ATLANTIC SURFCLAM AND OCEAN QUAHOG EXCESSIVE SHARES AMENDMENT

PUBLIC HEARING DOCUMENT

MARCH 2019

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

INSTRUCTIONS FOR PROVIDING PUBLIC COMMENTS

The Mid-Atlantic Fishery Management Council (MAFMC or Council) will collect public comments on the Atlantic Surfclam and Ocean Quahog Excessive Shares Issues Amendment during 4 public hearings to be held in May – July 2019, and during a 45-day written public comment period. Written comments may be sent by any of the following methods:

1. **Online** at www.mafmc.org/comments/scoq-excessive-shares-amendment
2. **Email** to the following address: **[TBD email address]**
3. **Mail or Fax** to:

Chris Moore, Ph.D., Executive Director
Mid-Atlantic Fishery Management Council
North State Street, Suite 201
Dover, DE 19901
FAX: 302.674.5399

If sending comments through the mail, please write "SCOQ Excessive Shares Amendment Comments" on the outside of the envelope. If sending comments through email or fax, please write "SCOQ Excessive Shares Amendment Comments" in the subject line.

All comments, regardless of submission method, will be compiled for review and consideration by the Council. **Please do not submit the same comments through multiple channels.**

Interested members of the public are encouraged to attend any of the following 4 public hearings and to provide oral or written comments at these hearings:

Date and Time	Location (Tentative)
[TBD]	**Hilton Garden Inn Providence Airport** 1 Thurber Street, Warwick, RI 02886. Telephone: (401) 734-9600.
[TBD]	**Webinar** This meeting will be conducted via webinar accessible via the internet from the Council's website, http://www.mafmc.org. Members of the public may also attend in-person at the Council office address (see below) for this webinar meeting, if they contact the Council by July 7, 2017.
[TBD]	**The Grand Hotel** 1045 Beach Avenue, Cape May, NJ 08204. Telephone: (609) 884-5611.
[TBD]	**Ocean Pines Branch Library** 11107 Cathell Road, Berlin, MD 21811. Telephone: (410) 208-4014.

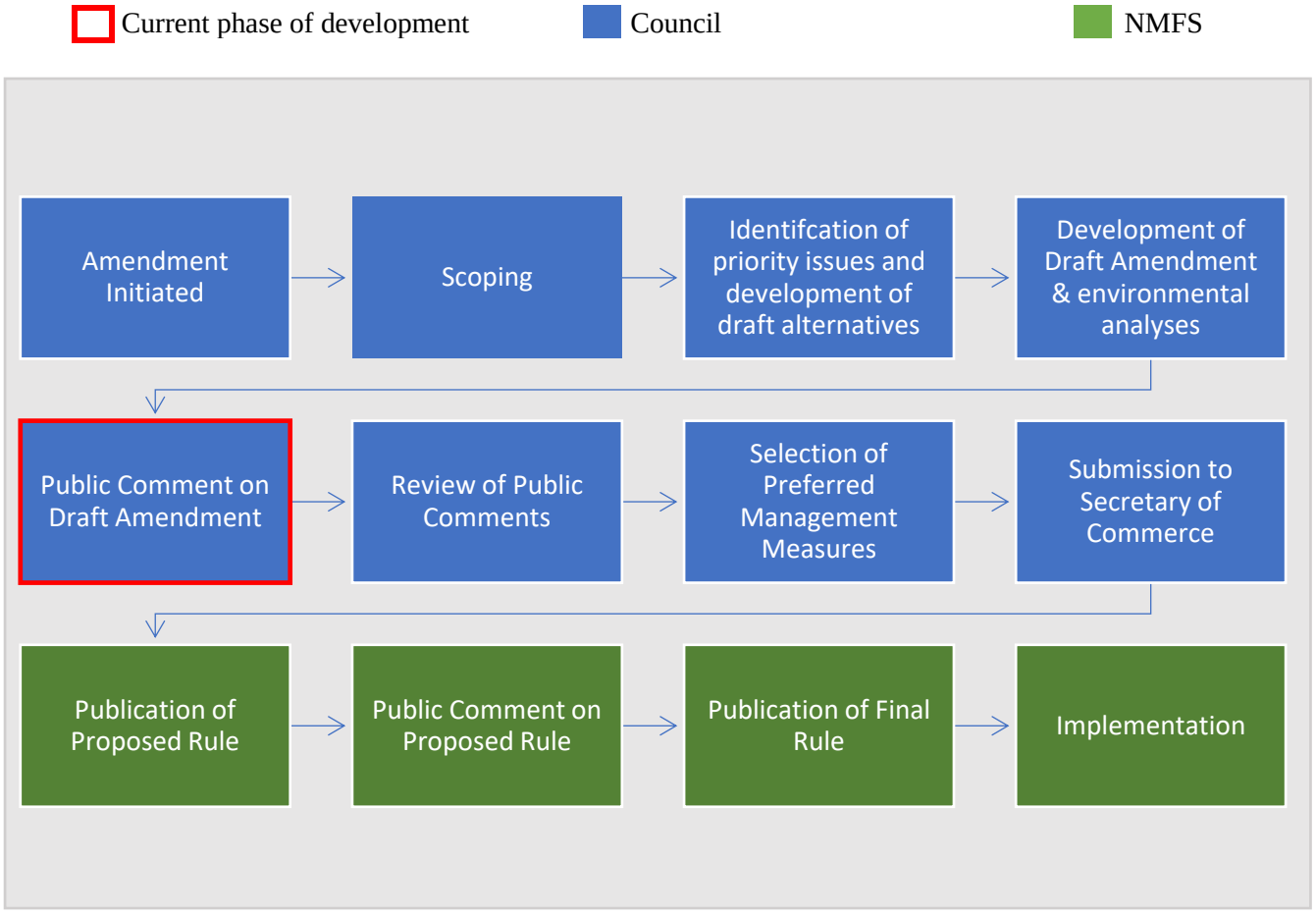
For additional information and updates, please visit: http://www.mafmc.org/actions/scoq-excessive-shares-amendment. If you have any questions, please contact either:

José Montañez, Ph.D., Fishery Management Specialist
Mid-Atlantic Fishery Management Council
302.526.5258

WHAT HAPPENS NEXT?

This document supports a series of public hearings and a public comment period scheduled to take place during May – July 2019. Following public hearings, written and oral comments will be compiled and provided to the Council and Board for review. These comments will be considered prior to taking final action on the amendment, which is tentatively scheduled for August 2019. The Council's recommendations are not final until they are approved or partially approved by the

Secretary of Commerce through the National Marine Fisheries Service, so the timing of full implementation of this action will depend on the federal rulemaking timeline. This rulemaking process is expected to occur in 2020, with revised measures possibly effective during the 2020 fishing year.



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

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

DRAFT AS OF 03/05/2019

Mid-Atlantic Fishery Management Council

in cooperation with

the National Marine Fisheries Service (NMFS)

Draft adopted by MAFMC: MM-DD-YYYY
Final adopted by MAFMC: MM-DD-YYYY
Draft submitted to NOAA: MM-DD-YYYY
Final approved by NOAA: MM-DD-YYYY

Council Address	**NMFS Address**
Mid-Atlantic Fishery Management Council	**Greater Atlantic Regional Fisheries Office**
800 North State Street, Suite 201	**55 Great Republic Drive**
Dover, DE 19901	**Gloucester, MA 01930**

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 Administrations (NOAA) National Marine Fisheries Service (NMFS). This document was developed in accordance with all applicable laws and statutes described in section 8.0.

The purpose of this action (amendment)[1] is to consider a variety of approaches to ensure that no individual, corporation, or other entity acquires an excessive share of the Atlantic surfclam and ocean quahog individual transferrable quota (ITQ) privileges. In addition, this amendment may also consider revisions to some or all of the current management objectives for the Atlantic Surfclam and Ocean Quahog Fishery Management Plan (FMP). Lastly, this action includes measures to revise the process for specifying multi-year management measures, require periodic review of the excessive share cap level, and allow adjustments to be made under the frameworkable provisions of the FMP.

1.1 Summary of Alternatives

This document details all evaluated management alternatives 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] Amendment number to be added after final action.

Box ES-1. Summary of the excessive shares alternatives. ***The Council needs to choose a specific model and affiliation level to select and/or monitor any particular excessive shares cap level they wish to implement.***

Alternatives	Summary of Alternative
Alternative 1: (No Action/*Status Quo*)	No limit or definition of an excessive share is included in the FMP.
Alternative 2: Single Cap – Quota share ownership-only with unlimited leasing of annual allocation (cage tags)	A single cap on how much quota share one individual or entity could hold would be established separately for surfclams and ocean quahogs. The cap would be based on quota share ownership[2] with unlimited leasing of annual allocation (cage tags) throughout the 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 business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit.
Sub-Alternative 2.1: Quota share 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 (i.e., surfclams and ocean quahogs) for the 2016-2017 period. The species-specific cap levels do not have to be the same for each species.
Sub-Alternative 2.2: Quota share cap at 49%	The single cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. A 49% cap could potentially result in a minimum (if fully consolidated) of three entities participating in the fisheries (i.e., two large entities and one small entity at 49%, 49%, and 2%).
Sub-Alternative 2.3: Quota share cap at 95%	The single cap would be 95% for surfclams and 95% for ocean quahogs. This sub-alternative is based on the recommendations made by some industry representatives. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly). 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%).
Alternative 3: Combined Cap – Combined quota share ownership plus leasing of annual allocation (cage tags)	A cap based on combined values for quota share ownership plus leasing of annual allocation (cage tags) would be established separately for surfclams and ocean quahogs. Since the cap is based on ownership plus leasing of annual allocation (cage tags), it accounts for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit.
Sub-Alternative 3.1: Combined cap based on highest level in the ownership data, 2016-2017	The combined caps would be based on the highest level of quota share ownership plus leasing of annual allocation (cage tags) by an individual or entity reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) for the 2016-2017 period. The species-specific cap levels do not have to be the same for each species.
Sub-Alternative 3.2: Combined cap at 40%	The combined cap would be 40% for surfclams and 40% for ocean quahogs. This is based on recommendations provided in the Compass Lexecon Report and corresponding CIE (Center for Independent Experts) review. A 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%).
Sub-Alternative 3.3: Combined cap at 49%	The combined cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value for a tilefish combined cap (i.e., ownership plus leasing). A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity at 49%, 49%, and 2%).

[2] **Quota Share Ownership** means 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 (e.g., 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 alternatives.

