60	
# entities below and above cap value	43	0	43	0	43	0	47	0	47	0	47	0
min # entities & PCTs	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10	4 lg	30; 30; 30; 10
Sub-Alternative 4.4: Preferred – Two-Part Cap Approach – A cap on quota share ownership and a second cap on possession of cage tags; Surfclam: 35/65% and Ocean quahog: 40/70%.												
Surfclam Values												
Cap value	35/65		35/65		35/65		35/65		35/65		35/65	
# entities below and above cap value	53	0	54	0	54	0	70	0	70	0	70	0
min # entities & PCTs	3 lg	35; 35; 30	3 lg	35; 35; 30	3 lg	35; 35; 30	3 lg	35; 35; 30	3 lg	35; 35; 30	3 lg	35; 35; 30
Ocean Quahog Values												
Cap value	40/70		40/70		40/70		40/70		40/70		40/70	
# entities below and above cap value	43	0	43	0	43	0	47	0	47	0	47	0
min # entities & PCTs	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20

Under Alternatives 5, a cap on quota share ownership-only of 40% for surfclam and 40% for ocean quahog with unlimited possession of cage tags allowed during the fishing year would be implemented. In addition, this alternative would also establish Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT (or overall quota level) and A shares. B shares are not released until all A shares are used/exhausted.

The 40% cap under this alternative is based on the "Rule of Three" notion (Mitchell et al. 2011, Walden 2011). In the business literature, there is a widely accepted notion that a Rule of Three structure is optimal because three big and efficient companies (e.g., with more than 10% market share) act as a tripod to ensure that neither destructive competition nor collusion prevails." And "An excessive-share cap of 40% assures that there would be at least three processors operating at reasonable output levels" (Walden 2011).

This alternative would align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). The FMAT noted that the "two-part system" (i.e., cap on ownership plus Quota A/B shares) would not be needed if the ACT (or overall quota level) was aligned each year with the anticipated market demand. Alternatively, an advantage of a "two-part system" is that it allows additional flexibility for increasing harvests if there is a surge in demand for surfclam or ocean quahog midway through the fishing year. If fully consolidated, a 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%; Table 21).

As described in section 6.0, the surfclam and ocean quahog fisheries are quite special and unique in the following three aspects. First, harvested surfclam and ocean quahog must be processed before sale (e.g., clam strips, chopped or ground form for other products, such as high-quality soups and chowders). As such, processing requires more than simply heading and gutting. Second, there are a few byers of the processed products (e.g., Campbell Soup Company, Progresso, or large food service companies, such as Sysco). Third, for a number of years, the TAC has not been harvested. Furthermore, as indicated in section 6.0, net exit has occurred in the surfclam and ocean quahog processing sectors (for shellstock) for a variety of reasons.

The level the industry is willing and able to produce and sell in a given year, *ceteris paribus* (all else being equal) is the market equilibrium output (MEO). As indicated before, the current condition for both species is TAC [ACT] > MEO. A plausible explanation for the current state of excessive consolidation in the industry follows these three unique aspects in both fisheries. Given the share concentration levels in the processing sector, some processors could produce the MEO level of production with their own annual shares, and all other shares would go unused. The processors have monopsony power with respect to the purchase of quota shares. If TAC < MEO, as it is in every other ITQ program, in order to fulfill the market demand, all of the catch shares will have to be utilized and all ITQ shareholders would be able to utilize their shares and the monopsony power would disappear. Since the condition in these fisheries is that the TAC > MEO, some catch share owners cannot rent or sell their shares due to the monopsony power of the

processors. The monopsony gains to the processors is the increase in net revenue due to the fact they do not have to pay for all of the catch shares, as is the case in all other ITQ programs.[54]

If the surfclam and ocean quahog cap levels described above (40% for surfclam and 40% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; Table 21). As such, no entity would have been constrained by the cap levels under alternative 5 in the surfclam or ocean quahog fisheries.

As indicated above, in addition to the cap on quota share ownership, this alternative would also establish Quota A and B shares (for each individual species). A hypothetical example of how the two quota-tier system (Quota A shares and Quota B shares) would work is presented in section 5.1.5. In general terms, this alternative would align Quota A shares (the initial quota level) with recent years landings (a proxy for market demand). Quota A shares (and associated number of cage tags) would be released at the onset of the fishing year and Quota B shares (and associated number of cage tags) would be released when Quota A shares are used/exhausted.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing and other complex contracting and business practices (involving cage tag transfers) to continue without imposing a limit on the possession of cage tags during the fishing year; a limit would only be placed on quota share ownership. Essentially, these complex practices would be allowed to proceed without oversight. However, if the supply of quota released under Quota A shares equals the market demand, there may be less incentive for a quota holder to enter into long-term contracts. One of the reasons long-term contracts exist is that if a quota holder doesn't enter into one, then there is a real possibility that they won't be able to lease their quota out at all in a given fishing year as the overall quota level for these fisheries have been at values that exceed market demand. It is possible that under this alternative, if there is less of an incentive to enter into long-term leases, their arrangements may change if the price of leases increase.

The Atlantic Surfclam and Ocean Quahog Information Collection Program Data (Ownership Data) was designed to gather information on leases (short-term and long-term) to assist in determining contractual control of quota. However, industry members have indicated that they would not release this information as some people consider it private. As such, given the incomplete information available, contractual control of quota cannot be accurately tracked.

Alternative 5 is expected to result in mixed socioeconomic impacts when compared to current conditions. Overall, alternative 5 is expected to have no impact 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. In terms of providing protection against excessive consolidation and associated market power issues, alternative 5 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. An outcome of

[54] Report of the May 2019 SSC Meeting. Available at: http://www.mafmc.org/ssc

obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done.

During the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative socioeconomic impacts that would disrupt current business practices. For example:

- It was indicated that establishing a Quota A and Quota B shares system would send a market signal indicating that the surfclam and ocean quahog quotas (TACs) have been reduced, because the amount of quota released under Quota A shares is lower than the overall TACs that have been implemented in recent years. This in turn could result in big companies that purchase clam products (Progresso, Campbell Soup Company, etc.) to switch to lower quality foreign imports
- The Quota A and Quota B shares system would disrupt banking/financial arrangement because ITQ shares have been used as collateral in securing long-term loans
- Aligning the quota with market demand may not necessarily result in equilibrium because long-term contracts arrangements (leasing arrangements) exist in these fisheries; and breaking existing long-term contracts could result in lawsuits
- Aligning the quota with market demand would give market power to the industry members that have not been able to lease/use their ITQ shares in recent years
- This alternative could result in closing of processing plants
- There is the potential for someone to lease large quantities of A shares and not use them to develop market power

Since this alternative would implement a two quota-tier system (Quota A shares and Quota B shares), it would align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). This could result in more activity in the leasing market and prevention of exclusionary practices. While this may in turn benefit quota holders that have not been able to use (due to market demand) or lease (due to a depressed leasing market) their quota allocations in recent years, it may adversely impact current entities that lease quota if quota lease prices increase.

Furthermore, current participants may be compelled to lease additional allocations (before Quota B shares are released) from other industry participants in order to maintain their previous levels of harvest. However, this is not expected to increase the cost of harvesting. The real cost of harvesting and processing should not change at all. The same amount of gas will be burned and the same

amount of labor will be used, etc. Processors will likely have to pay more in financial costs (due to additional leasing and/or purchase costs), which will decrease net revenue due to the loss in monopsony power which will be transferred to fully participating ITQ owners (see footnote #54 on page 160).

Surfclam and Ocean quahog processors have indicated in the past that they cannot influence the price of the products they sell, as the large companies that purchase from them (Campbell Soup Company, Progresso, etc.) will not consider price increases as they can buy other raw materials to produce their products. As such, it would be expected that profits for the processing sector would go down. In conclusion, while not quantifiable, there may be distributional impacts associated with this alternative, as processors may need to lease quotas, but this would be offset with gains in the leasing market.

Moreover, it is possible that there could be quota allocation holders that may not want to lease their quota allocations out thus impeding the release of Quota B shares. If this were to occur, landings could be affected and additional flexibility for increasing harvests if there is a surge in demand for surfclam or ocean quahog midway through the fishing year could not be met. One way to address this issue could be to release Quota B shares when 90 or 95% of Quota A shares have been used. If this alternative is selected by the Council, additional analysis should be conducted to determine the appropriate trigger level.

Table 21. Potential impacts of alternative 5, Quota share ownership cap-only at 40% with unlimited possession of cage tags allowed during the fishing year, plus a two-tier quota) for various models and affiliate levels.

	Net Actual Percentage Model						Cumulative 100% Model					
	Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)		Individual / Business Level		Family Level (individual / business level +family level)		Corporate Officer Level (individual / business level +family level +corporate officer level)	
Alternative 5 - Cap based on a 40% quota share ownership-only with unlimited possession of cage tags allowed during the fishing year												
Surfclam Values												
Cap value	40%		40%		40%		40%		40%		40%	
# entities below and above cap value	44	0	44	0	44	0	56	0	56	0	56	0
min # entities & PCTs	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20
Ocean Quahog Values												
Cap value	40%		40%		40%		40%		40%		40%	
# entities below and above cap value	42	0	42	0	42	0	45	0	45	0	45	0
min # entities & PCTs	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20	3 lg	40; 40; 20

Under Alternatives 6, a cap on quota share ownership-only of 49% for surfclam and 49% for ocean quahog with unlimited possession of cage tags allowed during the fishing year would be implemented. In addition, this alternative would also establish Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT (or overall quota level) and A shares. B shares are not released until all A shares are used/exhausted. This cap is similar to the golden tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish, it is applied to ownership of quota share and the transfer/leasing of quota share allocation within the fishing year. The only difference between alternatives 5 and 6 are the cap levels on quota share ownership; all other aspects of the alternatives are identical.

Like alternative 5, this alternative would also align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). If fully consolidated, a 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large and one small entity at 49%, 49%, and 2%). The resulting number of participating entities under this alternative are similar to those under sub-alternative 2.2 (which would also implement a 49% quota share cap; Table 18).

As described in section 6.0, the surfclam and ocean quahog fisheries are quite special and unique in the following aspects. First, harvested surfclam and ocean quahog must be processed before sale (e.g., clam strips, chopped or ground form for other products, such as high-quality soups and chowders). As such, processing requires more than simply heading and gutting. Second, there are a few byers of the processed products (e.g., Campbell Soup Company, Progresso, or large food service companies, such as Sysco). Lastly, for a number of years, the TAC has not been harvested.

The level the industry is willing and able to produce and sell in a given year, *ceteris paribus* (all else being equal) is the market equilibrium output (MEO). As indicated before, the current condition for both species is TAC [ACT] > MEO. A plausible explanation for the current state of excessive consolidation in the industry follows these three unique aspects in both fisheries. Given the share concentration levels in the processing sector, some processors could produce the MEO level of production with their own annual shares, and all other shares would go unused. The processors have monopsony power with respect to the purchase of quota shares. If TAC < MEO, as it is in every other ITQ program, in order to fulfill the market demand, all of the catch shares will have to be utilized and all ITQ shareholders would be able to utilize their shares and the monopsony power would disappear. Since the condition in these fisheries is that the TAC > MEO, some catch share owners cannot rent or sell their shares due to the monopsony power of the processors. The monopsony gains to the processors is the increase in net revenue due to the fact they do not have to pay for all of the catch shares, as is the case in all other ITQ programs (see footnote 54 on page 160).

If the surfclam and ocean quahog cap levels described above (49% for surfclam and 49% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (net actual percentage or cumulative 100% model) or affiliation level (individual/business, family, or corporate officer; see results under sub-

alternative 2.2 in Table 18). As such, no entity would have been constrained by the cap levels under alternative 6 in the surfclam or ocean quahog fisheries.

As indicated above, in addition to the cap on quota share ownership, this alternative would also establish Quota A and B shares (for each individual species). A hypothetical example how the two quota-tier system (Quota A shares and Quota B shares) would work is presented in section 5.1.5. In general terms, this alternative would align Quota A shares (the initial quota level) with recent years landings (a proxy for market demand). Quota A shares (and associated number of cage tags) would be released at the onset of the fishing year and Quota B shares (and associated number of cage tags) would be released when Quota A shares are used/exhausted.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing and other complex contracting and business practices (involving cage tag transfers) to continue without imposing a limit on the possession of cage tags during the fishing year; a limit would only be placed on quota share ownership. Essentially, these complex practices would be allowed to proceed without oversight. However, if the supply of quota released under Quota A shares equals the market demand, there may be less incentive for a quota holder to enter into long-term contracts. One of the reasons long-term contracts exist is that if a quota holder doesn't enter into one, then there is a real possibility that they won't be able to lease their quota out at all in a given fishing year as the overall quota level for these fisheries have been at values that exceed market demand. It is possible that under this alternative, if there is less of an incentive to enter into long-term leases, their arrangements may change if the price of leases increase.

The Atlantic Surfclam and Ocean Quahog Information Collection Program Data (Ownership Data) was designed to gather information on leases (short-term and long-term) to assist in determining contractual control of quota. However, industry members have indicated that they would not release this information as some people consider it private. As such, it is not likely that contractual control of quota can be accurately tracked. As such, given the incomplete information available, contractual control of quota cannot be accurately tracked.

Alternative 6 is expected to result in mixed impacts when compared to current conditions. Overall, alternative 6 is expected to have no impact 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. In terms of providing protection against excessive consolidation and associated market power issues, alternative 6 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. An outcome of obtaining market power could be pricing power in either output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market. In addition, excessive shares consolidation patterns could also result in community disruptions resulting in decrease in the number of independent harvesters and employment. Therefore, from a social perspective, excessive shares consolidation could affect the social and community structure and participation in these fisheries. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses. More specifically, for an individual/business that currently uses

nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done. In addition, as indicated above, during the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative socioeconomic impacts that would disrupt current business practices. These potential impacts listed under alternative 5 also apply here.

Since this alternative would implement a two quota-tier system (Quota A shares and Quota B shares), it would align supply in the fisheries with market demand, an issue raised in a number of reports (Compass Lexecon Report and corresponding CIE review; Mitchell et al. 2011, Walden 2011). This could result in more activity in the leasing market and prevention of exclusionary practices. While this may in turn benefit quota holders that have not been able to use (due to market demand) or lease (due to a depressed leasing market) their quota allocations in recent years, it may adversely impact current entities that lease quota if quota lease prices increase.

Furthermore, current participants may be compelled to lease additional allocations (before Quota B shares are released) from other industry participants in order to maintain their previous levels of harvest. However, this is not expected to increase the cost of harvesting. The real cost of harvesting and processing should not change at all. The same amount of gas will be burned and the same amount of labor will be used, etc. Processors will likely have to pay more in financial costs (due to additional leasing and/or purchase costs), which will decrease net revenue due to the loss in monopsony power which will be transferred to fully participating ITQ owners (see footnote #54 on page 160).

Surfclam and Ocean quahog processors have indicated in the past that they cannot influence the price of the products they sell, as the large companies that purchase from them (Campbell Soup Company, Progresso, etc.) will not consider price increases as they can buy other raw materials to produce their products. As such, it would be expected that profits for the processing sector would go down. In conclusion, while not quantifiable, there may be distributional impacts associated with this alternative, as processors may need to lease quotas, but this would be offset with gains in the leasing market.

Moreover, it is possible that there could be quota allocation holders that may not want to lease their quota allocations out thus impeding the release of Quota B shares. If this were to occur, landings could be affected and additional flexibility for increasing harvests if there is a surge in demand for surfclam or ocean quahog midway through the fishing year could not be met. One way to address this issue could be to release Quota B shares when 90 or 95% of Quota A shares have been used. If this alternative is selected by the Council, additional analysis should be conducted to determine the appropriate trigger level.