Alternatives	Summary of Alternative
Alternative 4: Two-Part Cap Approach – A cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags)	A two-part cap approach would be implemented for each surfclams and ocean quahogs, with a cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (tags). This is based on recommendations for a two-part cap provided in the Compass Lexecon Report.
***Sub-Alternative 4.1*:** Two-part cap based on highest level in the ownership data, 2016-2017	The two-part cap approach (one cap on allocation ownership and one cap on combined [allocation ownership plus leasing of annual allocation or cage tags]) would be based on the highest levels reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) the 2016-2017 period. The species-specific cap levels do not have to be the same for each species.
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	The two-part cap approach would be based on values reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) the 2016-2017 period (as done under sub-alternative 4.1). However, under this sub-alternative, a 15% for additional consolidation is added to the maximum values reported in the ownership data for the 2016-2017 period. The 15% value for additional consolidation was recommended by some industry representatives and is expected to provide flexibility for efficient firms in the surfclam and ocean quahog fisheries to consolidate/growth if market conditions allow.
Sub-Alternative 4.3: Ownership quota share cap at 30% and combined cap at 60%	The two-part cap with an ownership quota share cap at 30% and the combined cap (quota share ownership plus leasing of annual allocation or cage tags) at 60%. These values are based on recommendations for a two-part cap provided in the Compass Lexecon Report.
Alternative 5: Cap based on a 40% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota	The cap would be 40% for surfclams and 40% for ocean quahogs with unlimited leasing of annual allocation (cage tags) 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. A 40% cap could potentially result in a minimum of three large entities participating in the fisheries (i.e., 40%, 40%, and 20%).
Alternative 6: Cap based on a 49% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota	The cap would be 49% for surfclams and 49% for ocean quahogs with unlimited leasing of annual allocation (cage tags) 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. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity at 49%, 49%, and 2%).

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

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

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

Alternatives	Summary of Alternative
Alternative 1: (No Action/*Status Quo*)	No changes to the list of management measures that can be addressed via the framework adjustment process.
Alternative 2: Add modification of the excessive share cap levels to the list of measures to be adjusted via framework	This alternative would allow for the expansion 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 share cap level. This frameworkable item would provide means to make modifications to the 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 select 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 Alternative
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: Allow for specifications to be set for a maximum number of years consistent with the NRCC-approved stock assessment schedule	Specifications could be set for a period up to the maximum number of years consistent with the Northeast Regional Coordinating Council (NRCC)-approved stock assessment schedule. This alternative would provide additional flexibility as specifications could be set to cover the time period until a new surflclam and/or ocean quahog assessment is produced.

1.2 Summary of Impacts

The following section presents a summary of the expected impacts (qualitative and/or quantitative) by alternative and cumulative for all evaluated alternatives (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 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 current condition of the value ecosystem component (VEC) and also compared to each other. The recent conditions of the VECs include the biological condition of the target stock, 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 (see especially Table 16).

The actions proposed through this amendment are largely administrative in nature and are not expected to have any impact on fishing methods and practices and are not expected to result in changes in fishing effort or redistribution in fishing effort. 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. Anticipated impacts are described below.

1.2.1 Excessive Share Alternatives

Impacts to Surfclams and Ocean Quahogs and Non-Target Species, Physical Habitat, and Protected Resources

Under alternative 1 (no action), no limit 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 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 Atlantic 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, they are not expected to impact the target species compared to current conditions. Similarly, since fishing effort is not expected to change under any of the alternatives, it is not expected that there would be any impacts compared to recent conditions. 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.

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 landings or 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 NS4 of the MSA. The FMP would rely only on federal anti-trust provisions. The Department of Justice has indicated that their Business Practice Process does provide a 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. Therefore, 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 would be a level of quota control that results 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. 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 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 with unlimited leasing of annual allocation (cage tags). Because alternative 2 is based on ownership-only values, none of the sub-alternatives discussed below account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit.

Note: 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 select and/or monitor any particular excessive shares cap level they wish to implement.[3]

Under Sub-alternative 2.1, the single quota would be based on the highest level of quota share held by any individual or entity reported in the ownership data for each fishery for the 2016-2017 period. The highest level of quota share held by any individual or entity during the 2016-2017 period was 28% for surfclams and 22% for ocean quahogs (regardless of model or affiliation level; Tables 2 and 3). A 28% cap for surfclams could potentially result in a minimum (if fully consolidated) of four large entities participating in this fishery (i.e., four large entities at 28%, 28%, 28%, and 16%). A 22% cap for ocean quahogs could potentially result in a minimum of five large entities participating in this fishery (i.e., five large entities at 22%, 22%, 22%, 22%, and

[3] See Definitions and Terminology at the end of Section 2.0 for more information on these choices. More detailed information on these choices is found in sections 5.0 and 7.0.

12%). This implies at least four entities in the surfclam and five entities in the ocean quahog fisheries, which may provide some protection against excessive share consolidation and associated market power issues.

If the surfclam and ocean quahog cap levels described above (28% and 22%, respectively) had been implemented in 2017, all entities would have fallen at or below those quota share caps regardless of ownership percentage model (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 share consolidation and associated market power issues.

Under Sub-alternative 2.2, the single cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 share consolidation and associated market power issues.

Under Sub-alternative 2.3, the single cap would be 95% for surfclams and 95% for ocean quahogs. This sub-alternative is based on the recommendations made by some industry representatives. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly).

It is stated in the Compass Lexecon Report it is possible that under some circumstances an excessive share cap 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). Lastly, 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 where 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. 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. 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 for surfclam and/or ocean quahogs).

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. 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.

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 the least positive impacts.

Alternative 3

Alternative 3 considers a combined cap – combined quota share ownership plus leasing of annual allocation (cage tags). Because alternative 3 is based on combined ownership plus leasing of annual allocation (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 business practices 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 combined cap held by any individual or entity reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) for the 2016-2017 period. Under sub-alternative 3.1, depending on the affiliate level and model selected, the combined 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 combined cap values, sub-alternative 3.1 could result in a minimum number of large entities 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 combined cap for ocean quahogs 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 quahogs, this sub-alternative could result in a minimum number of large entities ranging from four under the net actual percentage model to three under the cumulative 100% model (Table 19).

If the surfclam and ocean quahog combined cap levels described above had been implemented in 2017, all entities would have fallen below those combined caps regardless of ownership percentage model (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; Table 19). As such, no entity would have been constrained by the combined 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 share consolidation and associated market power issues.

Under Sub-alternative 3.2, the combined cap would be 40% for surfclams and 40% for ocean quahogs. This is based on recommendations provided in the Compass Lexecon Report and corresponding CIE review (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 [ensure] that there would be at least three processors operating at reasonable output levels” (Walden 2011). A 40% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., three large entities at 40%, 40%, and 20%; Table 19).

If the surfclam and ocean quahog combined cap levels described above (40% for surfclam and 40% for ocean quahog) had been implemented in 2017, all entities would have fallen below those combined caps under the net actual percentage model for both surfclams and ocean quahogs. 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 had combined cap above these levels depending on the affiliation level (Table 19).

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 share consolidation and associated market power issues.

Under Sub-alternative 3.3, the combined cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value for a tilefish combined cap (i.e., ownership plus leasing). A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity, at 49%, 49%, and 2%; Table 19).

If the surfclam and ocean quahog combined 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 (Table 19).

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 share consolidation and associated market power 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 where compared to current conditions.

Sub-alternative 3.1 would have no socioeconomic impacts in the short-term compared to sub-alternatives 3.2 and 3.3. In the long-term, alternative 3.1 would have no 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 of 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. 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.

Sub-alternative 3.2 would have slight positive socioeconomic impacts in the long-term compared to sub-alternatives 3.3, as sub-alternative 3.2 has the potential to provide a larger degree of protection against excessive consolidation.

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.

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 a cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags). 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 combined quota share ownership plus leasing, 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 leasing of annual allocation (cage tags), it accounts for transactions and complex business practices that occur in this fisheries.

Under Sub-alternative 4.1, the two-part cap approach which includes one cap on allocation ownership and one combined cap (allocation ownership plus leasing of annual allocation or cage tags) would be based on the highest levels reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) 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% ownership / 28% combined under the net actual percentage model (at the individual/business level) or as high as 28% ownership / 49% combined under the cumulative 100% model (at the corporate officer level; Tables 2 and 20). Based on these combined cap values, sub-alternative 4.1 could result in a minimum number of five large entities 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 quahogs could be as low as 22% ownership / 29% combined under the net actual percentage model (at the individual/business level) or as high as 22% ownership / 41% combined under the cumulative 100% model (at the corporate officer level; Tables 3 and 20). For ocean quahogs, this sub-alternative could result in a minimum number of five large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 share consolidation and associated market power issues. In addition,

since this 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

Under Sub-alternative 4.2, the two-part cap approach would be based on values reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) 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 data for the 2016-2017 period to allow for additional consolidation (Table 20). The 15% value to allow for additional consolidation 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% ownership / 43% combined under the net actual percentage model (at the individual/business level) or as high as 43% ownership / 64% combined under the cumulative 100% model (at the corporate officer level; Table 20). Based on these combined cap values, sub-alternative 4.1 could result in a minimum number of five large entities 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 quahogs could be as low as 37% ownership / 44% combined under the net actual percentage model (at the individual/business level) or as high as 37% ownership / 56% combined under the cumulative 100% model (at the corporate officer level; Table 20). For ocean quahogs, this sub-alternative could result in a minimum number of five large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 4.2 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 share consolidation and associated market power issues. In addition, since this 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.

Under Sub-alternative 4.3, the ownership quota share cap would be 30% and the combined cap (quota share ownership plus leasing of annual allocation or cage tags) would be 60%. These values are 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 multiseason basis." A 30% ownership cap and a 60% combined cap (quota share ownership plus leasing of annual allocation or cage tags) 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 (i.e., 30%/60%) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 (Table 20). 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 share consolidation and associated market power issues. In addition, since this 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.

Comparisons Across Sub-Alternatives 4.1 to 4.3

In this section a comparison between sub-alternatives 4.1 through 4.3 is made. This is different from the previous section where each of these sub-alternatives where compared to current conditions.

In general terms, sub-alternatives 4.1, 4.2, and 4.3 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 of four large entities) participating in these fisheries (Table 20). As such, they all have the potential to provide a relatively similar degree of protection against excessive consolidation.

Alternative 5

Alternative 5 considers a cap on quota share ownership-only of 40% for surfclams and 40% for ocean quahogs with unlimited leasing of annual allocation (cage tags). 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.

A 40% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., three large entities at 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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. 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. Lastly, while not likely, 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 surfclams or quahogs 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 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 share consolidation and associated market power issues.

Alternative 6

Alternative 6 considers a cap on quota share ownership-only of 49% for surfclams and 49% for ocean quahogs with unlimited leasing of annual allocation (cage tags). 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 IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. The only difference between alternatives 5 and 6 are the cap levels on quota share ownership, all other aspects of the alternatives are identical.

A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office). 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 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 share consolidation and associated market power issues.

Comparisons Across All Excessive Shares Alternatives

In general terms, alternatives 5 and 6 would result in the largest positive impacts, 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.

Alternative 1 (No Action)

As previously indicated, under alternative 1 (no action) no limit 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. 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).[4]

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 landings or ex-vessel revenues are expected when compared to current conditions. As previously indicated, the actions proposed through this amendment are largely administrative in nature and are not expected to have any impact on fishing methods and practices and are not expected to result in changes in fishing effort or redistribution in fishing effort. 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.

Alternative 2

Alternative 2 would implement a single cap based on quota share ownership-only with unlimited leasing of annual allocations (cage tags). Because alternative 2 is based on ownership-only values, it does not account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) 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 surfclams and ocean quahogs, 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 share 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, 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 surfclams and ocean quahogs 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.

Alternative 3

[4] 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).

Alternative 3 would implement a combined cap based on quota share ownership plus leasing of annual allocation (cage tags). Because alternative 3 is based on combined ownership plus leasing of annual allocation (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 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 share 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, 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 surfclams and ocean quahogs 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.

Alternative 4

Alternative 4 would implement a two-part cap approach, with a cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags). Because alternative 4 is based on a two-part cap approach that limits combined quota share ownership plus leasing, 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 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 share 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, 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 surfclams and ocean quahogs 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.

Alternative 5

Alternative 5 would implement a cap on quota share ownership-only with unlimited leasing of annual allocation (cage tags). 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 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 surfclams and ocean quahogs 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. 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 surfclams and ocean quahogs 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.

Alternative 6

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

1.2.2 Excessive Shares Review Alternatives

Impacts to Surfclams and Ocean Quahogs and Non-Target Species, Physical Habitat, and Protected Resources

Under alternative 1 (no action), there would not be a requirement for periodic review of any implemented excessive shares measures. Alternative 2, would implement a requirement for periodic review of any 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.

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 will likely change in the future. Therefore, an excessive shares measure established at an appropriate level 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 any implemented excessive shares measures (alternative 1) 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) 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 any 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 any excessive management shares management measure(s) implemented by the Council. While it is not possible to anticipate the potential management costs 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

Impacts to Surfclams and Ocean Quahogs and Non-Target Species, Physical Habitat, and Protected Resources

Under alternative 1 (no action), there would not be changes to the list of management measures that can be addressed via the framework adjustment process. Alternative 2 would allow for the expansion 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 share 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.

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. However, alternative 1 (no action) would not allow the excessive shares cap 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 typically requires more work and time compared to a framework process. Not having the flexibility to make minor modifications to the excessive share 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 share 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 potential modifications to any implemented excessive cap level if it becomes inefficiently or low through time as fisheries conditions change.

1.2.4 Multi-Year Management Measures Alternatives

Impacts to Surfclams and Ocean Quahogs 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. Alternative 2 would allow for specifications to be set for a maximum number of years consistent with the Northeast Regional Coordinating Council (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).

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 alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect.

Alternative	Target and Non-Target Species	Physical Environment/Habitat/EFH	ESA-Listed Protected Species (endangered or threatened)	Human Communities (Socioeconomic)
Alternative 1 (No-Action/*Status Quo*)	No Impact	No Impact	No Impact	No impact in the short-term to - in the long-term if consolidation patterns result in decreased competition
Alternative 2 Sub-alternative 2.1	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Cap based on ownership-only)
Alternative 2 Sub-alternative 2.2	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Cap based on ownership-only)
Alternative 2 Sub-alternative 2.3	No Impact	No Impact	No Impact	No impact in the short-term to - in the long-term if consolidation patterns result in decreased competition. (Cap based on ownership-only)
Alternative 3 Sub-alternative 3.1	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Limits the exercise of market power that could be derived through both quota ownership and contractual control of quota)
Alternative 3 Sub-alternative 3.2	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Limits the exercise of market power that could be derived through both quota ownership and contractual control of quota)
Alternative 3 Sub-alternative 3.3	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Limits the exercise of market power that could be derived through both quota ownership and contractual control of quota)

Box ES-5 (Continued). Summary of the expected impacts of excessive shares alternatives, relative to current conditions. – = negative; + = positive impact; slight = minor effect.

Alternative	Target and Non-Target Species	Physical Environment/Habitat/EFH	ESA-Listed Protected Species (endangered or threatened)	Human Communities (Socioeconomic)
Alternative 4 Sub-alternative 4.1	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues). Cap on ownership and combined cap (ownership + leasing)
Alternative 4 Sub-alternative 4.2	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues). Cap on ownership and combined cap (ownership + leasing)
Alternative 4 Sub-alternative 4.3	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues). Cap on ownership and combined cap (ownership + leasing)
Alternative 5	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Aligns supply in the fisheries with market demand)
Alternative 6	No Impact	No Impact	No Impact	No impact in the short-term to + in the long-term (provides protection against excessive share consolidation and associated market power issues. Aligns supply in the fisheries with market demand)

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	Physical Environment/ Habitat/EFH	ESA-Listed Protected Species (endangered or threatened)	Human Communities (Socioeconomic)
Alternative 1 (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-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	Physical Environment/ Habitat/EFH	ESA-Listed Protected Species (endangered or threatened)	Human Communities (Socioeconomic)
Alternative 1 (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	Physical Environment/ Habitat/EFH	ESA-Listed Protected Species (endangered or threatened)	Human Communities (Socioeconomic)
Alternative 1 (No-Action/*Status Quo*)	No Impact	No Impact	No Impact	No Impact
Alternative 2	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
bu	Bushels
CEA	Cumulative Effects Assessment
COE	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
FONSI	Finding of No Significant Impact
GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GOM	Gulf of Maine
HMA	Habitat Management Areas
IBQ	Individual Bluefin Quota
IFQ	Individual Fishing Quota
ITQ	Individual Transferrable Quota
k	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)
MFP	Multi-factor Productivity
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
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 = 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 Atlantic 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 quahogs), the initial allocation for the next fishing year is calculated by multiplying the quota share percentage held by each ITQ permit 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 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 corporate ownership and other forms of control of allocations. This information would allow managers to better characterize the 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 Share: An amount (level of quota) of the Atlantic surfclam and ocean quahog Individual Transferrable Quota (ITQ) privileges that could result in market power for a firm or entity. From a social perspective, concentration of ownership and control in the form of an excessive share affects the social and community structure and the sense of equity that may, in part, be grounded in the history of fishery management. 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.

ITQ: A from of output control in which harvesting privileges are allocated to individual fishermen.

ITQ Quota Share: Percent of the total quota held by each ITQ permit holder.

National Standards (NS): The National Standards are principles that must be followed in any fishery management plan to ensure sustainable and responsible fishery management. As mandated by the Magnuson-Stevens Fishery Conservation and Management Act, NOAA Fisheries 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 Standard guidelines. 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.

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

Quota Share Ownership: means 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 (e.g., 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).

Transferability Rules: allow ITQ allocation holders to buy, sell, give away (permanent transfer of ITQ quota share) or lease their privileges (temporary transfer of 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 (used 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 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 ownership (or share totals for ownership quota share) and combined level (ownership plus leasing of cage tags):

Owner Percentage Models (*Models for determination of quota ownership (or share totals for ownership quota share) and combined level (ownership plus leasing of cage tags)*:

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 **(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.greateratlantic.fisheries.noaa.gov/aps/forms.html).

3.0 TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

4.0 INTRODUCTION AND BACKGROUND

This document was developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA)[5] and National Environmental Policy Act (NEPA), the former being the primary domestic legislation governing fisheries management in the U.S. Exclusive Economic Zone (EEZ), and the Atlantic Surfclam and Ocean Quahog Fishery Management Plan (FMP). The management regime and objectives of the fisheries are detailed in the FMP, including any subsequent amendments 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 in 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.[6]

In addition, 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 a process to consider revised goals and objectives for the FMP 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 possibly "refresh" FMP goals and objectives to ensure that they are consistent with today's fisheries and management issues. The issue is included in the Excessive Shares Amendment to take advantage of efficiencies in timing and public review.

[5] 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

[6] 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 corporate ownership and other forms of control of allocations. This information would allow managers to better characterize the 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.

Lastly, 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 consistent with the approved Northeast Regional Coordinating Council (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 cap share level to be made and allow adjustments to the frameworkable provisions in the FMP.

Current Catch Shares Fisheries Programs in the USA

There are currently 16 limited catch shares programs in the country. 13 of these programs have specific excessive shares cap limits. Two other programs do not specify an excessive shares cap limit, but they have other measures in place to avoid excessive accumulation of share 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.[7] See Appendix A for additional information for catch shares programs in the USA.

The Council's Surfclam and Ocean Quahog Fishery Management Action Team (FMAT) met on May 14, 2018, to draft alternatives that would address excessive shares in the surfclam and ocean quahog ITQ fisheries. The FMAT discussed what constitutes an 'excessive share' and noted that the national standards of the MSA apply to all the actions the Council considers, including excessive shares. Therefore, excessive shares should be defined in a manner consistent with the MSA, which has many standards to consider, and including both social and economic. Considering economics, an excessive share would be a level of quota control that results 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 simple terms, the market for quota share is less competitive than desired. Other catch shares programs have also considered other aspects of the MSA. From a social perspective, concentration of ownership and control in the form of an excessive share affects the social and community structure and the sense of equity that may, in part, be grounded in the history of fishery management.

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 proposed modification of objectives. The current FMP objectives are as follows:

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

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

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 the clam's 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 a process to consider revised goals and objectives for the Atlantic Surfclam and Ocean Quahog FMP in support of the 2014-2018 Strategic Plan and 2017 Implementation Plan. This initiative allows the Council to revisit and possibly "refresh" FMP goals and objectives to ensure that they are consistent with today's fisheries and management issues. The consideration of revising the FMP goals and objectives is separate from the Council's consideration of excessive share measures. This issue is included in the Excessive Shares Amendment to take advantage of efficiencies in timing and other resources.