Comparisons Across All Excessive Shares Cap Alternatives

In general terms, alternatives 5 and 6 would result in the largest positive impacts as a result of protection against market power or other anticompetitive behaviors and associated social issues, alternatives 3 and 4 would result in the second highest positive impacts, alternative 2 would result in the third highest positive impacts, and alternative 1 would result in the least positive impacts. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses under alternatives 5 and 6 compared to all other excessive shares cap alternatives. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done. More detail of the expected impacts is provided below.

The comparison of impacts presented in this section are across the human communities VEC. As previously indicated, there are no impacts on any other VECs from any of the alternatives given that they are purely administrative in nature.

Alternative 1 (No Action/Status Quo)

As previously indicated, under alternative 1 (no action) no limit on or definition of excessive shares accumulation is included in the FMP. This alterative is expected to result in impacts ranging from no impacts in the short-term to negative impacts in the long-term when compared to alternatives 2 through alternative 6, because alternative 1 provides no protection against excessive consolidation and associated market power and social issues. The exception would be when alternative 1 is compared to sub-alternative 2.3, as sub-alternative 2.3 could potentially allow for share concentration levels similar to those under alternative 1, and it could potentially lead to one entity holding 95% of the ITQ allocation in the surfclam and/or ocean quahog fisheries. Compared to sub-alternative 2.3, alternative 1 is likely to have a similar magnitude of socioeconomic impacts (i.e., neutral).[55]

None of the excessive share alternatives discussed in this document are expected to impact 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.

Alternative 2

Alternative 2 would implement a single cap based on quota share ownership-only with unlimited possession of cage tags allowed during the fishing year. Because alternative 2 is based on ownership-only values, it does not account for leasing or other transactions and complex

[55] Since sub-alternative 2.3 is likely to result in impacts similar to those under alternative 1, all other comparisons involving alternative 2 exclude sub-alternative 2.3, with the understanding that when comparisons are made with sub-alternative 2.3 exclusively, impacts would be similar to those under alternative 1 (no action/*status quo*).

contracting and business practices (e.g., ownership and control through leasing/transfers of cage tags) that are prevalent in the fisheries when setting the cap limit. This alternative would limit the exercise of market power through capping ownership levels for surfclam and ocean quahog, but it does not address the creation or exercise of market power through contractual control of quota.

Alternative 2 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because it provides protection against excessive consolidation and associated market issues. Compared to alternative 3 and alternative 4, alternative 2 is expected to have similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude as alternative 2 does not address the creation or exercise of market power through contractual control of quota (as done under alternatives 3 and 4).

Lastly, in terms of providing protection against excessive consolidation and associated market power issues, alternative 2 is expected to result in similar directional impacts compared to alternatives 5 and 6 (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude because alternatives 5 and 6 not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices.

Alternative 3

Alternative 3 would implement a cap based on quota share ownership plus possession of cage tags. Because alternative 3 is based on combined possession of both owned and transferred cage tags, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota. This alternative imposes a combined limit on ownership plus leasing, which would account for transactions and complex contracting and business practices that occur in these fisheries.

Alternative 3 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because it provides protection against excessive consolidation and associated market issues. Compared to alternative 2, alternative 3 is expected to have similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) but slightly larger in magnitude as alternative 2 does not address the creation or exercise of market power through contractual control of quota (as done under alternative 3). Compared to alternative 4, alternative 3 is likely to have a similar magnitude of socioeconomic impacts (i.e., no impacts in the short-term to positive impacts in the long-term) as they both would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota.

Lastly, in terms of providing protection against excessive consolidation and associated market power issues, alternative 3 is expected to result in similar directional impacts compared to alternatives 5 and 6 (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude because alternatives 5 and 6 not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the

fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices.

Alternative 4

Alternative 4 would implement a two-part cap approach, with the first part being a cap on quota share ownership, and a second, higher cap on the possession of cage tags by an individual or entity.[56] Because alternative 4 is based on a two-part cap approach that limits the combined possession of both owned and transferred tags by an individual or entity, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota. This alternative imposes a combined limit on the possession of both owned and transferred tags, which would account for transactions and complex contracting and business practices that occur in these fisheries.

Alternative 4 is expected to result in impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because it provides protection against excessive consolidation and associated market issues. Compared to alternative 2, alternative 4 is expected to have similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) but slightly larger in magnitude as alternative 2 does not address the creation or exercise of market power through contractual control of quota (as done under alternative 4). Compared to alternative 3, alternative 4 is likely to have a similar magnitude of socioeconomic impacts (i.e., no impacts in the short-term to positive impacts in the long-term) as they both would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota.

Lastly, in terms of providing protection against excessive consolidation and associated market power issues, alternative 4 is expected to result in similar directional impacts compared to alternatives 5 and 6 (i.e., no impacts in the short-term to positive impacts in the long-term) but smaller in magnitude because alternatives 5 and 6 not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices.

Alternative 5

Alternative 5 would implement a cap on quota share ownership-only with unlimited possession of cage tags allowed during the fishing year. In addition, this alternative would also establish Quota A and B shares (for each individual species), where A shares is the current 3-year landings level (to be defined; e.g., rolling average; average highest 3 years out of the last 5 years) and B shares is the difference between the ACT (or overall quota level) and A shares. B shares are not released until all A shares are used/exhausted.

Alternative 5 is expected to result in mixed impacts. In terms of providing protection against excessive consolidation and associated market power issues, alternative 5 is expected to result in

[56] Sub-alternative 4.4, under alternative 4 is the Council-preferred alternative. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership.

impacts ranging from no impacts in the short-term to positive impacts in the long-term when compared to alternative 1, because alternative 5 not only addresses the exercise of market power through capping ownership levels for surfclam and ocean quahog but also aligns supply in the fisheries with market demand. Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices. For these same reasons, alternative 5 is expected to result in similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) compared to alternatives 2, 3, and 4, but likely smaller in magnitude. Lastly, compared to alternative 6, alternative 5 is expected to result in similar directional impacts (i.e., no impacts in the short-term to positive impacts in the long-term) as they both not only address the exercise of market power through capping ownership levels for surfclam and ocean quahog but also align supply in the fisheries with market demand. However, negative socioeconomic impacts are also possible in the short-term for some quota holders/businesses under alternatives 5 compared to excessive shares cap alternatives 1-4. More specifically, for an individual/business that currently uses nearly 100% (e.g., very little leasing required) of owned allocation to meet existing demand agreements, the implementation of a two-tier quota system (Quota A shares and Quota B shares) would require that such an individual/business lease in additional ITQ to meet existing demand requirements as not all of the ITQ quota for clams would be allocated at the beginning of the year as it is currently done. In addition, as indicated above, during the development of the Public Hearing Draft Document for the Excessive Shares Amendment, stakeholders representing processing firms indicated that the implementation of this alternative would result in unintended short and long-term negative socioeconomic impacts that would disrupt current business practices. These potential impacts were listed above under alternative 5.

Aligning supply in the fisheries with market demand may result in more activity in the leasing market and prevention of exclusionary practices. While not quantifiable, there may be distributional impacts associated with this alternative, as processors may need to lease quotas, but this would be offset with gains in the leasing market.

Alternative 6

The expected impacts under alternative 6 are similar to those described under alternative 5 above.

7.4.2 Excessive Shares Review Alternatives

Under alternative 1 (no action/s*tatus quo*), there would not be a requirement for periodic review of the excessive shares measures. The no action alternative is expected to have no impact on the prosecution of the surfclam and ocean quahog fisheries, including landings levels, fishery distribution, or fishing methods and practices. The no action alternative is expected to have no impact on the quantity of surfclam or ocean quahog landings, including revenues. However, as previously indicated, conditions in the fisheries have changed over time since the FMP was implemented and the ITQ system became effective, and those conditions are likely change in the future. An excessive shares measure established at an appropriate level now could over time become inefficiently high (offering too little constraint on the exercise of market power) or low (offering too much constraint on efficient competitive activity in the industry). Thus, not having a mechanism in place to review the effectiveness of implemented excessive shares measures could

result in socioeconomic impacts that range from no impacts (if implemented excessive shares measures or cap level is appropriate through time) to slight negative (if implemented excessive shares measures or cap level is not appropriate through time). Compared to alternative 2, alternative 1 is expected to have slight negative socioeconomic impacts.

Alternative 2 (Council-preferred) is administrative in nature and would require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed. As with the no action alternative above, alternative 2 is not expected to have impacts on the quantity of surfclam or ocean quahog landings, including revenues. However, this alternative allows periodic review of excessive shares measures that the Council adopts. As previously indicated conditions in the fisheries have changed over time since the FMP was implemented and the ITQ system became effective, and those conditions are likely change in the future. This alternative would implement a periodic review of regulations to protect against market power or other anticompetitive behaviors in these fisheries in a timely manner. Alternative 2 is expected to result in socioeconomic impacts ranging from no impacts to slight positive. Compared to alternative 1, alternative 2 is expected to have slight positive socioeconomic impacts. While it is not possible to anticipate the potential management cost associated with alternative 2, they are likely to be higher than those associated with alternative 1. Costs will depend on the complexity and scope of the review process.

7.4.3 Framework Adjustment Process Alternatives

Under Council-preferred alternative 1 (no action/s*tatus quo*), the list of management measures that have been identified in the FMP that could be addressed via framework adjustment process would not change (i.e., maintain the *status quo* list of measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap level to be modified via the framework adjustment process.

The Council would still have the prerogative to review any adopted excessive shares measures and make modifications to any implemented excessive cap level through an amendment if it becomes inefficiently high or low through time as fisheries conditions change. However, making modifications to existing regulations using an amendment process requires more work and time compared to a framework process. Not having the flexibility to make minor modifications to the excessive shares cap level (no action alternative) could result in socioeconomic impacts ranging from no impact to slightly negative. Compared to alternative 2, alternative 1 is expected to have slight negative socioeconomic impacts.

Alternative 2 is administrative in nature and strictly considers the expansion of the list of framework adjustment measures that have been identified in the FMP. This alternative would add adjustments to the excessive shares cap level to the list of frameworkable actions in the FMP. This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap). The proposed alternative would provide flexibility to address potential modifications to any implemented excessive cap level if it becomes inefficiently high or low through time as fisheries conditions change. Alternative 2 is expected to result in socioeconomic impacts that range from

no impact to slight positive. Compared to alternative 1, alternative 2 is expected to have slight positive socioeconomic impacts because this alternative provides the flexibility to adjust any implemented excessive cap level if it becomes inefficiently or low through time as fisheries conditions change, and this has the potential to reduce needed staff time and management cost.

7.4.4 Multi-Year Management Measures Alternatives

Under alternative 1 (no action/s*tatus quo*), there would be no changes to the process to set surfclam and ocean quahog management specifications for up to 3 years. The no action alternative is expected to have no socioeconomic impacts. Alternative 1 is expected to have the same impacts as alternative 2.

Alternative 2 (Council-preferred) is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Under alternative 2, specifications could be set for up to the maximum number of years needed to be consistent with the NRCC-approved stock assessment schedule. Specifications under the multi-year process described in alternative 2 would include all the environmental impact review procedures currently required under the MSA, and other applicable laws, including NEPA. These review procedures collectively ensure that impacts on fishery resources be considered prior to implementation of the proposed harvest levels. In addition, under this alternative, Council staff will coordinate with NEFSC staff, during the first quarter of each year (during the multi-year specifications period) to assess if there is any information regarding these fisheries that needs to be brought to the attention of the SSC and Council. Alternative 2 is expected to have no socioeconomic impacts. Alternative 2 would have socioeconomic impacts that are the same as those under alternative 1.

Although there are no socioeconomic impacts associated with alternative 2, it is expected that it would provide for substantial administrative efficiencies by reducing the need to create and implement multiple specification documents to set management measures for the fisheries between stock assessments (i.e., efficient use of Council and NOAA staff time supporting the management process; thus, reducing staff time and management cost).

7.5 Cumulative Effects Analysis

A cumulative effects analysis is required by the Council on Environmental Quality (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 cumulative effects analysis 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. Council on Environmental Quality 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 ideally 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.

7.5.1 Consideration of the VECs

The valued ecosystem components 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). The following sections discuss the significance of the cumulative effects on the following VECs:

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

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

7.5.2 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).

7.5.3 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 five years (2027) into the future. 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.

7.5.4 Actions Other Than Those Proposed in this Document

The impacts of the alternatives considered in this document are described in sections 7.1 through 7.4. This section summarizes the past, present, and reasonably foreseeable future actions and effects that are relevant for this cumulative effects assessment. Some past actions are still relevant to the present and/or future actions.

Surfclam and Ocean Quahog FMP Actions - Past, Present, and Reasonably Foreseeable Future

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. These fisheries are managed under an ITQ system, and recently, 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. Amendment 16 (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 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. In 2020, the Council has begun to explore an issue raised by the surfclam and ocean quahog fishing industry related to comingling 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. The Council is forming an FMAT to develop options/solutions that may be implemented through data collection or regulatory changes or a Council Amendment.

Other Fishery Management Actions - Past, Present, and Reasonably Foreseeable Future

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 7.5.3. 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 7.5.3 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.

Fishery Management Action Summary

The Council has taken many actions to manage the associated commercial fishery. 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. 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.

Non-Fishing Impacts

Other Human Activities

Non-fishing activities that occur in the marine nearshore and offshore environments and connected watersheds can cause the loss or degradation of habitat and/or affect the fish and protected species that utilize those areas. The impacts of most nearshore human-induced non-fishing activities tend

to be localized in the 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 non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore 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, 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, 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 measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally permitted activities could have on resources under NMFS' jurisdiction. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review 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),[57] which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

[57] "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."

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 availability to injury and mortality. Impacts could occur from changes to the habitat in the areas of wind turbines and cable corridors and increased vessel traffic to and from those areas. Species that reside in affected wind farms year round may experience different impacts than species that seasonally reside in or migrate through those 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. 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. Taorima et al. (2018) provide a recent review of various cable impacts, and Hutchinson et al. (2020) and Taorima et al. (2020) examine the effects of electromagnetic fields in particular.

The full buildout of offshore wind farms will result in broad habitat alteration. The wind turbines will alter hydrodynamics of the area, which may affect primary productivity and physically change the distribution of prey and larvae. It is not clear how these changes will affect the reproductive success of marine resources. Scour and sedimentation could have negative effects on egg masses that attach to the bottom. Benthic habitat will be altered due to the placement of scour protection at wind turbine foundations, and over cables that are not buried to target depth in the sediment, converting soft substrates into hard substrates. This could alter species composition and predator/prey relationships by increasing favorable habitat for some species and decreasing habitat for others. The placement of wind turbines will also establish new vertical structure in the water column, which could serve as reefs for bottom species, fish aggregating devices for pelagic species, and substrate for the colonization of other species (e.g., mussels). Various authors have studied these types of effects (e.g., Bergström et al. 2013, Dannheim et al. 2019, Degraer et al. 2019, Langhamer 2012, Methratta 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.[58] 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

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

species via behavioral medication (i.e., avoidance, startle, spawning) or injury (i.e., 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)[59] (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[60] 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.