Feedback and industry input on the FMP goals and objectives were gathered in a two-stage process. First, when the Council conducted scoping hearings to solicit public input on the development of the Excessive Shares Amendment, feedback on FMP goals and objectives was also gathered. Second, the Council contracted with the Fisheries Leadership & Sustainability Forum (Fisheries Forum) to develop a process to support the Council's review of FMP goals and objectives. The Fisheries Forum collected feedback from the Council's Surfclam and Ocean Quahog Committee, the Council's Surfclam and Ocean Quahog Advisory Panel, and state agency representatives from

states engaged in the fisheries that were not represented on the Committee (Maine and Massachusetts). The Fisheries Forum synthetized all feedback gathered to identify major ideas and themes of discussion. The Council's Surfclam and Ocean Quahog FMAT reviewed this information and developed recommendations for new FMP goals and objectives. The Council reviewed the FMAT recommendations at the October 2017 Council meeting. The Council approved the FMAT recommendations for inclusion in the public hearing document for the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment. These recommendations are listed below. For additional details on the rationale for these recommendations see Appendix B.

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.

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.

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 surfclams and ocean quahogs are summarized in Table 1. These actions are available on the Council's website 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 surfclams - Established annual quotas for ocean quahogs - 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
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

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

Year Approved	Document	Management Action(s)
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 individual transferable quota (ITQ) system
1996	Amendment 9	- Revised the overfishing definitions for surfclams and ocean quahogs in response to a scientific review by NMFS
1998	Amendment 10	- Provided management measures for the small artisanal fishery for ocean quahogs (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 individual transferable quota (ITQ) fishery, 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

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 Atlantic surfclam and ocean quahog ITQ privileges. This amendment also considers requirements for the periodic review of any implemented excessive 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 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 here: http://www.greateratlantic.fisheries.noaa.gov/regs/fr.html.

5.1 Excessive Share Alternatives

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

At this point it is unclear, if any of the alternatives under consideration will result in the need for any individual, entity, or corporation to divest. Therefore, there are no alternatives in this document that describes specific divestment mechanisms in the event that an individual or entity has accumulated quota share ownership in excess of the quota ownership levels presented in the alternatives described below. However, the Council, can consider divestment mechanisms if they find this necessary, or they can leave it to NMFS to address divestment options and mechanism.

The Compass Lexecon Report and associated Center for Independent Experts (CIE) review indicated a need for reliable information regarding ownership and control of quota in the surfclam and ocean quahog fisheries. Information showing detailed quota transfers and ownership relationships among final quota holders is important in assessing ownership and control (Mitchell et al., 2011, Walden 2011).

Participants in the surfclam and ocean quahog fisheries report that there are various types of transactions involving ITQs that commonly occur, including permanent quota share transfers, long-term bushel tag leases (e.g., five years), and transfers of cage tags (Mitchell et al. 2011). 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 ownership and control of the quota following transfers in the surfclam and ocean quahog fisheries. However, some industry members have reported that they would not disclose specific details on long-term ITQ leases,[8] as they see it as a confidential business practice. The ownership data collected for 2016 and 2017 includes very limited information on 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 "the power to decide whether the quota will be used to harvest clams," in this analysis combined "control" is used in the context of the possession of the cage tags, which is the power to decide if they will be used to harvest clams.[9]

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 NS4 of the MSA. The FMP would rely only on federal anti-trust provisions.

5.1.2 Alternative 2: Single Cap – Quota share ownership-only with unlimited leasing of annual allocation (cage tags)

Under alternative 2, a single quota share cap on how much quota share one individual or entity could hold would be established separately for surfclams and ocean quahogs. The cap would be based on quota share ownership with unlimited leasing of annual allocation (cage tags)[10] throughout the year.[11] Since the cap under this alternative is based on ownership-only, it does not

[8] Long-term contracts.
[9] In the scallop fishery, a similar concept is used to tabulate quota accumulation levels, that is, "if you touch it" (hold the tags), you have the ability to make decisions about whether those tags are fished or not.
[10] There would be no limit of how much annual allocation (cage tags) an individual or entity could use or transfer during the fishing year.
[11] All excessive share alternatives are applicable throughout the year.

account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without Government oversight.

Note: 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 select and/or monitor any particular excessive shares cap level they wish to implement.[12]

5.1.2.1 Sub-Alternative 2.1: Quota share 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[13] for each fishery (i.e., surfclams and ocean quahogs) for the 2016-2017 period,[14] as described below. The species-specific cap levels do not have to be the same for surfclam and ocean quahogs. Specific maximum values for various models and level of analysis (e.g., affiliate levels) are presented in Tables 2 and 3. Note that the values in Tables 2 and 3 were rounded up to easy quantifying and monitoring process (e.g., 27.3 was rounded up to 28 and 27.7 was also rounded up to 28). These values were rounded up because rounding down could result in an existing entity being over the cap merely because of the rounding approach. The caps based on ownership data from 2016 to 2017 would be:

For surfclams –

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

For ocean quahogs –

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

A 28% cap for surfclams could potentially result in a minimum (if fully consolidated) of four large entities participating in the fisheries (i.e., four large entities at 28%, 28%, 28%, and 16%). A 22% cap for ocean quahogs could potentially result in a minimum of five large entities participating in the fisheries (i.e., five large entities at 22%, 22%, 22%, 22%, and 12%).[15] The Council needs to

[12] See Definitions and Terminology at the end of Section 2.0 for more information on these choices. More detailed information on these choices is found in section 7.0.

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

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

[15] The resulting number of minimum entities under excessive shares 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 be driven out of business.

choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

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

Under sub-alternative 2.2, the single cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity at 49%, 49%, and 2%). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

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

Under sub-alternative 2.3, the single cap would be 95% for surfclams and 95% for ocean quahogs. This sub-alternative is based on the recommendations made by some industry representatives. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly). 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%). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

Table 2. Surfclam maximum quota share ownership and combined level (quota share ownership plus leasing of annual allocation or cage tags) at the individual/business level, family level, and corporate officer level for various data tabulation models, 2016-2017.

Surfclam Values							
Owner 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	28	28	28	28	28	28
	Combined (Ownership + Leasing)	28	28	33	33	44	43
Cumulative 100% Model	Owned	28	28	28	28	28	28
	Combined (Ownership + Leasing)	48	46	49	47	49	47

Terminology

1) 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.

2) 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 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 combined level (quota share ownership plus leasing of annual allocation or cage tags) at the individual/business level, family level, and corporate officer level for various data tabulation models, 2016-2017.

Ocean Quahog Values							
Owner 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	22	22	22	22	22	22
	Combined (Ownership + Leasing)	29	25	29	28	37	39
Cumulative 100% Model	Owned	22	22	22	22	22	22
	Combined (Ownership + Leasing)	38	41	38	41	38	41

Terminology

1) 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.

2) 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 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: Combined Cap – Combined quota share ownership plus leasing of annual allocation (cage tags)

Under alternative 3, a cap based on combined values for quota share ownership plus leasing of annual allocation (cage tags) would be established separately for surfclams and ocean quahogs. Since the cap under this alternative is based on ownership plus leasing of annual allocation (cage tags), it accounts for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing)[16] that are prevalent in the fisheries when setting the cap limit.

5.1.3.1 Sub-Alternative 3.1: Combined cap based on highest level in the ownership data, 2016-2017

Under sub-alternative 3.1, the combined caps would be based on the highest level of quota share ownership plus leasing of annual allocation (cage tags) by an individual or entity reported in the ownership data[17] for each fishery (i.e., surfclams and ocean quahogs) for the 2016-2017 period, as described below. The species-specific cap levels do not have to be the same for surfclam and ocean quahogs. The combined caps under this alternative would depend on the determination of combined levels (quota share ownership plus cage tag leasing) 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 (e.g., affiliate levels) are presented in Tables 2 and 3. The combined caps based on ownership data from 2016 to 2017 would be:

For surfclams -

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

For ocean quahogs -

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

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

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

    - 41% under the combined cumulative 100% model
- Option C: At the corporate officer level, the cap would be:
    - 39% under the combined net actual percentage model
    - 41% under the combined 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 select and monitor a specific cap under this alternative. The resulting number of minimum entities under each scenario are presented in section 7.0.

5.1.3.2 Sub-Alternative 3.2: Combined cap at 40%

Under sub-alternative 3.2, the combined cap would be 40% for surfclams and 40% for ocean quahogs. This is based on recommendations provided in the Compass Lexecon Report and corresponding CIE review (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 [ensure] that there would be at least three processors operating at reasonable output levels" (Walden 2011). A 40% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., three large entities at 40%, 40%, and 20%). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

5.1.3.3 Sub-Alternative 3.3: Combined cap at 49%

Under sub-alternative 3.3, the combined cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value for a tilefish combined cap (i.e., ownership plus leasing). A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity at 49%, 49%, and 2%). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

5.1.4 Alternative 4: Two-Part Cap Approach – A cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags)

Under alternative 4, a two-part cap approach would be implemented for each surfclams and ocean quahogs, with a cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags). 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 combined quota share ownership plus leasing, it would limit the exercise of market power that could be derived through both quota ownership and contractual control of quota.

Since this alternative limits the leasing of annual allocation (cage tags), it accounts for transactions and complex business practices that occur in these fisheries**.**

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

Under sub-alternative 4.1, the two-part cap approach which includes one cap on allocation ownership and one combined cap (allocation ownership plus leasing of annual allocation or cage tags) would be based on the highest levels reported in the ownership data[18] for each fishery (i.e., surfclams and ocean quahogs) the 2016-2017 period, as described below. The species-specific cap levels do not have to be the same for surfclam and ocean quahogs. 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). Specific maximum values for various models and level of analysis (e.g., affiliate levels) are presented in Tables 2 and 3. The two-part cap based on ownership data from 2016 to 2017 would be:

For surfclams -

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

For ocean quahogs -

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

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

percentage model) to select 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 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 data[19] for each fishery (i.e., surfclams and ocean quahogs) 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 data for the 2016-2017 period to allow for additional consolidation (Tables 2 and 3). The 15% value to allow for additional consolidation 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 do not have to be the same for surfclam and ocean quahogs. 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). Specific maximum values for various models and level of analysis (e.g., affiliate levels) are presented in Tables 2 and 3. The two-part cap based on ownership 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 surfclams -

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

For ocean quahogs -

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

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

- 37% ownership / 56% combined 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 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 select and monitor a specific cap under this alternative. The resulting number of minimum entities under each scenario are presented in section 7.0.

5.1.4.3 Sub-Alternative 4.3: Ownership quota share cap at 30% and combined cap at 60%

Sub-Alternative 4.3, the ownership quota share cap would be 30% and the combined cap (quota share ownership plus leasing of annual allocation or cage tags) would be 60%. These values are 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 multiseason basis." This alternative could potentially result in a minimum of four entities participating in the fisheries (i.e., four large entities at 30%, 30%, 30%, and 10% ownership quota share cap). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

5.1.5 Alternative 5: Cap based on a 40% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota

Under alternative 5, the cap would be 40% for surfclams and 40% for ocean quahogs with unlimited leasing of annual allocation (cage tags), 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.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without Government oversight.

The 40% cap under this alternative is based on recommendations found in the Compass Lexecon Report and corresponding CIE review (Mitchell et al. 2011, 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 Quota A and Quota B shares is that it allows additional flexibility for increasing harvests if there is a surge in demand for surfclams or quahogs midway through the fishing year. Lastly, this alternative could potentially result in a minimum of three

large entities participating in the fisheries (i.e., 40%, 40%, and 20%). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

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 surfclams and ocean quahogs. In this example, the same overall quota levels that have been in place for surfclams and ocean quahogs for the 15 years are used in year 4. In addition, under this example a 3-year average (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 it can be seen 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 surfclams and 166,656 cage tags for ocean quahogs) 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 exhausted.[20] As an example, for surfclams, 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 surfclams and ocean quahogs under alternatives 5 and 6.

Year	Quota Million bushels	Landings Million bushels	Quota A shares Million bushels	Quota B shares Million bushels
Atlantic surfclams				
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 quahogs				
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

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

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: Cap based on a 49% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota

Under alternative 6, the cap would be 49% for surfclams and 49% for ocean quahogs with unlimited leasing of annual allocation (cage tags) 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. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without Government 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 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 Quota A and Quota B shares is that it allows additional flexibility for increasing harvests if there is a surge in demand for surfclams or quahogs midway through the fishing year. Lastly, this alternative could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity at 49%, 49%, and 2%). The Council needs to choose which affiliate level (individual/business level, family level, or corporate officer level (e.g., chief executive officer or CEO)) and model (cumulative 100% model or net actual percentage model) will be used to monitor and enforce this cap.

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

5.2 Excessive Shares Review Alternatives

5.2.1 Alternative 1: No Action/*Status Quo*

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

5.2.2 Alternative 2: 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 any excessive shares measures that the Council adopts would permit the Council to revise these measures if conditions in the fisheries change over time. Conditions in the fisheries have changed over time since the FMP was implemented and the ITQ system became effective, and those conditions will likely change in the future. Therefore, an excessive shares measure or specific cap level established at an appropriate level 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 cap levels 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 for an enforceable provision for regular review and evaluation of the performance of the cap for the surfclam and ocean quahog ITQ fisheries. However, under this alternative, does not preclude the Council could review 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 within the scope and criteria established by the FMP within a range as defined and analyzed in the FMP. The Amendment 12 to the Surfclam and Ocean Quahog FMP implemented a framework adjustment process that allows management measures to be added or modified through a streamline public process (MAFMC 1998b). The range of frameworkable management measure 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. It may be useful to add the cap review measure as frameworkable under the FMP in order to address potential future changes in the ITQ program in a timely fashion.

5.3.1 Alternative 1: No Action/*Status Quo*

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

5.3.2 Alternative 2: Add modification of the excessive share cap levels to the list of measures to be adjusted via framework

This alternative would allow for the expansion 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 share cap level.

This frameworkable item would provide means to make modifications to the 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 select cap or model or affiliation level used to select cap), only if the modification would not result in an entity having to divest. The inclusion of this measure to the list of measures that can be addressed via the framework adjustment process 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 the annual specification process. Additionally, longer term specifications should provide greater regulatory consistency and predictability to the fishing sectors.

5.4.1 Alternative 1: No Action/*Status Quo*

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. Specifications of the 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 acceptable biological catch (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.

5.4.2 Alternative 2: Allow for specifications to be set for a maximum number of years consistent with the NRCC-approved stock assessment schedule

Under alternative 2, specifications could be set for a period up to the maximum number of years consistent with the NRCC-approved stock assessment schedule.[21] 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 the annual quotas would be prepared in the final year of the quota period, unless there is a need for interim quota modifications. 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 and/or 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 to provide to the SSC and the Council.

Lastly, under the current regulations at §648.72, there is some terminology 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 off 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 Atlantic surfclam and ocean quahog ITQ privileges corresponding to the purpose and need statements described in section 4.1. To address these need 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 (5.5.2 and 5.5.3).

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

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 (see 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 for further analysis as it was deemed unpractical 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 will likely change in the future. Therefore, an excessive shares measure or specific cap level established at an appropriate level 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, making this approach unpractical.

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

The seven steps on excessive shares proposal presented in the Compass Lexecon Report includes the use of the Herfindahl-Hirschman Index (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 readily available and would also require frequent revision of caps due to changes in market dynamics, making this approach unpractical.

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. Atlantic 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

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 Amendment 13 to the FMP (MAFMC 2003). 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).

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 Atlantic 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: http://www.nefsc.noaa.gov/nefsc/habitat/efh. 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 surfclams are distributed along the western North Atlantic Ocean from the southern Gulf of St. Lawrence to Cape Hatteras. Surfclams 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, surfclams 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 surfclams is about 22.5 cm (8.9 inches) shell length, but surfclams larger than 20 cm (7.9 inches) are rare. The maximum age exceeds 30 years and surfclams of 15-20 years of age are common in many areas. Surfclams 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 surfclams are suspension feeders on phytoplankton and use siphons which are extended above the surface of the substrate to pump in water. Predators of surfclams 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: http://www.nefsc.noaa.gov/nefsc/habitat/efh. 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, quahogs occur from Newfoundland to Cape Hatteras from depths of about 8 to 400 meters. Ocean quahogs 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 quahogs 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 quahogs burrow in a variety of substrates and are often associated with fine sand.

Ocean quahogs 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 quahogs have been aged well in excess of 200 years. Growth tends to slow after age 20, which corresponds to the size currently harvested by the industry (approximately 3 inches). Size and age at sexual maturity are variable and poorly known. Studies in Icelandic waters indicate that 10, 50, and 90 percent of female ocean quahogs 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 quahogs are relatively unproductive and able to support only low levels of fishing. The current resource consists of individuals that accumulated over many decades.

Ocean quahogs are suspension feeders on phytoplankton and use siphons which are extended above the surface of the substrate to pump in water. Predators of ocean quahogs 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 - 2018.

	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	2,186[c]	3,400	64%[c]	3,149[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. Dan Hennen Personal Communication, March 22, 2018.

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 online at the NOAA NEFSC website: http://www.nefsc.noaa.gov/. EFH Source Documents, which include details on stock characteristics and ecological relationships, are available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

6.1.2.1 Atlantic Surfclam

The Atlantic 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 online at the NEFSC website: http://www.nefsc.noaa.gov/saw.

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 Atlantic 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 overfished < 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 2016). 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.

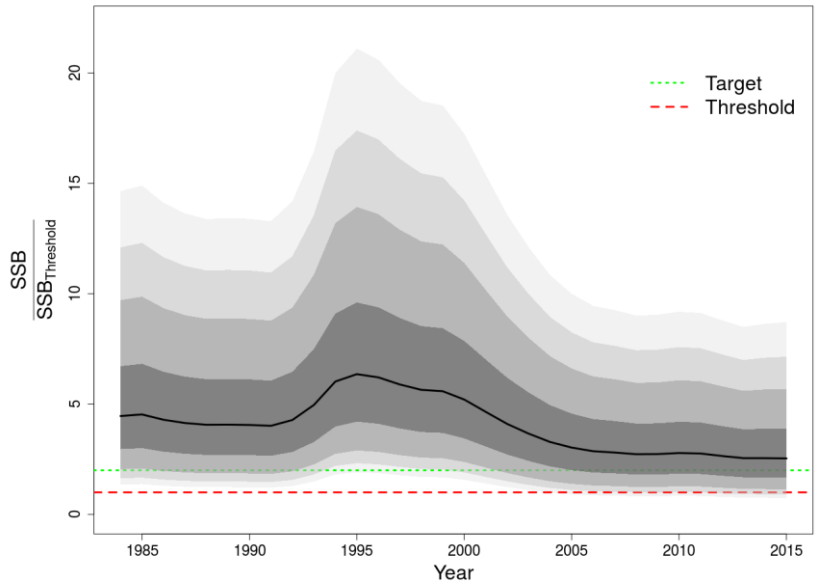


Figure 1. Trends in relative spawning stock biomass (SSB/SSB$_{Threshold}$) for the whole Atlantic surfclam stock during 1984-2015. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The green short-dash 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).