Impacts of Offshore Wind Energy Development on Socioeconomic Resources

One offshore wind pilot project off Virginia installed two turbines in federal waters 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 21). 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) and more projects are likely to come. 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 9 and 10 (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

[59] See NMFS Ocean Noise Strategy Roadmap (footnote #57 on page 177).
[60] Changes in required flight altitudes due to proposed turbine height would affect aerial survey design and protocols (BOEM 2020a).

within these areas. Figures 22 and 23 show the surfclam and ocean quahog and clam dredge gear revenues (2012-2016), respectively. 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 among wind turbines, depending on the spacing and orientation of the array and weather conditions.[61] If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative socioeconomic impacts to affected communities, including 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 would 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 and physiological impacts is based on the specific 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,

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

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.

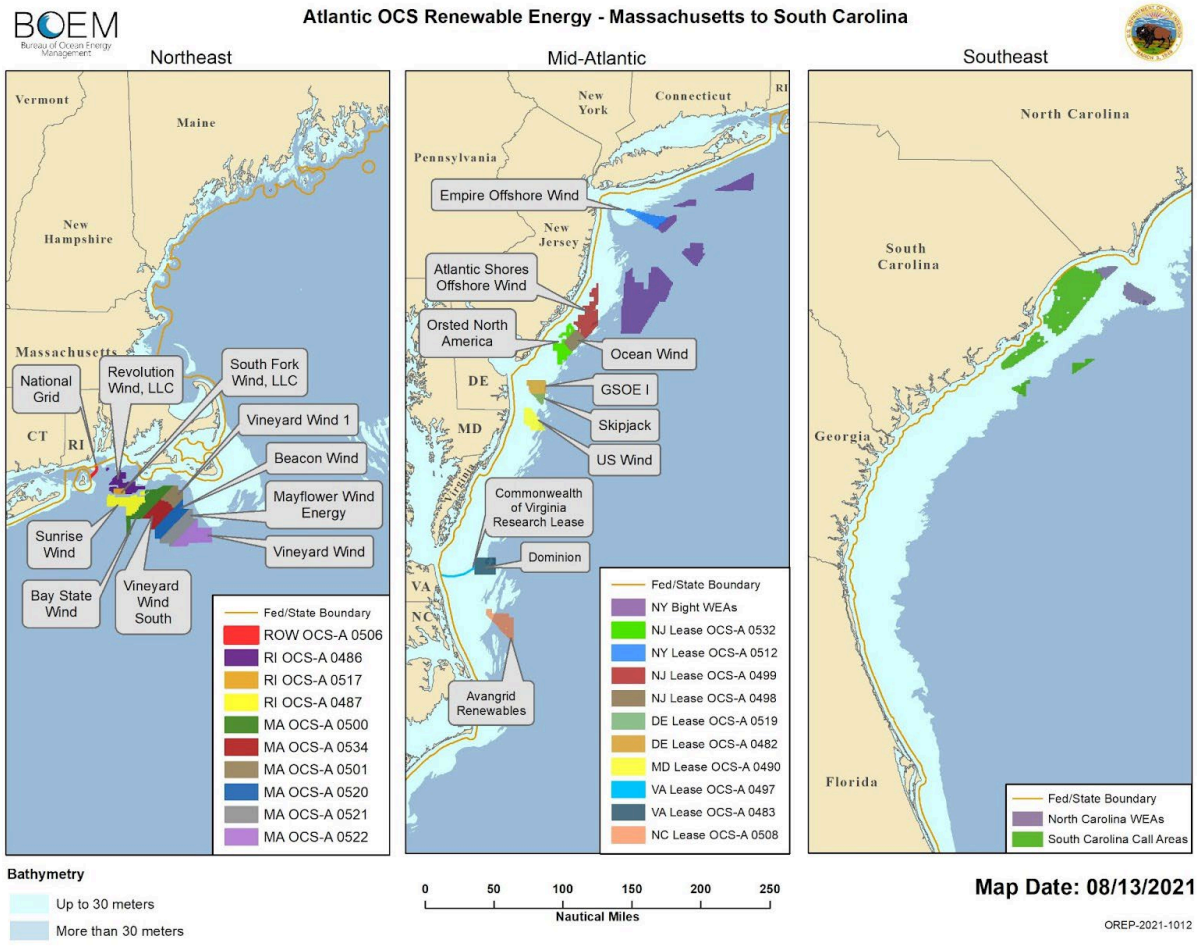


Figure 21. Map of BOEM wind planning areas, wind energy areas, and wind leasing areas on the Atlantic outer continental shelf. Source: BOEM

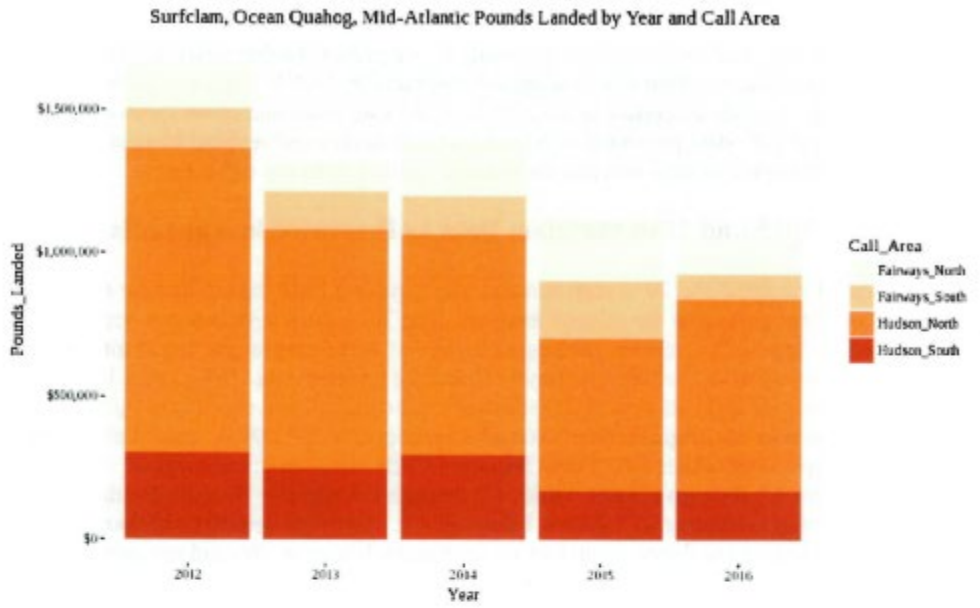


Figure 5.2 Surfclam and Ocean Quahog (Mid-Atlantic) FMP Revenue

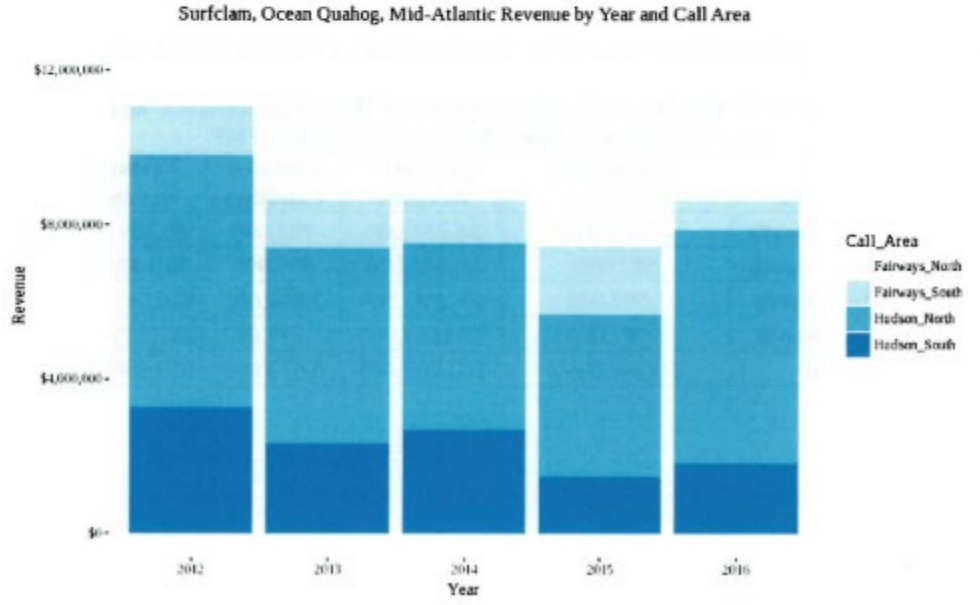


Figure 22. Surfclam and Ocean Quahog FMP landings and revenues (2012-2016) relative to wind energy call areas. Approximate revenues are based on VTR data. Source: Letter from Michael Pentony to Luke Feinberg dated July 30, 2018.

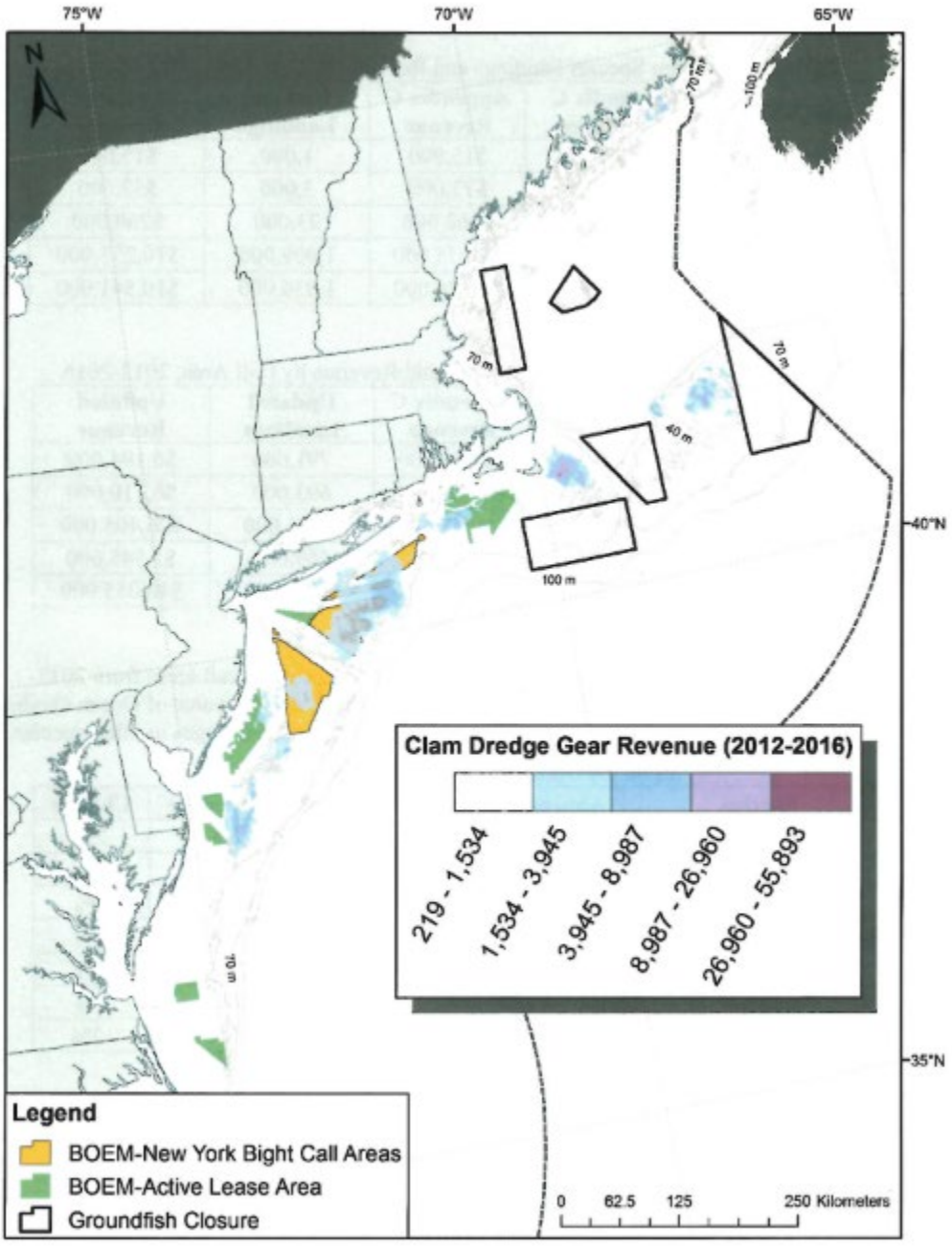


Figure 23. Sum of Surfclam and Ocean Quahog FMP revenues (2012-2016) relative to wind energy call areas and active lease areas. Approximate revenues are based on VTR data. Source: Letter from Michael Pentony to Luke Feinberg dated July 30, 2018.

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. Shift 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 depts 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).[62]

Overall climate vulnerability results for additional Greater Atlantic species, including some of the non-target species identified in this action, are shown in Figure 21 (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 outsider 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).

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

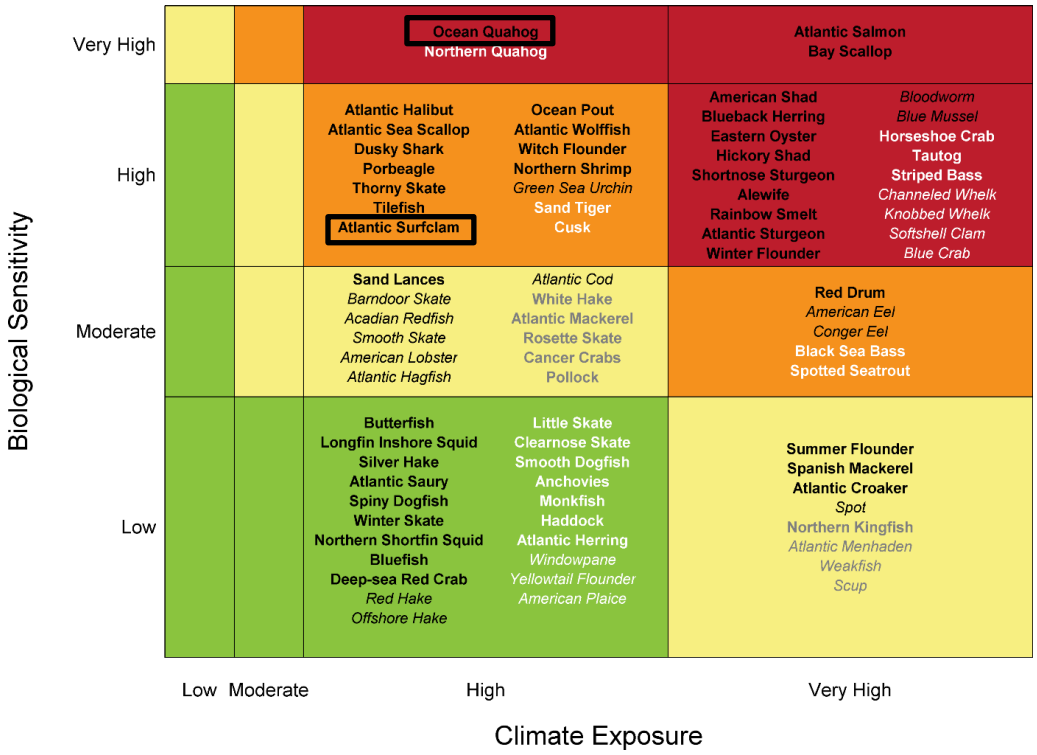


Figure 24. Overall climate vulnerability score for Greater Atlantic species, with surfclam and ocean quahog highlighted with black boxes. Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and 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.

7.5.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative effects 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). 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 morality, 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 the non-fishing impacts section, non-fishing impacts on the VECs generally range from no impact to slight negative.

7.5.5.1 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 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 described in section 7.5.4 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.

As described in section 7.1, the proposed actions in this document are purely administrative 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 proposed actions are expected to have no impact (direct or indirect) on the target species (managed species) or non-target species. 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 7.5.4.).