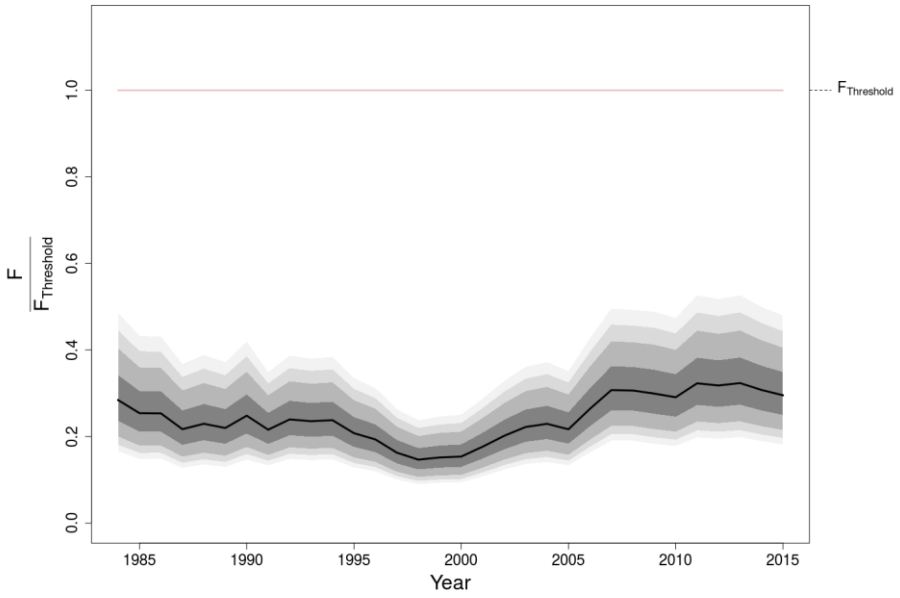


Figure 2. Trends in relative fishing mortality F/F$_{Threshold}$ for the whole Atlantic surfclam stock 1984-2015. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The solid line at F/F$_{Threshold}$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

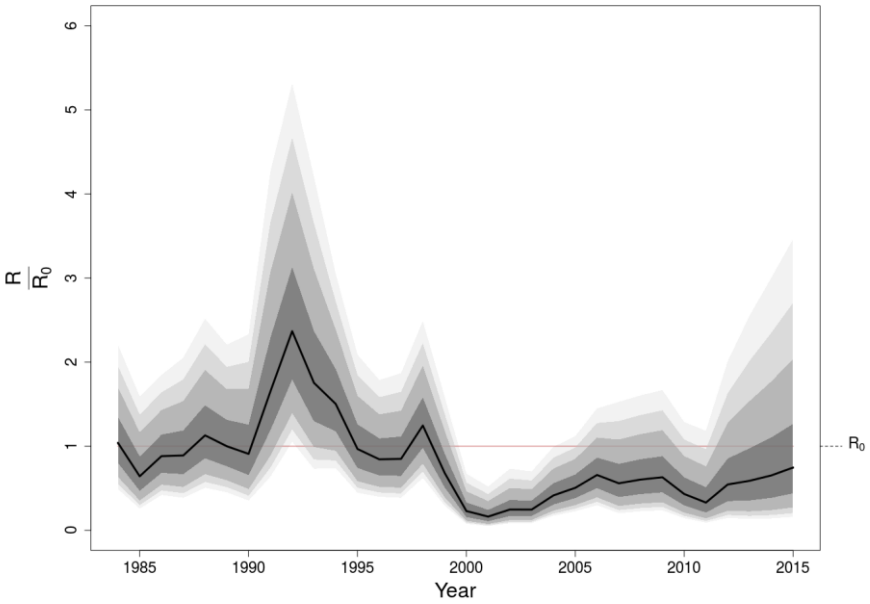


Figure 3. Trends in relative recruitment (R/R_0 for age zero recruits) for the whole Atlantic surfclam stock during 1984-2015. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The horizontal line is 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 online at the NEFSC website: http://www.nefsc.noaa.gov/saw.

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 $F_{2016/FThreshold} = 0.246$ (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).

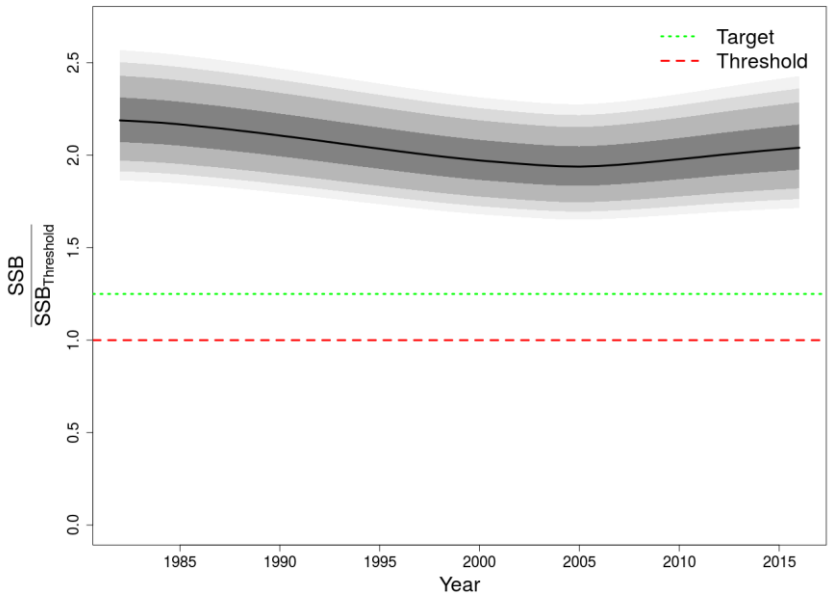


Figure 4. Trends in relative spawning stock biomass (SSB/SSB$_{Threshold}$) for the whole ocean quahog stock during 1982-2016. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The green short-dash line 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 2017).

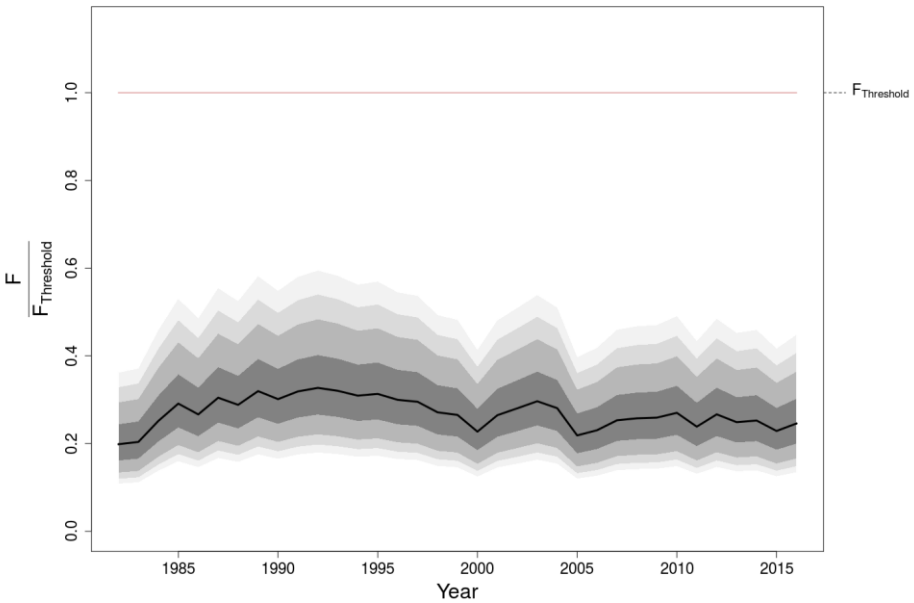


Figure 5. Trends in relative fishing mortality F/F$_{Threshold}$ for ocean quahog stock 1982-2016. *The solid line shows estimates from this assessment with approximate 50, 80, 90, and 95th percentile lognormal confidence intervals in shades of grey. The solid line at F/F$_{Threshold}$ = 1 is the new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

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% percent of trips were observed) in 2016. All species or species categories caught in the dredge, brought on board, and noted and weighed by observers during normal dredging operations are listed in Tables 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 quahogs, and the ocean quahog fishery discards surfclams.

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 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 quahogs caught in observed surfclam trips and vice versa. In all, ocean quahogs contributed with 0.65% of the total catch on observed surfclam trips and surfclams 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 most recent stock assessment information, little skate are not overfished and overfishing is not occurring. According to the 2016 NE Skate Stock Status Update, little skate and winter skate are not overfished and are not subject to overfishing (NEFSC 2015). [22] 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

Surfclams and ocean quahogs 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.

[22] 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 this website:
http://www.nefsc.noaa.gov/nefsc/habitat/efh/. The current designations of EFH by life history stage for surfclam and ocean quahog are provided here:

Atlantic surfclam juveniles and adults: EFH habitat is defined as throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90 percent of all the ranked ten-minute squares for the area where surfclams were caught in the NEFSC surfclam and ocean quahog dredge surveys. Surfclams 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 percent of all the ranked ten-minute squares for the area where ocean quahogs 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 quahogs 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 Table 1 of Appendix C (from Stevenson et al. 2004) and are available at: http://www.greateratlantic.fisheries.noaa.gov/hcd/list.htm.

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). Atlantic 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 (NEFSC 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 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.[23] 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 (NEFSC 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 surfclams and 3.5 inches for ocean quahogs. 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 (NEFSC 2002).

Hydraulic clam dredges can be operated in areas of large-grain sand, fine sand, sand with small-grain gravel, sand with small amounts of mud, and sand with very small amounts of clay. Most tows are made in large-grain sand. Surfclam/ocean quahog dredges are not fished in clay, mud, pebbles, rocks, coral, large gravel >0.5 in (> 1.25 cm), or seagrass beds. For the most part, hydraulic clam dredging is restricted to sandy and muddy sand substrates because the gear can be damaged in hard bottom areas.

In the SASI model, susceptibility and recovery were only evaluated for hydraulic clam dredges for sand and granule-pebble substrates because this gear cannot be operated in mud or in rocky habitats (NEFSC 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.

Hydraulic dredges have higher vulnerability scores than otter trawls and scallop dredges, and much higher vulnerability scores than the fixed gears. Across all gears, geological and biological features are 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 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

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

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 are slightly higher (i.e., recovery times are longer) for hydraulic dredges than for the other two mobile gears fished in similar habitats (sand and granule-pebble). Average recovery values are more similar for biological features across the three mobile gear types, although in a few cases estimated recovery times are 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 an exemption for hydraulic clam dredges in many of the HMAs and included a provision for clam dredge exemption for Georges Bank-Nantucket Shoals for a year after implementation of OHA2 to allow time for the NEFMC to consider creating access areas within two of the areas included in the alternatives. The approved HMAs include: (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, and (g) identifying the existing Gulf of Maine Roller Gear restriction as a habitat protection measure.[24]

As indicated above, the surfclam and ocean quahog fisheries was granted a one year exemption for the Great South Channel and Georges Shoal HMAs following implementation of OHA2, which would allow the NEFMC to consider development of an access program through a framework action for this fisheries. The NEFMC intends through this action to identify areas within the Great South Channel and Georges Shoal HMAs that are currently fished or contain high energy sand and gravel that could 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 is currently under development by the NEFMC and expected to be finalized in 2019.[25]

[24] For additional information see: https://s3.amazonaws.com/nefmc.org/NMFS-Approves-%E2%80%9CMajority%E2%80%9D-of-Council%E2%80%99s-Habitat-Amendment.pdf

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

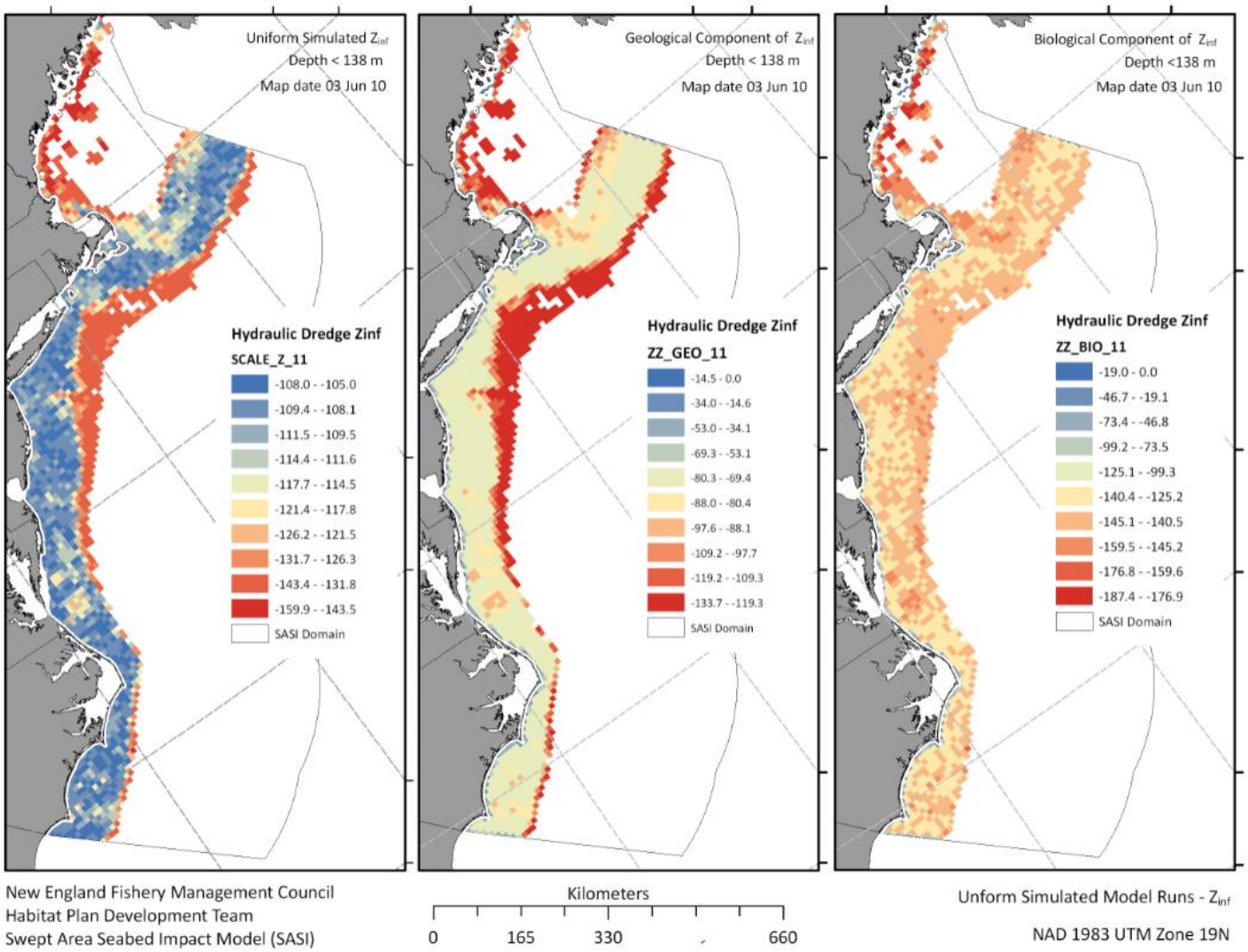


Figure 6. Simulation outputs (Z∞) for hydraulic dredge gear (left panel shows combined vulnerability of geological (mid-panel) and biological features (right-panel); blue=low vulnerability, red=high vulnerability).
Source: https://www.nefmc.org/library/omnibus-habitat-amendment-2

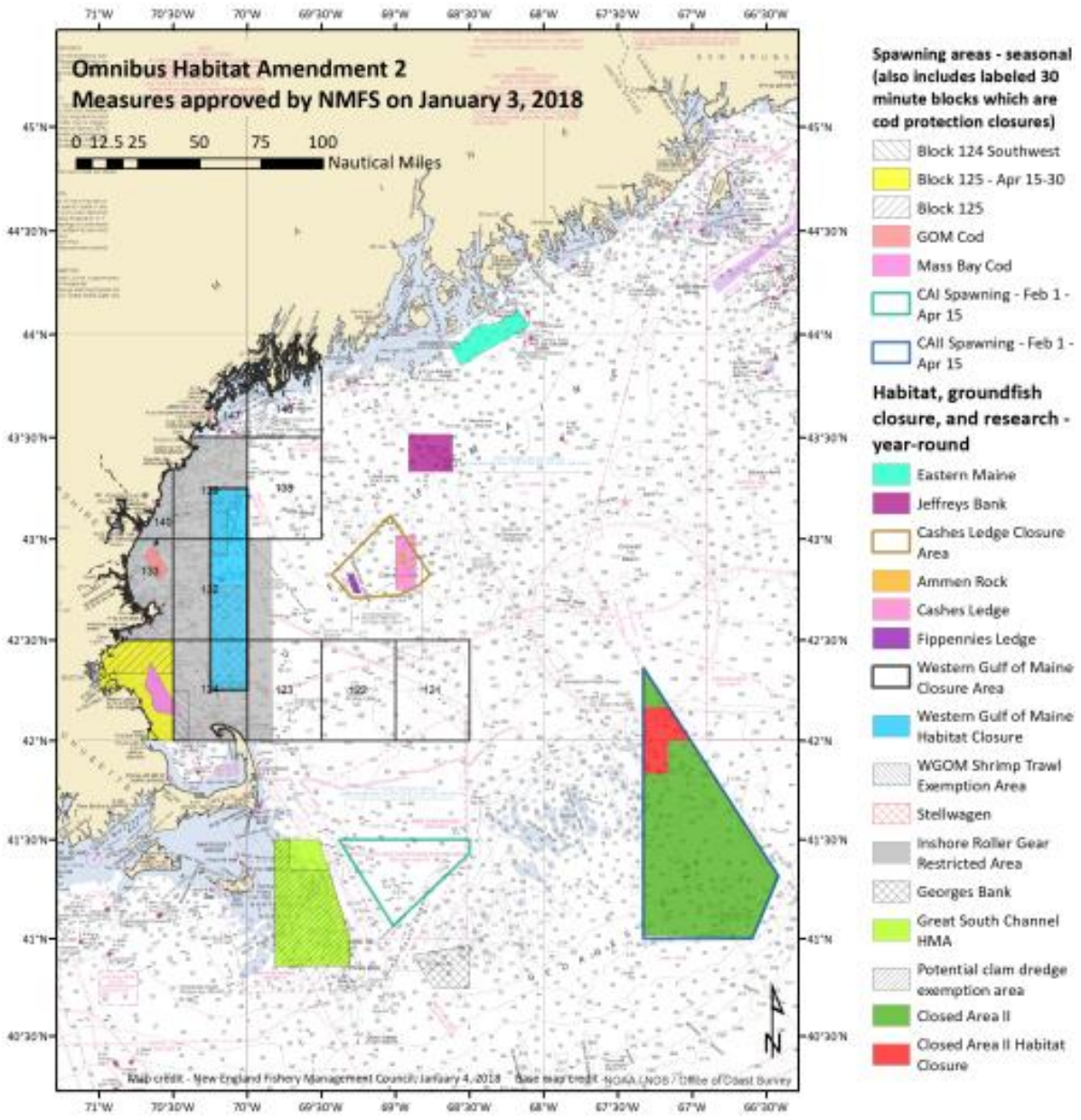


Figure 7. OHA2 approved regulations.
Source: https://s3.amazonaws.com/nefmc.org/NMFS-Approves-%E2%80%9CMajority%E2%80%9D-of-Council%E2%80%99s-Habitat-Amendment.pdf

6.3 ESA and MMPA Protected Species

Numerous protected species inhabit the affected environment of the Atlantic Surfclam and Ocean Quahog FMP (Table 11; Hayes et al. 2017). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the 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: http://www.greateratlantic.fisheries.noaa.gov/Protected/ and http://www.nmfs.noaa.gov/pr/sars/region.htm.

Cusk, alewife, and blueback herring are 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 (see 50 CFR §402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, these species 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, alewife, and blueback herring can be found at: http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm.

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

The commercial fisheries for surfclam and ocean quahogs are prosecuted with 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). Further, this action is not likely to adversely affect any critical habitat for the species listed in 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 NEFSC FSB 2015, 2016, 2017; see http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html and http://www.nmfs.noaa.gov/pr/sars/region.htm; https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries). In the case of 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 or loggerhead (Northwest Atlantic Distinct Population Segment, or DPS) critical habitat and, and therefore, will not result in the destruction or adverse modification of either species critical habitat (NMFS 2014; NMFS 2015a,b).

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.[1]

Species	Status	Potentially affected 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.)[2]	***Protected (MMPA)***	***No***
Pygmy sperm whale (*Kogia breviceps*)	Protected (MMPA)	No
Dwarf sperm whale (*Kogia sima*)	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*)	Protected (MMPA)	No
Atlantic Spotted dolphin (*Stenella frontalis*)	Protected (MMPA)	No
Striped dolphin (*Stenella coeruleoalba*)	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[3]	***Protected (MMPA)***	No
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	No
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	No
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	No
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)	Threatened	No
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	No
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	No
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	No
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	No
Cusk (*Brosme brosme)*	Candidate	No
Alewife *(Alosa pseudoharengus)*	Candidate	No
Blueback herring *(Alosa aestivalis)*	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
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA (Protected)	No

[1] A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal (PBR) level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3 of the MMPA of 1972).

[2] There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.

[3] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins. See Waring *et al.* (2016) and Hayes et al. (2017) for further details.

6.4 Human Communities and Economic Environment

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, etc. are fully described in Amendment 13. Communities from Maine to Virginia are involved in the harvesting and processing of surfclams and ocean quahogs (MAFMC 2003). 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 and 2018b). The small scale Maine fishery is entirely for ocean quahogs, which are sold as shellstock for the half-shell market (MAFMC 2018b). The other fisheries are industrialized ones for surfclams and ocean quahogs, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products (MAFMC 2018a and 2018b).

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 and are available at: http://www.mafmc.org. Recent trends in the fisheries are presented below.