7.5.5.2 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 described in section 7.5.4 will result in additional direct or indirect positive effects on habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends.

Many additional non-fishing activities, as described above in section 7.5.4, 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 7.2, the proposed actions in this document are purely administrative 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 proposed actions are expected to have no impact (direct or indirect) on habitat. 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 (section 7.5.4.).

7.5.5.3 Magnitude and Significance of Cumulative Effects on Protected Species

As indicated in section 6.3.1, 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 impact 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).

As described in section 7.3, the proposed actions in this document are purely administrative 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. Taking into consideration the above information, past fishery management actions taken through the respective FMPs and annual specifications process have had slight indirect positive cumulative effects on protected species. The actions have constrained fishing effort both at a large scale and locally, and have implemented, pursuant to the ESA, MMPA, or MSA, gear modifications, requirements, and management areas. These measures and/or actions have served to reduce interactions between protected species and fishing gear. It is anticipated that future management actions, described in section 7.5.4 will result in additional indirect slight positive effects on protected species. These impacts could be broad in scope.

7.5.5.4 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 7.5.4 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.

As described in section 7.1, the proposed actions in this document are purely administrative 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. However, it is anticipated that impacts of the preferred excessive shares cap alternative would range from no impact in the short-term to positive impacts in the long-term as it provides protection against excessive consolidation and associated market power and social issues. Overall, the relevant past, present, and reasonably foreseeable future actions, including the proposed action, are cumulatively expected to range from slight negative non-significant slight positive impacts on human communities (section 7.5.4.).

7.5.6 Preferred 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 7.4 and summarized in the Executive Summary (section 1.2). 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 (section 7.5.5).

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 Council-preferred excessive shares cap level alternative is expected to have impact on human communities that range from no impact in the short term to positive impact in the long-term as this alternative is intended to prevent a firm or entity from exerting market power. In addition, the Council-preferred excessive shares cap level alternative is expected to have no impact on surfclam and ocean quahog, non-target species, habitat, or protected species due to their administrative nature. These measures are part of a broader management scheme for surfclam and ocean quahog. This management scheme has considered the intent of fisheries management as prescribed through the National Standards of the MSA, including both social and economic concerns.

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 22). Cumulatively, through 2027, 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 22. Magnitude and significance of the cumulative, additive, and synergistic effects of the preferred alternatives, as well as past, present, and reasonably foreseeable future actions.

VEC	Current Status	Net Impact of Past, Present, and Reasonably Foreseeable Future Actions	Impact of the Preferred Actions	Significant Cumulative Effects
Surfclam and ocean quahog	Positive (section 6.1.1 and 6.1.2)	Positive (section 7.5.5.1)	Excessive shares cap sub-alt. 4.4, No Impact (section 7.1.1) Excessive shares review Alt. 2, No Impact (section 7.1.2) Framework adjustment process Alt. 1, No Impact (section 7.1.3) Multi-year management measures Alt. 2, No Impact (section 7.1.4)	**None**
Non-target Species	Positive or unknown, depending on the species (section 6.1.3)	Positive (section 7.5.5.1)	Excessive shares cap sub-alt. 4.4, No Impact (section 7.1.1) Excessive shares review Alt. 2, No Impact (section 7.1.2) Framework adjustment process Alt. 1, No Impact (section 7.1.3) Multi-year management measures Alt. 2, No Impact (section 7.1.4)	**None**
Habitat	Impacted by a variety of fishing and non-fishing activities (section 6.2)	Slight negative to slight positive (section 7.5.5.2)	Excessive shares cap sub-alt. 4.4, No Impact (section 7.2.1) Excessive shares review Alt. 2, No Impact (section 7.2.2) Framework adjustment process Alt. 1, No Impact (section 7.2.3) Multi-year management measures Alt. 2, No Impact (section 7.2.4)	**None**
Protected Species	Varies by species (section 6.3)	Slight Positive for most (section 7.5.5.3)	Excessive shares cap sub-alt. 4.4, No Impact (section 7.3.1) Excessive shares review Alt. 2, No Impact (section 7.3.2) Framework adjustment process Alt. 1, No Impact (section 7.3.3) Multi-year management measures Alt. 2, No Impact (section 7.3.4)	**None**
Human Communities	Important commercial fisheries for both species. Managed under an ITQ system (section 6.4)	Slight negative to slight positive (section 7.5.5.4)	Excessive shares cap sub-alt. 4.4, No Impact in the short-term to Positive Impacts in the long-term (section 7.3.4) Excessive shares review Alt. 2, No Impact to Slight Positive (section 7.3.4) Framework adjustment process Alt. 1, No Impact to Slight Negative (section 7.3.4) Multi-year management measures Alt. 2, No Impact. However, expected to provide for better consistency and administrative efficiency (section 7.3.4)	**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 insure 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.

8.2 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.

The preferred alternatives for the excessive shares cap level, multi-year management measures, periodic review of the excessive shares measures, and frameworkable provisions of the FMP, are all consistent with the FMP objectives and the MSA National Standards. The actions proposed through this 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 preferred alternatives are expected to have no impact (direct or indirect) on the target species (managed species) or non-target species caught in the surfclam and ocean quahog fisheries. They are not expected to impact the status of the managed species or to change the stock status of any non-target species compared to current conditions. Furthermore, since the preferred alternatives are not expected to impact fishing effort or fishing practices, they are also not expected to change the status of any protected species and they are not expected to cause substantial additional damage to physical habitat, beyond that caused by many fisheries which have operated in the affected environment for many years.

In regard to the human community VEC, the preferred alternatives are not expected to cause any significant impact compared to current conditions. As previously indicated, the preferred alternatives are expected to have no impact on fishing methods and practices. As such, no changes in ex-vessel revenues are expected when compared to current conditions. However, there are indirect positive long-term impacts associated from the preferred alternatives, as they 1) provide protection against excessive consolidation and associated market power and social issues, 2)allow for periodic review of excessive shares measures that the Council adopted (would permit the Council to review their measures to determine if conditions in the fisheries changed over time and warranted revisions, and, 3) allow for administrative efficiencies by reducing the need to create and implement multiple specification documents to set management measures for the fisheries between stock assessments.

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

The preferred alternatives are not expected to alter the manner in which the industry conducts fishing activities. Therefore, no changes in fishing behavior that would affect safety are anticipated. The preferred alternatives 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?

It is not likely that the preferred alternatives would result in substantial impacts to unique areas. Many types of fishing occur in the impacted areas. The actions proposed through this 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. Therefore, the preferred alternatives are not expected to result in a change to the spatial and/or temporal scope of fishing effort. Although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid interactions between fishing gear and physical structures due to the potential loss or entanglement of fishing gear.

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 will establish an excessive shares cap level, multi-year management measures, periodic review of the excessive shares measures, and frameworkable provisions of the FMP. In identifying the excessive shares cap level, the Council considered the intent of fisheries management as prescribed through the National Standards of the MSA, including both social and economic concerns. As indicated in section 4.0, the surfclam and ocean quahog fisheries are the only federally-managed fisheries in the country that do not have measures to limit share accumulation. Because these measures are not novel and are all modeled after successfully implemented actions, the scientific basis for 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 preferred alternatives on the human environment are described in section 7.0. The preferred alternatives are not expected to alter fishing methods or activities or to change fishing effort or the spatial and/or temporal distribution of current fishing effort. The impacts to target, non-target, and protected species, as well as to habitats and human communities, will continue to be monitored. The preferred alternatives 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 will establish an excessive shares cap level, multi-year management measures, periodic review of the excessive shares measures, and frameworkable provisions of the FMP. All these administrative measures are consistent with those in place in other federal marine fisheries; they are not novel or unique. None of the preferred alternatives 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 7.5, 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 will establish an excessive shares cap level, multi-year management measures, periodic review of the excessive shares measures, and frameworkable provisions of the FMP. The preferred alternatives are not expected to alter fishing methods or activities or to change fishing effort or the spatial and/or temporal distribution of current fishing effort. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels try to avoid fishing interactions between fishing gear and physical structures, including shipwrecks, due to possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternatives 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 documented interactions between ESA-listed species and hydraulic clam dredge gear, the preferred alternatives are not expected to impact ESA listed species. In addition, as provided in section 6.3.1, 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 will establish an excessive shares cap level, multi-year management measures, periodic review of the excessive shares measures, and frameworkable provisions of the FMP. None of the proposed measures 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. In fact, the preferred measures have been found to be consistent with other applicable laws (sections 8.3-8.10).

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

The commercial fisheries for surfclam and ocean quahog are prosecuted with hydraulic clam dredges. As described in section 7.0, because of the administrative nature of this action, none of the proposed measures is 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. Based on this

information, and the fact that there have never been documented interactions between MMPA protected species and hydraulic clam dredge gear, the preferred alternatives are not expected to impact MMPA protected species (section 6.3.1). 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. None of the proposed measures is expected to alter fishing methods or activities. Because of the administrative nature of this action, none of the proposed measures is 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. As such, the proposed action 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. As previously stated, the commercial fisheries are primarily prosecuted with clam dredges, a type of bottom tending mobile gear, which can adversely impact EFH (section 6.2.3).

As described in section 7.0, none of the proposed measures is expected to alter fishing methods or activities. Because of the administrative nature of this action, none of the proposed measures is 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 proposed actions are expected to result in no impacts to habitat (section 7.2).

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 Federal Register 90246; December 14, 2016). A proposed rule to establish similar coral protections off New England published on January 2, 2020 (85 Federal Register 285).

The preferred alternatives are not expected to alter 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.)?

The impacts of surfclam and ocean quahog fisheries on biodiversity and ecosystem functioning have not been assessed; however, the impacts to components of the ecosystem (e.g., non-target species, habitat, and protected species) have been considered. As described in section 7.0, this action will establish an excessive shares cap level, multi-year management measures, periodic review of the excessive shares measures, and frameworkable provisions of the FMP. These measures are administrative in nature and are not expected to alter fishing methods or activities. None of the proposed measures is expected to increase fishing 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). They are, however, not expected to contribute to the recovery of any endangered or threatened species. 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 will establish an excessive shares cap level, multi-year management measures, and periodic review of the excessive shares measures. This action is administrative in nature and there is no evidence or indication that these fisheries have ever resulted in the introduction or spread of nonindigenous species. None of the proposed measures is expected to alter fishing methods or activities. 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 Environmental Assessment prepared for the Excessive Shares Amendment, it is hereby determined that these measures will not significantly impact the quality of the human environment as described 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 Environmental Impact Statement for this action is not necessary.

_____ _____

Regional Administrator for GARFO, NMFS, NOAA *Date*

8.3 Endangered Species Act

Sections 6.3 and 7 should be referenced for an assessment of the impacts of the proposed action on ESA-listed and MMPA protected resources. None of the actions proposed in this document are

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. Therefore, this action is not expected to affect endangered or threatened species or critical habitat in any manner not considered in previous consultations on these fisheries.

8.4 Marine Mammal Protection Act

Sections 6.3 and 7 should be referenced for an assessment of the impacts of the proposed action on marine mammals protected under the MMPA. None of the actions proposed in this document are 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. 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 has developed this amendment and will submit it to NMFS; NMFS must determine whether this action is consistent to the maximum extent practicable with the CZM programs for each state (Maine 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 amendment provided many opportunities for public review, input, and access to the rulemaking process. This action and the proposed measures were developed through a multi-stage process that was open to review by affected members of the public. While the Council intended to develop an Environmental Assessment for this action, four scoping meetings were conducted to inform interested parties of the proposed actions and alternatives to be addressed, and to solicit comments on the range of issues, type of analysis, and information that should be considered during the development of the amendment.

The scoping process was conducted from July 10, 2017 through July 21, 2017. Four public scoping hearings were conducted in: Warwick (RI), Cape May (NJ), Berlin (MD), plus an internet webinar. The scoping document is available at: http://www.mafmc.org/actions/scoq-excessive-shares-amendment and the comments/comment summary are available under "Briefing Materials (Tab 1)" at: http://www.mafmc.org/briefing/august-2017.

The public also had the opportunity to comment during the public hearing period held from August 1, 2019 through September 14, 2019. Four public hearings were conducted in Cape May (NJ), Salisbury (MD), Warwick (RI), plus an internet webinar. The public hearing document is available at: http://www.mafmc.org/actions/scoq-excessive-shares-amendment and the comments/comment summary are available under "Briefing Materials (Tab 5)" at: http://www.mafmc.org/briefing/december-2019.

The public had the opportunity to review and comment on development of the amendment during the following Fishery Management Action Team Meetings, Surfclam and Ocean Quahog Committee and Surfclam, Ocean Quahog Advisory Panel Meetings, and Council Meetings:

- June 6-8, 2017 Council meeting in Norfolk, VA
- August 8-10, 2017 Council meeting in Philadelphia, PA
- September 20, 2017 Fishery Management Action Team meeting in Providence, RI
- October 10-12, 2017 Council meeting (Goals and Objectives Workshop) in Riverhead, NY
- May 14, 2018 Fishery Management Action Team meeting in Boston, MA
- June 5-7, 2018 Council meeting in Philadelphia, PA
- April 8-11, 2019 Council meeting in Avalon, NY
- June 4-6, 2019 Council meeting in New York, NY
- September 17, 2019 Surfclam and Ocean Quahog Committee meeting in Philadelphia, PA
- September 17, 2019 Surfclam and Ocean Quahog Advisory Panel meeting in Philadelphia, PA
- December 9-12, 2019 Council meeting in Annapolis, MD

The public will have further opportunity to comment on this amendment and the proposed management measures once NMFS publishes a request for comments notice in the *Federal Register*.

8.7 Section 515 (Data Quality Act)

Utility of Information Product

This action proposes measures that ensure that no individual, corporation, or other entity acquires an excessive share of the surfclam and ocean quahog ITQ privileges. This action also revises the process for specifying multi-year management measures, and requires periodic review of the excessive shares measures, and to allow adjustments to the made under the frameworkable provisions of the FMP. In addition, this amendment revises the management objectives for the Atlantic Surfclam and Ocean Quahog FMP. 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 (if applicable). As such, this document enables the implementing agency (NMFS) to make a decision on implementation and this document serves as a supporting document for the proposed rule.

The action contained within this amendment 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 (section 8.6). In addition, the public will have further opportunity to comment on this amendment once NMFS publishes a request for comments notice in the Federal Register.

Integrity of Information Product

The information product meets the standards for integrity under Other/Discussion types of documents (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 Marine Mammal Protection Act).

Objectivity of Information Product

The category of information product that applies here is "Natural Resource Plans." Section 8.0 describes how this document was developed to be consistent with any applicable laws, including MSA. The analyses used to develop the alternatives (i.e., policy choices) are based upon the best scientific information available. The most up to date information was 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 other information 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 amendment 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 non-economic social sciences. The MAFMC review process involves staff technical experts and 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 laws. Final approval of the amendment and clearance of the rule is conducted by staff at NMFS 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 document does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order (EO) 13132.

8.10 Initial Regulatory Flexibility Act and Regulatory Impact Review

This section provides analysis to address the requirements of Executive Order 12866 (Regulatory Planning and Review) and the Regulatory Flexibility Act. These two mandates are addressed together as many of their requirements are duplicative. In addition, many of their requirements duplicate those of the MSA and/or NEPA; therefore, this section contains several references to previous sections of this document.

8.10.1 Basis and Purpose of the Rule and Summary of Preferred Alternatives

The basis of the rules proposed in this action are the provisions of the MSA for federal fishery management to ensure that no individual, corporation, or other entity acquires an excessive share of the Atlantic surfclam and ocean quahog ITQ privileges. The purpose and need for this action is further described in section 4.1. Section 4.2 lists the Council's goals and objectives for the surfclam and ocean quahog fisheries, and section 4.3 lists other amendments and FMP modifications taken to manage these fisheries. While a full description of all alternatives is provided in section 5.0, to assist with further evaluation of the measures proposed in this document, the following is a brief summary of the preferred alternatives selected by the Council for this action:

Excessive Shares Cap
Sub-alternative 4.4, Two-part cap – quota share ownership cap and second, higher cap based on possession of cage tags; Surfclam: 35/65% and Ocean quahog: 40/70%. In addition, the Council selected the family affiliate level and the cumulative 100% model for tracking of ownership.

Excessive Shares Review
Alternative 2: Require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed.

Framework Adjustment Process
Alternative 1 (No Action/*Status Quo*): No changes to the list of management measures that can be addressed via the framework adjustment process.

Multi-Year Management Measures
Alternative 2: Specifications to be set for maximum number of years needed to be consistent with the Northeast Regional Coordinating Council (NRCC)-approved stock assessment schedule).

8.10.2 Initial Regulatory Flexibility Act

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 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 frequently has a bearing on its ability to comply with a Federal regulation. 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 Regulatory Flexibility Act emphasizes predicting significant adverse impacts on small entities as a group distinct from other entities, as well as consideration of alternatives that may minimize negative impacts to small entities, while still achieving the objective of the action (section 8.10.4). When an agency publishes a proposed rule, it must either, (1) certify that the action will not have a significant adverse impact on a substantial number of small entities, and support such a certification with a factual basis demonstrating this outcome, 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.

The primary purpose of this action is to implement measures (i.e., Excessive Shares Caps) under the MSA to ensure that no individual, corporation, or other entity acquires an excessive share of the Atlantic surfclam and ocean quahog ITQ privileges. In an economic context, excessive consolidation is a level that moves the competitive condition in the market from one of pure competition to a situation where one or more firms can exert power in the output market (monopoly/oligopsony), or input market (monopsony/oligopsony). In the case of a quota market, it is one where we move from a condition of many buyers and sellers, to one where only a few buyers and sellers exist. In a social context, it is level that results in a less diverse population of participants in the harvesting or processing sectors of the fishery, or that impedes the continued participation of small-vessels, owners/operators, and entry-level participants.

In addition, this action includes measures to revise the process for specifying multi-year management measures. This action would allow multi-year management measures to be set for a maximum number of years needed to be consistent with the approved NRCC stock assessment schedule. This approach is expected to provide for better consistency and administrative efficiency. This action would also require periodic review of the excessive shares cap level. No changes would be made to the list of frameworkable items under this action.

The actions proposed through this 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 proposed action is not expected to result in changes to the manner in which the surfclam and ocean quahog fisheries are prosecuted, or the industry operates. The sections below provide supporting analysis to assess whether the proposed regulations will have a "significant impact on a substantial number of small entities."

8.10.2.1 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 67 allocation owners of record for surfclam and 37 for ocean quahog in 2017.[63]

[63] Detailed information on the 2017 Initial Surfclam Allocations and 2017 Initial Ocean Quahog Allocations is found in Appendix C.

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 23 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 2017 listed in Appendix C.

The FMAT used the Small Business Administration table of Small Business Size Standards matched to the NAICS Codes to categorize the 2017 initial allocation owners of record (Table 23). 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, the FMAT used publicly available information found online to assign an SBA classification to those owners of record. There were also various instances where the FMAT 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). During the development of this amendment, the Council asked for industry and public input on the categorizations made or any missing information. However, no input from the industry or public was received.

Of the 67 initial surfclam allocation owners of record for 2017, 22 were categorized as "Commercial Fishing," with 100% of them classified as small entities. Of the 11 allocation owners that were categorized as "Fish and Seafood Merchant Wholesalers," 2 were classified as small entities (18%) and 9 were classified as large entities (82%). Five allocations owners of record were categorized as "Commercial Banking," 1 was classified as small entity (20%) and 4 were classified as large entities (80%). Seven allocations owners of record were categorized as "Credit Unions," 1 was classified as small entity (14%) and 6 were classified as large entities (86%). 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 2017. There were also 3 allocation owners of record categorized as "Sector 92" (Public Administration sector); and therefore, small business size standards are not applicable for these 3 allocation owners. Lastly, the SBA classification for 17 surfclam allocation owners was unknown.

Of the 37 initial ocean quahog allocation owners of record for 2017, 19 were categorized as "Commercial Fishing," with 100% 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%) and 4 were classified as large entities (67%). Two allocations owners of record were categorized as "Commercial Banking" and 1 categorized as "Credit Unions"; with 100% 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 2017. Lastly, the SBA classification for 7 ocean quahog allocation owners was unknown.

Table 23. Small and Large surfclam and ocean quahog 2017 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	22	22	0
424460	Fish and Seafood Merchant Wholesalers	100 employees	11	2	9
522110	Commercial Banking	$550 million in assets	5	1	4
522130	Credit Unions	$550 million in assets	7	1	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	3	NA	
Ocean quahog					
114113	Commercial fishing	$11 million in revenues	19	19	0
424460	Fish and Seafood Merchant Wholesalers	100 employees	6	2	4
522110	Commercial Banking	$550 million in assets	2	0	2
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.

8.10.2.2 Economic Impacts on Regulated Entities

The actions proposed through this 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 (no changes in surfclam or ocean quahog ex-vessel revenues are expected), fishery distribution, or fishing methods and practices. The proposed action is not expected to result in changes to the manner in which the surfclam and ocean quahog fisheries are prosecuted, or the industry operates. The alternatives are described in detail in section 5.0. The economic impacts of all alternatives are described in section 7.4.

No immediate direct economic impacts are expected from the actions proposed in this amendment. However, actions proposed through this amendment may have indirect positive impacts to allocation owners of record, including small entities. For example, preferred excessive shares cap alternative (sub-alternative 4.4) is based on a two-part cap approach that limits the possession of both owned quota share and cage tags by an individual or entity; as such, it would limit the exercise of market power that could be derived through both quota share ownership and contractual control of quota. As indicated in section 7.4, if the surfclam and ocean quahog two-part cap (i.e., quota share ownership cap and second, higher cap based on possession of cage tags) levels under sub-alternative 4.4 (35/65% for surfclam and 40/70% for ocean quahog) had been implemented in 2017, all entities would have fallen below those quota share caps levels. As such, no entity would have been constrained by the cap levels under sub-alternative 4.4 in the surfclam or ocean quahog fisheries. Overall, the preferred excessive shares cap alternative will provide protection against excessive consolidation and is expected to have 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. Finally, this preferred alternative incorporates a specific limit or definition of an excessive share in the FMP as required under National Standard 4 of the MSA.

The preferred excessive shares review alternative (alternative 2) is administrative in nature. This alternative would require periodic review of the excessive shares measures at specific intervals. At least every 10 years or as needed. Having a mechanism in place to review the effectiveness of the excessive shares cap selected by the Council, would allow for a periodic review over time of the appropriateness and performance of the cap level. This is important, because an excessive shares measure established at an appropriate level now could over time become inefficiently high (offering too little constraint on the exercise of market power) or low (offering too much constraint on efficient competitive activity in the industry). Overall, the preferred excessive shares review alternative will provide a mechanism to review the excessive shares cap is expected to have impacts ranging from no impact in the short-term to positive impact in the long-term compared to current conditions, as it requires for a periodic review over time of the appropriateness and performance of the excessive shares cap level implemented by the Council.

Under the preferred alternative for framework adjustment process (alternative 1; no action/*status quo*), no changes to the list of management measures that can be addressed via the framework adjustment process will be made. This alternative will not provide the flexibility to adjust the excessive cap level (i.e., numeric cap value) implemented by the Council under frameworkable provision of the FMP, which could have the potential to reduce needed staff time and management

cost. The Council would still have the prerogative to review any implemented excessive cap level through an amendment; however, making modifications to existing regulations using an amendment process requires more work and time compared to a framework process.

The preferred multi-year management measure alternative (alternative 2) is administrative in nature. This alternative will allow specifications to be set for maximum number of years needed to be consistent with the Northeast Regional Coordinating Council approved stock assessment schedule. This approach is expected to provide for better consistency and administrative efficiency.

8.10.3 Regulatory Impact Review

Executive Order 12866 requires a Regulatory Impact Review (RIR) in order to enhance planning and coordination with respect to new and existing regulations. This Executive Order requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." The analysis included in this RIR further demonstrates that this action is not a "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy.

Executive Order 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant regulatory action is one that may:

- Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or,
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The surfclam fishery was worth between $30 million and $31 million from 2015-2017 (ex-vessel revenues). The ocean quahog was worth between $21 million and $23 million for the same time period. The proposed measures are administrative in nature and are not expected to have impacts on the prosecution of the surfclam and ocean quahog fisheries, including landings levels (no changes in surfclam or ocean quahog ex-vessel revenues are expected), fishery distribution, or fishing methods and practices. The proposed action is not expected to result in changes to the manner in which the surfclam and ocean quahog fisheries are prosecuted, or the industry operates.

This action is consistent with previous actions by the Council and NOAA Fisheries, and there is no known conflict with other agencies. There is no known impact on any entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof. There is also no known conflict with other legal mandates, the President's priorities, or the principles set forth in the

Executive Order. Making adjustments to the Council's risk policy was explicitly contemplated in previous actions so this is not precedent-setting or novel.

As such, the Proposed Action is not considered significant as defined by Executive Order 12866 given the relatively small size of this fishery and the expected impacts, at least as defined for Executive Order 12866.

8.10.4 Analysis of Non-Preferred Alternatives

When considering the economic impacts of the alternatives under the Regulatory Flexibility Act and Executive Order 12866, consideration should also be given to those non-preferred alternatives which would result in higher net benefits or lower costs to small entities while still achieving the stated objective of the action.

The preferred alternatives are listed in section 8.10.1 and described in detail in section 5.0. The only non-preferred alternative (i.e., framework adjustment process alternative 2) which could result in higher net benefits or lower costs than the preferred alternative is listed below and described in more detail in section 5.0.

Framework adjustment process alternative 2 is administrative in nature and strictly considers the expansion of the list of framework adjustment measures that have been identified in the FMP. This alternative would add adjustments to the excessive shares cap level to the list of frameworkable actions in the FMP. This frameworkable item would allow modifications to the numeric cap value only (e.g., increasing or decreasing cap values from X% to Y%) and not the underlying cap system (e.g., changing single cap system approach to a two-part cap approach or model or affiliation level used to implement cap). The proposed alternative would provide flexibility to address potential modifications to any implemented excessive cap level if it becomes inefficiently high or low through time as fisheries conditions change. Alternative 2 is expected to result in socioeconomic impacts that range from no impact to slight positive. Compared to preferred alternative 1, alternative 2 is expected to have slight positive socioeconomic impacts because this alternative provides the flexibility to adjust any implemented excessive cap level if it becomes inefficiently or low through time as fisheries conditions change, and this has the potential to reduce needed staff time and management cost.

9.0 LITERATURE CITED

AWEA (American Wind Energy Association). 2020. U.S. Offshore Wind Power Economic Impact Assessment. https://supportoffshorewind.org/wp-content/uploads/sites/6/2020/03/AWEA_Offshore-Wind-Economic-ImpactsV3.pdf. 19 p.

Asche, F. and T. Bjørndal. 2003. Demand elasticities for fish: A review. Center for Fisheries Economics. Norwegian School of Economics and Business Administration. Hellevein 30N-5045, Bergen, Norway.

ASMFC (Atlantic States Marine Fisheries Commission). 2017. 2017 Atlantic sturgeon benchmark stock assessment and peer review report. October 18, 2017. 456 p.

ASSRT (Atlantic Sturgeon Status Review Team). 2007. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007. 174 p.

Awk, R. 1988. Microeconomic: Theory and applications. A Wiley/Hamilton Publication, John Wiley & Sons, Inc. 492 p.

Bailey, H., K.L. Brookes, and P.M. Thompson. 2014. Assessing environmental impacts of offshore wind farms: lessons learned and recommendations for the future. *Aquatic Biosystems* 10(8): 1-13.

Bailey, H., B. Senior, D. Simmons, J. Rusin, G. Picken, and P.M. Thompson. 2010. Assessing underwater noise levels during pile-driving at an offshore windfarm and its potential effects on marine mammals. *Marine Pollution Bulletin* 60: 888–897.

Baumgartner, M.F., C.A. Mayo, and R.D. Kenney 2007. Enormous carnivores, microscopic food, and a restaurant that's hard to find. In "The Urban Whale: North Atlantic Right Whales at the Crossroads" (S.D. Kraus and R.M. Rolland, eds.), pp. 138–171 . Harvard University Press, Cambridge, MA.

Bergström, L., L. Kautsky, T. Malm, R. Rosenberg, M. Wahlberg, N.Å. Capetillo, and D. Wilhelmsson. 2014. Effects of offshore wind farms on marine wildlife—a generalized impact assessment. *Environmental Research Letters* 9(3): 1-12.

Bergström, L., F. Sundqvist, and U. Bergström. 2013. Effects of an offshore wind farm on temporal and spatial patterns in the demersal fish community. *Marine Ecology Progress Series* 485: 199-210.

Bureau of Ocean and Energy Management (BOEM). 2020a. *Vineyard Wind 1 Offshore Wind Energy Project Supplement to the Draft Environmental Impact Statement.* Appendix A.

Bureau of Ocean and Energy Management (BOEM). 2020b. *Oil and Gas Energy Fact Sheet*. https://www.boem.gov/sites/default/files/documents/oil-gas-energy/BOEM_FactSheet-Oil%26amp%3BGas-2-26-2020.pdf. 2 pp.

Brinson, A.A. and E.M. Thunberg. 2013. The economic performance of U.S. catch share programs. U.S. Dept Commer, NOAA Tech Memo NMFS-F/SPO-133, 160 p.

Brinson, A.A. and E.M. Thunberg. 2016. Performance of federally managed catch share fisheries in the United States. *Fish Res*. 2016;179:213–223.

Caillouet, C.W., S.W. Raborn, D.J. Shaver, N.F. Putman, B.J. Gallaway, and K.L. Mansfield. 2018. Did declining carrying capacity for the Kemp's ridley sea turtle population within the Gulf of Mexico contribute to the nesting setback in 2010-2017? Chelonian Conservation and Biology 17(1): 123-133.

Cargnelli L.M., S.J. Griesbach, D.B. Packer, and E. Weissberger. 1999a. Essential Fish Habitat Source Document: Atlantic surfclam, *Spisula solidissima*, Life History and Habitat Characteristics. NOAA Tech Memo NMFS NE 142; 13 p.

Cargnelli L.M., S.J. Griesbach, D.B. Packer, and E. Weissberger. 1999b. Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Characteristics. NOAA Tech Memo NMFS NE 148; 20 p.

Chute, T. Personal Communication. November 15, 2017. NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

Davis, C.S. 1987 Zooplankton life cycles "In: Backus, R.H., Bourne, D.W. (Eds.), Georges Bank. MIT Press, Cambridge, MA" pp. 254-267.

Dannheim, J., L. Bergström, S.N.R. Birchenough, R. Brzana, A.R. Boon, J.W.P. Coolen, J.-C. Dauvin, I. De Mesel, J. Derweduwen, A.B. Gill, Z.L. Hutchison, A.C. Jackson, U. Janas, G. Martin, A. Raoux, J. Reubens, L. Rostin, J. Vanaverbeke, T.A. Wilding, D. Wilhelmsson, S. Degraer, and J. Norkko. 2019. Benthic effects of offshore renewables: identification of knowledge gaps and urgently needed research. *ICES Journal of Marine Science.*

Degraer, S., R. Brabant, B. Rumes, and L. Vigin. 2019. Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Marking a Decade of Monitoring, Research, and Innovation. Memoirs on the Marine Environment, Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management: 134.

Ellison, W.T., B.L. Southall, C.W. Clark, and A.S. Frankel. 2011. A new context-based approach to assess marine mammal behavioral responses to anthropogenic sounds. *Conservation Biology* 26: 21-28.

Ellison, W.T., B.L. Southall, A.S. Frankel, K. Vigness-Raposa, and C.W. Clark. 2018. Short Note: An Acoustic Scene Perspective on Spatial, Temporal, and Spectral Aspects of Marine Mammal Behavioral Responses to Noise. *Aquatic Mammals* 44(3): 239-243.

Färe, R., S. Grosskopf, and J. Walden. 2015. Productivity change and fleet restructuring after transition to individual transferable quota management. *Marine Policy* 62 (December):318-325.

Finneran, J.J. 2015. Noise-induced hearing loss in marine mammals: a review of temporary threshold shift studies from 1996 to 2015. *J. Acoust. Soc. Am.* 138, 1702–1726. doi: 10.1121/1.4927418

Finneran, J.J. 2016. Auditory Weighting Functions and TTS/PTS Exposure Functions for Marine Mammals Exposed to Underwater Noise, Technical Report 3026, December 2016. San Diego: Systems Center Pacific.

Forney, K.A., B.L. Southall, E. Slooten, S. Dawson, A.J. Read, R.W. Baird, and R.L. Brownell Jr. 2017. Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity. *Endang. Species. Res.* 32: 391–413.

Gaichas, S., J. Hare, M. Pinsky, G. DePiper, O. Jensen, T. Lederhouse, J. Link, D. Lipton, R. Seagraves, J. Manderson, and M. Clark. 2015. Climate change and variability: a white paper to inform the Mid-Atlantic Fishery Management Council on the impact of climate change on fishery science and management. Second draft. http://www.mafmc.org/eafm/

Greene, J.K., M.G. Anderson, J. Odell, and N. Steinberg, eds. 2010. The Northwest Atlantic Marine Ecoregional Assessment: Species, Habitats and Ecosystems. Phase One. The Nature Conservancy, Eastern U.S. Division, Boston, MA. www.conservationgateway.org

Hare, J.A., W.E. Morrison, M.W. Nelson, M.M. Stachura, E.J. Teeters, R.B. Griffis, et al. 2016. A Vulnerability Assessment of Fish and Invertebrates to Climate Change on the Northeast U.S. Continental Shelf. PLoS ONE 11(2). http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0146756

Hennen, D. Personal Communication. March 22, 2018. NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

Heppell, S.S., D.T. Crouse, L.B. Crowder, S.P. Epperly, W. Gabriel, T. Henwood, R. Marquez, and N.B. Thompson. 2005. A population model to estimate recovery time, population size, and management impacts on Kemp's ridley sea turtles. Chelonian Conservation and Biology 4(4): 767-773.

Hutchison, Z.L., A.B. Gill, P. Sigray, H. He, and J.W. King. 2020. Anthropogenic Electromagnetic Fields (EMF) Influence the Behaviour of Bottom-Dwelling Marine Species. Scientific Reports 10 (1): 4219.

Johnson, M.R., C. Boelke, L.A. Chiarella, and K. Greene. 2019. Guidance for Integrating Climate Change Information in Greater Atlantic Region Habitat Conservation Division Consultation Processes. Greater Atlantic Region Policy Series 19-01. 235 p. https://www.greateratlantic.fisheries.noaa.gov/policyseries/index.php/GARPS/article/view/3

Johnson, C., J. Pringle, and C. Chen. 2006. Transport and retention of dormant copepods in the Gulf of Maine. Deep-Sea Research II. 53: 2520–2536.

Langhamer, O. 2012. Artificial Reef Effect in relation to Offshore Renewable Energy Conversion: State of the Art. *The Scientific World Journal*: 8.

Leftwich, R. 1973. The price system and resource allocation. The Dryer Press. Hinsdale, Illinois 60521. 433 p.

Lynch, D.R., W.C. Gentleman, D.J. McGillicuddy, and C.S. Davis. 1998. Biological/ physical simulations of *Calanus finmarchicus* population dynamics in the Gulf of Maine. Marine Ecology Progress Series. 169: 189-210.

Lucey, S.M. and J.A. Nye. 2010. Shifting species assemblages in the northeast U.S. continental shelf large marine ecosystem. *Marine Ecology Progress Series*. 415: 23-33.

Madsen, P.T., M. Wahlberg, J. Tougaard, K. Lucke, and P. Tyack. 2006. Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs. *Mar. Ecol. Prog. Ser.* 309: 279–295.

MAFMC (Mid-Atlantic Fishery Management Council). 1988. Amendment #8 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan. Dover, DE. 142 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 1998a. Amendment #10 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan. Dover, DE. 72 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 1998b. Amendment 12 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan. Dover, DE. 254 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 2003. Amendment 13 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan. Dover, DE. 344 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 2009. Overview of the Surfclam and Ocean Quahog Fisheries and Quota Considerations for 2010. Dover, DE. 25 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 2010. Surfclam and Ocean Quahog Quota Specifications for 2011, 2012, and 2013 2010. p 146 + append.

MAFMC (Mid-Atlantic Fishery Management Council). 2011. Amendment 16 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan. Dover, DE. 293 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 2013. 2014, 2015, and 2016 Atlantic Surfclam and Ocean Quahog Specifications. Dover, DE. 94 p. + append.

MAFMC (Mid-Atlantic Fishery Management Council). 2014. Workshop Report: East Coast Climate Change and Fisheries Governance Workshop. March 19-21, 2014, Washington, DC.
MAFMC (Mid-Atlantic Fishery Management Council). 2018a. Atlantic Surfclam Information Document - April 2018. Dover, DE. 15 p.

MAFMC (Mid-Atlantic Fishery Management Council). 2018b. Ocean Quahog Information Document - April 2018. Dover, DE. 15 p.

McCay, B.J. and S. Brandt. 2001. Changes in fleet capacity and ownership of harvesting rights in the United States surf clam and ocean quahog fishery. In: R. Shotton. *Case Studies on the Effects*

of Transferable Fishing Rights on Fleet Capacity and Concentration of Quota Ownership. Rome, Italy: Food and Agriculture Organization of the United Nations.

McCay, B.J., S. Brandt, and C.F. Creed. 2011. Human dimensions of climate change and fisheries in a coupled system: The Atlantic surfclam case. *ICES Journal of Marine Science* 68 (6):1354-1367.

McDonald, J. Personal Communication. July 16, 2017. Former General Council, NMFS Greater Atlantic Regional Fisheries Office (GARFO).

Meise, C.J. and J.E. O'Reilly. 1996. Spatial and seasonal patterns in abundance and age-composition of *Calanus finmarchicus* in the Gulf of Maine and on Georges Bank: 1977- 1987. Deep Sea Research II. 43(7-8):1473-1501.

Methratta, E. and W. Dardick (2019). Meta-Analysis of Finfish Abundance at Offshore Wind Farms. *Reviews in Fisheries Science and Aquaculture* 27(2): 242-260.

Mitchell, G., S. Peterson, and R. Willig. 2011. Recommendations for Excessive-Share Limits in the Surfclam and Ocean Quahog Fisheries. Compass Lexecon. Annapolis, MD.

National Research Council (NRC). 1999. Sharing the Fish: Toward a National Policy on Individual Fishing Quotas. The National Academies Press, Washington, D.C.

National Research Council (NRC). 2000. Marine Mammals and Low-Frequency Sound: Progress Since 1994. Washington, DC: National Academies Press.

National Research Council (NRC). 2003. Ocean Noise and Marine Mammals. Washington, DC: National Academies Press.

National Research Council (NRC). 2005. Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects. Washington, DC: National Academies Press.

Northern Economics, Inc. 2019. Review of the Atlantic Surfclam and Ocean Quahog Individual Transferable Quota Program. Prepared for Mid-Atlantic Fishery Management Council. http://www.mafmc.org/council-events/june-2019-council-meeting; "Briefing Materials (Tab 3)."

NEFSC (Northeast Fisheries Science Center). 2014. 59th Northeast Regional Stock Assessment Workshop (59th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-09; 782 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026. http://www.nefsc.noaa.gov/publications/

NEFSC (Northeast Fisheries Science Center). 2017a. 61st Northeast Regional Stock Assessment Workshop (61st SAW) Assessment Summary Report. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 16-13; 26 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026. http://www.nefsc.noaa.gov/publications

NEFSC (Northeast Fisheries Science Center). 2017b. 63rd Northeast Regional Stock Assessment Workshop (63rd SAW) Assessment Summary Report. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-09; 28 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026. http://www.nefsc.noaa.gov/publications

NEFSC (Northeast Fisheries Science Center). 2017c. 2016 NE skate stock status update. https://s3.amazonaws.com/nefmc.org/4_NEFSC_SkateMemo_July_2017_170922_085135.pdf

Nelms, S.E., W.E. Piniak, C.R. Weir, and B.J. Godley. 2016. Seismic surveys and marine turtles: an underestimated global threat? *Biol. Conserv.* 193, 49–65. doi: 10.1016/j.biocon.2015.10.020

NMFS (National Marine Fisheries Service) 2007. The design and use of limited access privilege programs. L. G. Anderson and M. C. Holliday (eds). U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Marine Fisheries Service. NOAA Technical Memorandum NMFS-F/SPO-86, November 2007.

NMFS (National Marine Fisheries Service). 2009. Excessive Share Issues in the Surfclam and Ocean Quahog ITQ Fishery. Northeast Fisheries Science Center. Woods Hole, MA, 28 p.

NMFS (National Marine Fisheries Service). 2012. Re-opening a portion of the Georges Bank closed area to surfclam and ocean quahog harvesting, Environmental Assessment and Regulatory Impact Review. NOAA/NMFS Northeast Regional Office, Gloucester MA, 103 p.

NMFS (National Marine Fisheries Service). 2013. Re-opening a portion of the Georges Bank closed area to surfclam and ocean quahog harvesting, Supplemental Environmental Assessment and Regulatory Impact Review. NOAA/NMFS Northeast Regional Office, Gloucester MA, 34 p.

NMFS (National Marine Fisheries Service). 2015a. Endangered Species Act Section 4(b)(2) Report: Critical Habitat for the North Atlantic Right Whale (*Eubalaena glacialis*). Prepared by National Marine Fisheries Service Greater Atlantic Regional Fisheries Office and Southeast Regional Office, December 2015.
http://www.greateratlantic.fisheries.noaa.gov/regs/2016/January/16narwchsection4_b__2_report012616.pdf

NMFS (National Marine Fisheries Service). 2015b. North Atlantic Right Whale (*Eubalaena glacialis*). Source Document for the Critical Habitat Designation: A review of information pertaining to the definition of "critical habitat" Prepared by National Marine Fisheries Service Greater Atlantic Regional Fisheries Office and Southeast Regional Office, July 2015.

NMFS (National Marine Fisheries Service). 2017a. North Atlantic right whale 5 year review. Summary and evaluation. Prepared by the National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office Gloucester, Massachusetts, October 2017.
https://www.greateratlantic.fisheries.noaa.gov/protected/final_narw_5-year_review_2017.pdf

NMFS (National Marine Fisheries Service). 2017b. Guidance for Conducting Review of Catch Share Programs. NMFS Procedural Instruction 01-121-01. Catch Share Policy 01-121. Silver Spring, MD. 18 p.

NMFS (National Marine Fisheries Service). 2021. Endangered Species Act Section 7 Consultation on the: (a) Authorization of the American Lobster, Atlantic Bluefish, Atlantic, Deep-Sea Red Crab, Mackerel/Squid/Butterfish, Monkfish, Northeast Multispecies, Northeast Skate Complex, Spiny Dogfish, Summer Flounder/Scup/Black Sea Bass, and Jonah Crab Fisheries and (b) Implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2. National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office, Gloucester, Massachusetts; May 2021.

NMFS (National Marine Fisheries Service) and USFWS (United States Fish and Wildlife Service). 2015. Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) 5-year Review: Summary and Evaluation. National Marine Fisheries Service and United States Fish and Wildlife Service, Silver Spring, Maryland.

NOAA (National Oceanic and Atmospheric Administration). 2016. Species in the Spotlight Priority Actions: 2016-2020 Atlantic Salmon (*Salmo salar*). Atlantic Salmon Five Year Action Plan.

Northwest Atlantic Leatherback Working Group. 2018. Northwest Atlantic Leatherback Turtle (*Dermochelys coriacea*) Status Assessment (Bryan Wallace and Karen Eckert, Compilers and Editors). Conservation Science Partners and the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). WIDECAST Technical Report No. 16. Godfrey, Illinois. 36 p.

Northeast Region Essential Fish Habitat Steering Committee. 2002. Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern United States, October 23-25, 2001, Boston, Massachusetts. Northeast Fisheries Science Center Reference Document 02-01; 86 p. http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0201/

Nowacek, D.P., L.H. Thorne, D.W. Johnston, and P.L. Tyack. 2007. Responses of cetaceans to anthropogenic noise. *Mamm. Rev.* 37, 81–115. doi: 10.1111/j.1365-2907.2007.00104.x

Nowacek, D.P., C.W. Clark, D. Mann, P. JO. Miller, H.C. Rosenbaum, J.S. Golden, M. Jasny, J. Kraska, and B.L. Southall. 2015. Marine seismic surveys and ocean noise: time for coordinated and prudent planning. *Front. Ecol. Environ*. 13(7): 378–386. doi:10.1890/130286

Nye, J.A., T.M. Joyce, Y.O. Kwon, and J.S. Link. 2011. Silver hake tracks changes in Northwest Atlantic circulation. *Nature Communications*. 2:412.

Palmer, D. 2017. Developing the Protected Resources Affected Environment for Environmental Assessments and Environmental Impact Statements. Greater Atlantic Region Policy Series 17-01. NMFS Greater Atlantic Regional Fisheries Office. 74 p. www.greateratlantic.fisheries.noaa.gov/policyseries/

Piniak, W.E.D. 2012. *Acoustic Ecology of Sea Turtles: Implications for Conservation*. Ph.D., Duke University.

Pinsky, M.L., B. Worm, M.J. Fogarty, J.L. Sarmiento, and S.A. Levin. 2013. Marine taxa track local climate velocities. *Science*. 341(6151): 1239-1242.

Popper, A., A. Hawkins, R. Fay, R. Mann, D. Bartol, S.T. Carlson, et al. 2014. Sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-accredited standards committee S3/SC1 and registered with ANSI. *ASA S3/SC1* 4.

Richardson, W.J., C.R. Greene, Jr., C.I. Malme, and D.H. Thomson. 1995. *Marine Mammals and Noise*. San Diego, CA: Academic Press.

Romano, T., M. Keogh, C. Kelly, P. Feng, L. Berk, C. Schlundt, et al. 2004. Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure. *Can. J. Fish. Aquat. Sci.* 61, 1124–1134. doi: 10.1139/f04-055

Seminoff, J.A., C.D. Allen, G.H. Balazs, P.H. Dutton, T. Eguchi, H.L. Hass, S.A. Hargrove, M. Jensen, D.L. Klemm, A.M. Lauritsen, S.L. MacPherson, P. Opay, E.E. Possardt, S. Pultz, E. Seney, K.S. Van Houtan, and R.S. Waples. 2015. Status review of the Green Turtle (Chelonia mydas) under the Endangered Species Act. NOAA Tech. Memo. NOAATM-NFMS-SWFSC-539, NMFS Southwest Fisheries Science Center, Miami, Florida.

Slabbekoorn, H., N. Bouton, I. van Opzeeland, A. Coers, C. ten Cate, and A.N. Popper. 2010. A noisy spring: the impact of globally rising underwater sound levels on fish. *Trends Ecol. Evol. (Amst).* 25, 419–427. doi: 10.1016/j.tree.2010.04.005

Steimle, F.W. and C. Zetlin. 2000. Reef habitats in the middle Atlantic bight: abundance, distribution, associated biological communities, and fishery resource use. *Marine Fisheries Review*. 62: 24-42.

Stenberg, C., J.G. Støttrup, M. van Deurs, C.W. Berg, G.E. Dinesen, H. Mosegaard, T.M. Grome, and S.B. Leonhard. 2015. Long-term effects of an offshore wind farm in the North Sea on fish communities. *Marine Ecology Progress Series* 528: 257-265.

Stenseth, N.C., A. Mysterud, G. Otterson, J.W. Hurrell, K. Chan, and M. Lima. 2002 Ecological Effects of Climate Fluctuations. *Science*. 297(5585); 1292-1296.

Stevenson D., L. Chiarella, D. Stephan, R. Reid, K. Wilhelm, J. McCarthy, and M. Pentony. 2004. Characterization of the fishing practices and marine benthic ecosystems of the Northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential fish habitat. Woods Hole (MA): National Marine Fisheries Service, Northeast Fisheries Science Center, NOAA Technical Memorandum NMFS-NE-181. 179 p.

Surfclam and Ocean Quahog Advisory Panel. 2016. Fishery Performance Report (FPR) May 2016. Mid-Atlantic Fishery Management Council. Dover, DE. 10 p. http://www.mafmc.org/fishery-performance-reports/

Taormina, B., J. Bald, A. Want, G. Thouzeau, M. Lejart, N. Desroy, and A. Carlier. 2018. A Review of Potential Impacts of Submarine Power Cables on the Marine Environment: Knowledge Gaps, Recommendations and Future Directions. Renewable and Sustainable Energy Reviews 96: 380–91.

Taormina, B., C. Di Poi, A. Agnalt, A. Carlier, N. Desroy, R.H. Escobar-Lux, J. D'eu, F. Freytet, and C.M.F. Durif. 2020. Impact of Magnetic Fields Generated by AC/DC Submarine Power Cables on the Behavior of Juvenile European Lobster (*Homarus Gammarus*). Aquatic Toxicology 220: 105401.

Thomsen, F., K. Lüdemann, R. Kafemann, and W. Piper. 2006. Effects of offshore wind farm noise on marine mammals and fish, biola, Hamburg, Germany on behalf of COWRIE Ltd. https://tethys.pnnl.gov/sites/default/files/publications/Effects_of_offshore_wind_farm_noise_on_marine-mammals_and_fish-1-.pdf

Thunberg, E., J. Walden, J. Agar, R. Felthoven, A. Harley, S. Kasperski, J. Lee, T. Lee, A. Mamula, J. Stephen, and A. Strelcheck. 2015 Measuring changes in multi-factor productivity in U.S. catch share fisheries, *Mar. Policy* 62; 294–301.

UCSG (United States Coast Guard). 2020. The Areas Offshore of Massachusetts and Rhode Island Port Access Route Study. 199 p. https://www.navcen.uscg.gov/pdf/PARS/FINAL_REPORT_PARS_May_14_2020.pdf.

USFWS (United States Fish and Wildlife Service) and NMFS (National Marine Fisheries Service). 2018. Recovery plan for the Gulf of Maine Distinct Population Segment of Atlantic salmon (*Salmo salar*). 74 p.

Vaughn, C. 2008. Clam plant closes, 46 laid off. Delmarvanow.com. May 14, 2008.

Walden, J. 2011. Summary of findings by the Center for Independent Experts regarding setting excessive share limits for ITQ fisheries. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 11-22; 104 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026. http://www.nefsc.noaa.gov/nefsc/publications/

Walden, J. Personal Communication. July 13, 2019. NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

Walden, J., J. Agar, R. Felthoven, A. Harley, S. Kasperski, J. Lee, T. Lee, A. Mamula, J. Stephen, A. Strelcheck, and E. Thunberg. 2014. Productivity Change in U.S. Catch Shares Fisheries. U.S. Dept. of Commer., NOAA Technical Memorandum NMFS-F/SPO-146, 137 p.

Walden, J.B., J.E. Kirkley, R. Färe, and P. Logan. 2012. Productivity change under an individual transferable quota management system. *American Journal of Agricultural Economics* 94 (4):913-928.

Wallace, D.H. and T.B. Hoff. 2005. Hydraulic clam dredge effects on benthic habitat off the northeastern United States. Amer. Fish. Soc. Symp. 41:691-693.

Wang, S. 1995. The surf clam ITQ management: An evaluation. *Marine Resource Economics* 10 (1):93-98.

Weinberg, J.R. 2005. Bathymetric shift in the distribution of Atlantic surfclams: response to warmer ocean temperature. *ICES Journal of Marine Science*. 62(7): 1444-1453.

Weninger, Q. and I.E. Strand. 2003. An empirical analysis of production distortions in the mid-Atlantic surf clam and ocean quahog fishery. *Applied Economics* 35 (10):1191-1197.

Wright, A.J., N.A. Soto, A.L. Baldwin, M. Bateson, C.M. Beale, C. Clark, et al. 2007. Do Marine mammals experience stress related to anthropogenic noise? *Int. J. Comp. Psychol.* 20, 274–316.

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,
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Appendix A

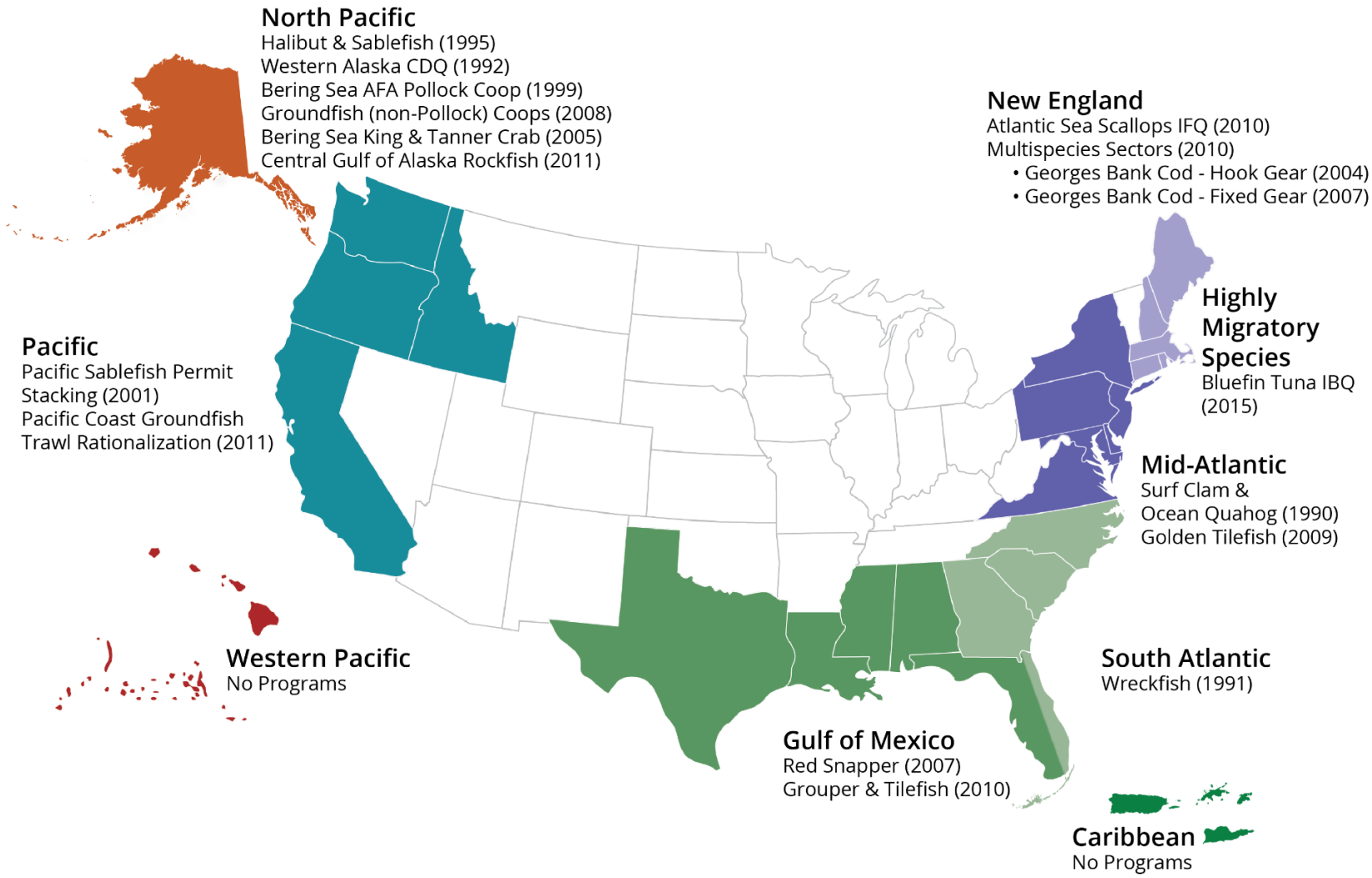
Catch Shares programs in the U.S.

"Catch shares" is a general term associated with several fisheries management strategies that dedicate a secure share of fish to individual fishermen, cooperatives, or fishing communities for their exclusive use. This appendix presents information on the geographic distribution of the 16 Catch Shares Programs throughout the country. In addition, this appendix provides a brief summary of how these programs are managed.[64]

The information presented below was provided by Lindsay Fullenkamp (NOAA) and Wendy Morrison (NOAA).

[64] For additional information please visit: https://www.fisheries.noaa.gov/national/laws-and-policies/catch-shares

Current Catch Shares Programs



Program	Excessive Share Cap
Atlantic Sea Scallops IFQ	Yes. 2.5% of annual quota pounds[65]; 5% cap on quota share[66]
Multispecies Sectors	Yes. No individual or entity can hold more than 5% of all limited access groundfish permits. Additionally, there is a limit on the aggregated average of all allocated groundfish stocks of 15.5 Potential Sector Contribution (PSC). (Each permit has a history that brings a percentage of quota to the sector the permit enrolls with.) An entity can hold PSC for a single stock in excess of 15.5%, so long as the total holdings do not exceed 232.5 PSC for all 15 species. In other words, because there are 15 groundfish stocks currently allocated to the fishery, the total PSC across all stocks used by a permit holder cannot exceed 232.5 PSC (an average PSC of 15.5% per stock multiplied by 15 groundfish stocks).
Bluefin Tuna IBQ	No. The IBQ program is designed to account for bycatch in directed pelagic longline fisheries. There are various measures in place to curtail the excessive accumulation of shares or allocation, such as no permanent sales and all leases contained within the calendar year.
Surf Clam & Ocean Quahog	No
Golden Tilefish	Yes, 49% of the tilefish IFQ total allowable landings
Wreckfish	Yes, 49% of quota share
Red Snapper	Yes, 6% of quota share
Grouper & Tilefish	Yes, quota share caps are: deep water grouper 14.7%, gag 2.3%, other shallow water grouper 7.3%, red grouper 4.3%, and tilefish 12.2%
Pacific Sablefish Permit Stacking	Yes, no individual can hold more than three permits unless meet requirements of grandfather clause.
Pacific Coast Groundfish Trawl Rationalization	Yes For IFQ, quota share limits and quota pound vessel limits (annual and daily). Limits vary by species. The 30+ categories can be found here: http://www.westcoast.fisheries.noaa.gov/publications/fishery_management/trawl_program/accumulation-limits.pdf. For the mothership cooperative program, mothership permit usage limit (no more than 45% of sector allocation). Mothership catcher vessel endorsed permit ownership limit (no more than 20% of the sector allocation).

[65] Quota pounds is the annual amount of fish a participant is allowed to catch, usually defined in terms of total weight. It is often calculated as a percentage of the commercial quota based on a participant's quota shares. It varies according to changes in the commercial quota over time.

[66] Quota share is the percentage of the sector's catch limit to which the holder of quota shares has access to harvest. This percentage is used to calculate the annual allocation, and it is not affected by changes in the catch limit over time.

Halibut & Sablefish	Yes. No one can hold or control more than 0.5%-1.5% of the halibut or sablefish quota shares in various combinations of areas (Gulf of Alaska, Bering Sea, and Aleutians) unless grandfathered in based on original landings history. There are similar restrictions on the amounts of IFQ that can be used on any single vessel.
Western Alaska CDQ	No. The Bering Sea King and Tanner Crab and Halibut Sablefish IFQ have limits on CDQ holdings, but there are no specific excessive share limits in the CDQ Program itself because the allocations were specified by Congress. However, the percentage allocated is reviewed every 10 years.
Bering Sea AFA Pollock Coop	Yes. No entity can harvest more than 17.5% or process more than 30% of the pollock directed fishery allocation.
Groundfish (non-Pollock Coops)	Yes. No single person can hold or use more than 30% of the quota share, unless grandfathered; no single vessel may catch more than 20% of the initial TAC assigned to the non-AFA trawl catcher/processor sector in any given year.
Bering Sea King & Tanner Crab	Yes. No individual or entity may hold/use more than 1-20% of shares (varies by fishery) unless grandfathered. Processors may not possess or use more than 30% of the processor shares for each fishery unless grandfathered, with some limited exceptions for specific fisheries and entities.
Central Gulf of Alaska Rockfish	Yes. There are four types of use caps to limit the amount of rockfish quota share and cooperative fishing quota, unless grandfathered. The caps can be found in Table 1 here: https://alaskafisheries.noaa.gov/sites/default/files/rockfish-faq.pdf

Appendix B

Table 1. 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

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
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
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

Species	Life Stage	Geographic Area of EFH	Depth (meters)	Bottom Type
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
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

Appendix C

2017 Initial Surfclam Allocations

and

2017 Initial Ocean Quahog Allocations

2017 Initial Surfclam Allocations											
Alloc Nbr	**Owner**	**Street**	**City**	**ST**	**Zip**	**Telephone number**	**Ratio**	**Bushels**	**Tags**	**Tag Start**	**Tag End**
C624	International Clam Management Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL	33410-6253	443-614-0377	0.133430588	453,664	14,177	85,590	99,766
C583	Singer Island Ventures Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL	33410-6253	443-614-0377	0.113054118	384,384	12,012	53,395	65,406
C632	Tristate Capital Bank Attn: Loan Operations	301 Grant St Ste 2700	Pittsburgh	PA	15219-6414	866-680-8722	0.081261176	276,288	8,634	32,214	40,847
C529	Farm Credit East, ACA Attn: Benjamin Thompson	240 South Rd	Enfield	CT	06082-4451	860-741-4380	0.076829538	261,216	8,163	75,004	83,166
C669	US DOC NOAA/NMFS Financial Services Division ITF Daniel Cohen Attn: James Plouffe	55 Great Republic Dr	Gloucester	MA	01930-2276	978-281-9154	0.060376471	205,280	6,415	1	6,415
C666	US DOC NOAA/NMFS Financial Services Division ITF Michael and Danny NOAA ITQs Attn: James Plouffe	55 Great Republic Dr	Gloucester	MA	01930-2276	978-281-9154	0.035209412	119,712	3,741	40,848	44,588
C136	Stephanie Dee Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL	33410-6253	443-614-0377	0.030776471	104,640	3,270	65,407	68,676
C660	First Niagara Bank NA ITF DPL Niagara Enterprises LLC Attn: Terri Kratz	401 Plymouth Rd Ste 600	Plymouth Meeting	PA	19462-1672	610-832-1736	0.028847059	98,080	3,065	102,811	105,875
C009	Thomas E McNulty Sr	118 Springers Mill Rd	Cape May Court House	NJ	08210-2039	609-425-8983	0.022465882	76,384	2,387	15,988	18,374
C188	Blount Fine Foods Corporation	630 Currant Rd	Fall River	MA	02720-4713	774-888-1300	0.022418824	76,224	2,382	69,079	71,460
C634	Tristate Capital Bank Attn: Loan Operations	301 Grant St Ste 2700	Pittsburgh	PA	15219-6414	866-680-8722	0.020517647	69,760	2,180	30,034	32,213
C074	Kristy Lee Clam Co	PO Box 114	Newcomb	NY	12852-0114	518-582-4572	0.020485	69,664	2,177	6,473	8,649
C546	Farm Credit East, ACA FBO JM & MT Attn: Benjamin Thompson	240 South Rd	Enfield	CT	06082-4451	860-741-4380	0.019689952	66,944	2,092	71,865	73,956
C589	Yannis Karavia LLC C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ	08316-0600	856-785-8040	0.018992941	64,576	2,018	20,513	22,530
C627	Farm Credit East, ACA Attn: Scott Kenney	240 South Rd	Enfield	CT	06082-4451	860-741-4380	0.016837647	57,248	1,789	8,650	10,438
C540	George Torggler	921 Preserve Dr	Annapolis	MD	21409-5750	410-757-8766	0.016462769	55,968	1,749	12,724	14,472

C662	Farm Credit East, ACA ITF Surfside Clam Resources LLC	29 Landis Ave	Bridgeton	NJ	08302-4317	856-451-0933	0.014305882	48,640	1,520	84,070	85,589
C663	DPL ITQs LLC	PO Box 309	Millville	NJ	08332-0309	856-300-1010	0.014051765	47,776	1,493	26,010	27,502
C528	LNA Inc	PO Box 178	Portsmouth	RI	02871-0178	401-480-2090	0.013825882	47,008	1,469	24,265	25,733
C146	Woodrow Laurence Inc	12310 Collins Rd	Bishopville	MD	21813-1528	443-497-2479	0.012935	43,968	1,374	18,375	19,748
C026	George S Carmines In Trust	103 Rens Rd	Poquoson	VA	23662-1611	757-868-9978	0.010128	34,432	1,076	11,185	12,260
C547	Farm Credit East, ACA FBO LET Attn: Benjamin Thompson	240 South Rd	Enfield	CT	06082-4451	860-741-4380	0.00985008	33,504	1,047	73,957	75,003
C004	Adriatic Inc	10127 Keyser Point Road	Ocean City	MD	21842-9165	410-213-2726	0.009173	31,200	975	101,570	102,544
C642	CCCFA Inc Attn: Seth Rolbein	1566 Main St	Chatham	MA	02633-1805	508-945-2432	0.009157647	31,136	973	100,597	101,569
C563	LET Ventures Incorporated (Ellen W LLC)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.008734118	29,696	928	51,264	52,191
C674	US DOC NOAA/NMFS Financial Services Division ITF LaVecchia and LaVecchia LLC Attn: James Plouffe	55 Great Republic Dr	Gloucester	MA	01930-2276	978-281-9154	0.007811765	26,560	830	99,767	100,596
C110	LET Ventures Incorporated (F/V Ocean Bird Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.007651765	26,016	813	47,474	48,286
C133	City of Southport Inc	854 Tern Ln Apt 103	Salisbury	MD	21804-2320	410-726-7807	0.007242	24,608	769	14,473	15,241
C552	M J Holding Co LLC	PO Box 114	Newcomb	NY	12852-0114	518-582-4572	0.007022648	23,872	746	10,439	11,184
C664	Faye Y Watson	10222 Golf Course Rd	Ocean City	MD	21842-9714	410-213-1338	0.007021176	23,872	746	15,242	15,987
C065	LET Ventures Incorporated (Sarah C Conway Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.006889412	23,424	732	46,176	46,907
C166	Nantucket Shoals Inc Attn: Albert C Rosinha Jr	147 Pine St	Rochester	MA	02770-1605	508-763-3155	0.006861176	23,328	729	22,836	23,564
C559	Sturdy Savings Bank (P & E) Attn: Commercial Loans	PO Box 900	Cape May Court House	NJ	08210-0900	609-463-5240	0.006587077	22,400	700	23,565	24,264
C655	Audubon Savings Bank ITF Cape Cod of Maryland Inc Attn: Letitia C. Baum, Senior Vice President	515 S White Horse Pike	Audubon	NJ	08106-1312	856-656-2200	0.006409412	21,792	681	83,167	83,847
C007	LET Ventures Incorporated (A & B Commercial Fish Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.006296471	21,408	669	44,589	45,257
C046	LET Ventures Incorporated (B & D Commercial Fish Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.006004706	20,416	638	45,538	46,175
C215	Leroy E and Dolores Truex	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.00592	20,128	629	49,690	50,318

C189	Anthony W Watson	10232 Golf Course Rd	Ocean City	MD	21842-9714	410-726-1317	0.005897846	20,064	627	19,749	20,375
C151	LET Ventures Incorporated (Patti B Clam Ventures Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.005628235	19,136	598	49,092	49,689
C080	TMT Allocations Inc (Leprechaun Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.005327059	18,112	566	46,908	47,473
C454	LET Ventures Incorporated (Leroy E Truex)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.005176471	17,600	550	50,319	50,868
C584	Mabel Susan III Inc	12 Rabbit Run	Cape May	NJ	08204-4423	609-884-0867	0.005072941	17,248	539	27,962	28,500
C099	Mabel Kim Inc	12 Rabbit Run	Cape May	NJ	08204-4423	609-884-0867	0.00501647	17,056	533	28,989	29,521
C033	Big Diamond Inc	12 Rabbit Run	Cape May	NJ	08204-4423	609-884-0867	0.004818824	16,384	512	29,522	30,033
C201	Anthony E and John D Martin	11014 Grays Corner Rd	Berlin	MD	21811-3160	410-641-0073	0.004356	14,816	463	12,261	12,723
C561	Roy Osmundsen	14 Whippoorwill Ln	Cape May Court House	NJ	08210-2527	609-846-3718	0.004338823	14,752	461	52,934	53,394
C134	LET Ventures Incorporated (Starlight Comm Fish Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.004178824	14,208	444	48,287	48,730
C8270	Jacek Kubiak	8 Cove Dr	North Cape May	NJ	08204-3322	609-886-4714	0.003829956	13,024	407	105,876	106,282
C149	Wando River Corporation c/o Blount Fine Foods Corporation	630 Currant Rd	Fall River	MA	02720-4713	774-888-1300	0.003806	12,928	404	71,461	71,864
C568	Daniel M Cohen	985 Ocean Dr	Cape May	NJ	08204-1855	609-884-3000	0.003783529	12,864	402	68,677	69,078
C515	Dolores Truex	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.003717647	12,640	395	50,869	51,263
C127	Gary Osmundsen	12 Rabbit Run	Cape May	NJ	08204-4423	609-884-0867	0.003529412	12,000	375	27,587	27,961
C135	T & M Clammers Inc	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.003397647	11,552	361	48,731	49,091
C079	Lauren Kim Inc	12 Rabbit Run	Cape May	NJ	08204-4423	609-884-0867	0.003077647	10,464	327	28,501	28,827
C656	Farm Credit East, ACA Attn: David A Bishop	2 Constitution Dr	Bedford	NH	03110-6000	603-472-3554	0.002870588	9,760	305	22,531	22,835
C560	Mary Patricia Price	540 Hidden Pines Blvd	New Smyrna Beach	FL	32168-8380	386-410-5168	0.002861176	9,728	304	52,630	52,933
C613	NSR Resources LLC	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.002748235	9,344	292	52,192	52,483
C638	Vongole Ragazzi LLC	48 Gorton Rd	Millville	NJ	08332-6202	856-300-1020	0.002597647	8,832	276	25,734	26,009
C229	Kenneth W and Sharon L Bailey	PO Box 12	Heislerville	NJ	08324-0012	856-777-3598	0.002503529	8,512	266	102,545	102,810
C008	LET Ventures Incorporated (F/V Amanda Tara Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.002145882	7,296	228	45,258	45,485
C661	Farm Credit East, ACA ITF Surfside Clam Resources LLC	29 Landis Ave	Bridgeton	NJ	08302-4317	856-451-0933	0.002089412	7,104	222	83,848	84,069
C071	Wyoming Boat Corporation	12 Rabbit Run	Cape May	NJ	08204-4423	609-884-0867	0.001515044	5,152	161	28,828	28,988
C075	Seafish Inc	10134 Waterview Dr	Ocean City	MD	21842-9635	443-497-3062	0.001374118	4,672	146	52,484	52,629

C063	T & P Vessel Inc	210 Hagen Rd	Cape May Court House	NJ	08210-1175	609-425-2525	0.001285	4,384	137	20,376	20,512
C629	New Sea Rover Inc ITF Blount Seafood Corporation	114 Willow Dr	Cape May	NJ	08204-3441	609-884-1080	0.000790588	2,688	84	27,503	27,586
C637	F/V Maude Platt Inc	515 Sanford Rd	Westport	MA	02790-3748	508-678-4071	0.000536471	1,824	57	6,416	6,472
C011	D & L Commercial Fish Inc	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.000489412	1,664	52	45,486	45,537

2017 Initial Ocean Quahog Allocations

Alloc Nbr	Owner	Street	City	ST	Zip	Telephone number	Ratio	Bushels	Tags	Tag Start	Tag End
Q667	Bumble Bee Foods LLC c/o Gabriel Montesano	280 10th Ave	San Diego	CA	92101-7406	858-715-4000	0.217896014	1,162,048	36,314	228,242	264,555
Q649	Singer Island Ventures Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL	33410-6253	443-614-0377	0.144435027	770,272	24,071	305,297	329,367
Q664	TD Bank NA Attn: David Nilsen, Sr. Vice President	1101 Hooper Ave	Toms River	NJ	08753-8324	732-473-2584	0.074814005	398,976	12,468	346,478	358,945
Q691	Tristate Capital Bank Attn: Loan Operations	301 Grant St Ste 2700	Pittsburgh	PA	15219-6414	866-680-8722	0.07296456	389,120	12,160	273,142	285,301
Q690	Farm Credit East, ACA ITF Surfside Clam Resources LLC	29 Landis Ave	Bridgeton	NJ	08302-4317	856-451-0933	0.052101256	277,856	8,683	336,671	345,353
Q684	ITQ LLC	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.048939059	260,992	8,156	297,040	305,195
Q199	Legend Inc	607 Seashore Rd	Cape May	NJ	08204-4615	609-884-1771	0.044270767	236,096	7,378	358,946	366,323
Q112	Wando River Corporation c/o Blount Fine Foods Corporation	630 Currant Rd	Fall River	MA	02720-4713	774-888-1300	0.043822	233,696	7,303	329,368	336,670
Q194	John Kelleher C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ	08316-0600	609-374-2466	0.039740484	211,936	6,623	221,619	228,241
Q021	Atlantic Vessels of Delaware Inc	PO Box 178	Norfolk	VA	23501-0178	757-627-7922	0.034759	185,376	5,793	267,349	273,141
Q055	Kristy Lee Clam Co	PO Box 114	Newcomb	NY	12852-0114	518-582-4572	0.033745	179,968	5,624	203,743	209,366
Q629	LET Ventures Incorporated (Ellen W LLC)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.033506094	178,688	5,584	290,238	295,821

Q006	Thomas E McNulty Sr	118 Springers Mill Rd	Cape May Court House	NJ	08210-2039	609-425-8983	0.028099756	149,856	4,683	210,774	215,456
Q576	Foxy Investments Inc C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ	08316-0600	856-785-8040	0.024823551	132,384	4,137	217,482	221,618
Q609	M J Holding Co LLC	PO Box 114	Newcomb	NY	12852-0114	518-582-4572	0.022442667	119,680	3,740	200,001	203,740
Q596	Atlantic Vessels Inc	PO Box 178	Norfolk	VA	23501-0178	757-622-9264	0.01675628	89,376	2,793	264,556	267,348
Q115	LET Ventures Incorporated (Patti B Clam Ventures Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.010134633	54,048	1,689	287,616	289,304
Q181	Thomas E McNulty Sr	118 Springers Mill Rd	Cape May Court House	NJ	08210-2039	609-425-8983	0.007926495	42,272	1,321	209,453	210,773
Q672	OSM Resources LLC	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.007306	38,976	1,218	295,822	297,039
Q598	John W Kelleher Trust C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ	08316-0600	856-785-8040	0.006786	36,192	1,131	216,351	217,481
Q676	International Clam Management Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL	33410-6253	443-614-0377	0.006402	34,144	1,067	345,354	346,420
Q005	LET Ventures Incorporated (A & B Commercial Fish Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.006348397	33,856	1,058	285,302	286,359
Q049	LET Ventures Incorporated (Sarah C Conway Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.00576036	30,720	960	286,360	287,319
Q128	LET Ventures Incorporated (F/V Ocean View Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.004920308	26,240	820	289,305	290,124
Q109	Woodrow Laurence Inc	12310 Collins Rd	Bishopville	MD	21813-1528	443-497-2479	0.003912	20,864	652	215,578	216,229
Q101	T & M Clammers Inc	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.001104069	5,888	184	287,432	287,615
Q193	Peter A LaMonica C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ	08316-0600	856-785-8040	0.000729	3,872	121	216,230	216,350
Q107	Anthony E and John D Martin	11014 Grays Corner Rd	Berlin	MD	21811-3160	410-641-0073	0.000725	3,872	121	215,457	215,577
Q174	Leroy E and Dolores Truex	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.000678042	3,616	113	290,125	290,237
Q084	LET Ventures Incorporated (B&B Shellfishing Inc)	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.000672042	3,584	112	287,320	287,431
Q685	NSR Resources LLC	PO Box 727	Manahawkin	NJ	08050-0727	609-978-1109	0.000552035	2,944	92	305,196	305,287

Q016	George S Carmines In Trust	103 Rens Rd	Poquoson	VA	23662-1611	757-868-9978	0.000519	2,752	86	209,367	209,452
Q003	Adriatic Inc	10127 Keyser Point Road	Ocean City	MD	21842-9165	410-213-2726	0.000272	1,440	45	346,433	346,477
Q669	Kenneth W Bailey	PO Box 12	Heislerville	NJ	08324-0012	856-777-3598	0.000246	1,312	41	366,324	366,364
Q658	DC Air & Seafood Inc	PO Box 581	Winter Harbor	ME	04693-0581	207-963-7139	0.000072	384	12	346,421	346,432
Q056	Seafish Inc	10134 Waterview Dr	Ocean City	MD	21842-9635	443-497-3062	0.0000543	288	9	305,288	305,296
Q143	Shellfish Inc	PO Box 86	West Sayville	NY	11796-0086	631-589-5770	0.0000121	64	2	203,741	203,742