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 surfclams were landed, slighlty lower than 2016 at 2.3 million bushels. The average ex-vessel price of surflcams reported by processors was $13.90 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. 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. The costs to vessels harvesting clams has increased due to the rising costs of insurance; industry has also indicated price of diesel fuel in conjunction with distance traveled to fish is a big factor determining trip cost. Trips harvesting surfclams have increased in length as catch rates have declined (MAFMC 2009, 2010, 2013).

As indicated above, surfclams 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 Quahogs

The total number of vessels participating in the ocean quahog fisheries outside the state of Maine has experienced a downward trend as the fisheries moved beyond a market crisis in 2005 where major users of clam meats 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. The costs to vessels harvesting clams has increased due to the rising costs of insurance; industry has also indicated price of diesel fuel in conjunction with distance traveled to fish is a big factor determining trip cost. Trips harvesting quahogs have also increased in length as catch rates have declined steadily. (MAFMC 2009, 2010, 2013). 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 quahogs 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 quahogs 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 quahogs was presented in Amendment 13 to the FMP (MAFMC 2003).

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 8 and 9. The commercial fishery for ocean quahogs in Federal waters is prosecuted with large vessels and hydraulic dredges, and is very different from the small Maine fishery prosecuted with small vessels (35-45 ft).

6.4.3 Port and Community Description

Communities from Maine to Virginia are involved in the harvesting and processing of surfclams and ocean quahogs. 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 quahogs, which are sold as shellstock for the half-shell market. The other fisheries are industrialized ones for surfclams and ocean quahogs, which are hand shucked or steam-shucked and processed into fried, canned, and frozen products (see section 6.4).

Additional information on "Community Profiles for the Northeast U.S. Fisheries" can be found at: http://www.nefsc.noaa.gov/read/socialsci/communityProfiles.html.

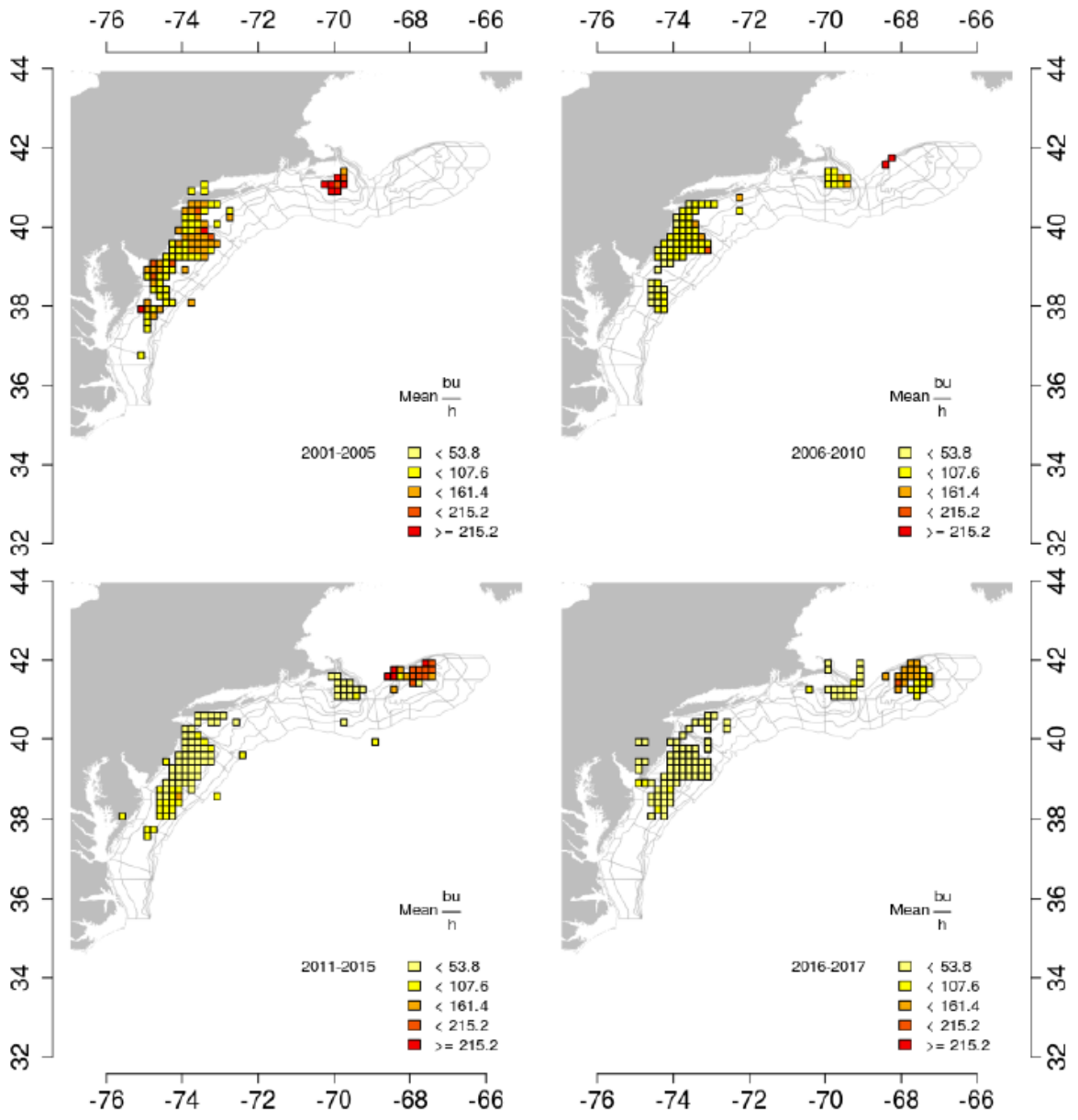


Figure 8. Average surfclam landings per unit effort (LPUE; bu h-1) by ten-minute squares over time, 2001-2016 and preliminary 2017. Only squares where more the 5 kilo bushels were caught are shown. Source: Dan Hennen Personal Communication, March 22, 2018.

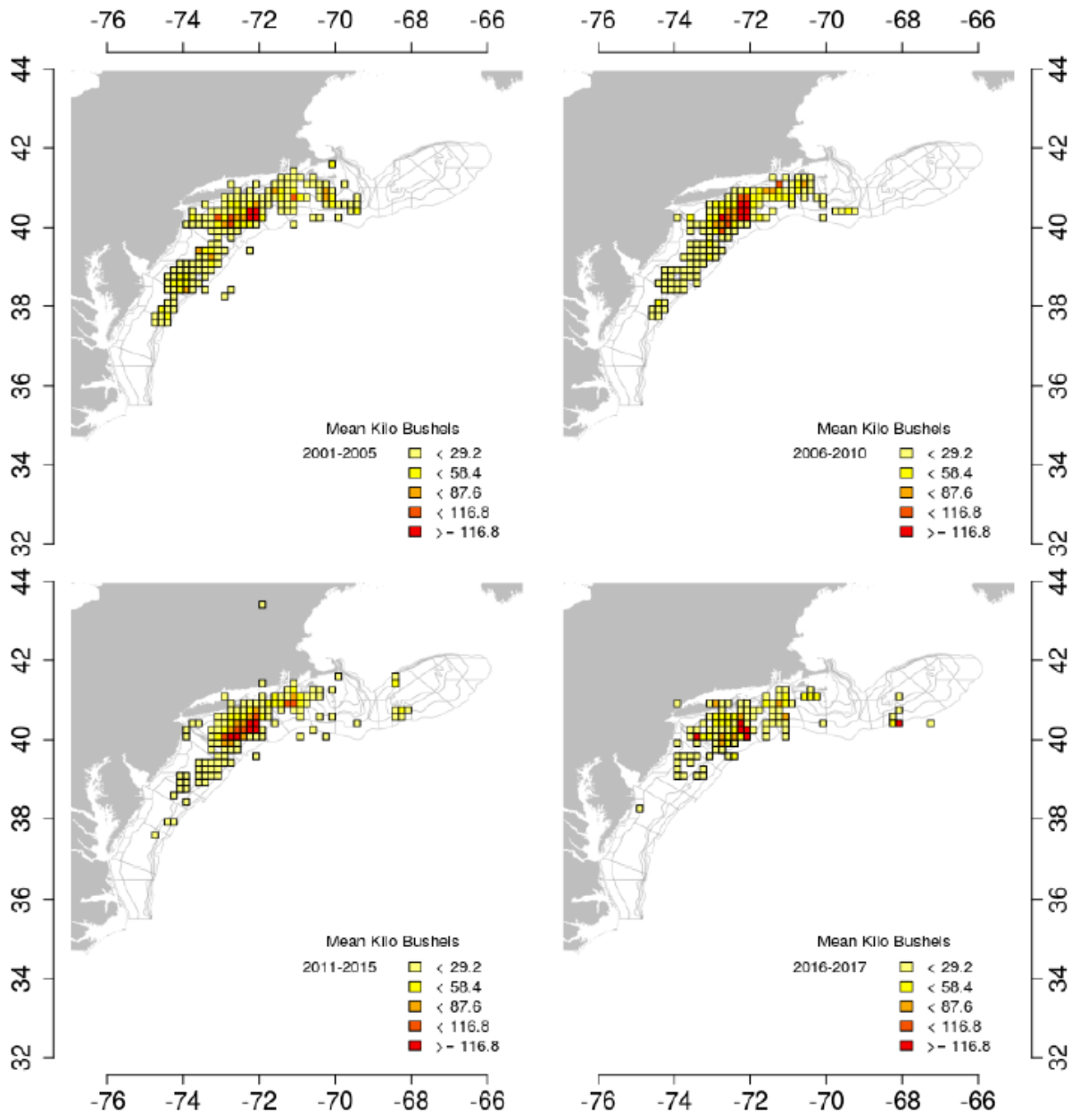


Figure 9. Average ocean quahog landings by ten-minute squares over time, 2001-2016, and preliminary 2017. Only squares where more the 5 kilo bushels were caught are shown.
Source: Dan Hennen Personal Communication, March 22, 2018.

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). [26] The total number of vessels participating in the ocean quahog fisheries outside the state of Maine has experienced a downward trend as the fisheries moved beyond a market crisis in 2005 where major users of clam meats 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. Industry has indicated costs to vessels harvesting clams have increased significantly, with the greatest component being the cost of diesel fuel. Trips harvesting quahogs have also increased in length as catch rates have declined steadily (MAFMC 2009, 2010, 2013). 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 decerase 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.

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 outside of Maine. These 9 companies operated 15 different facilities located in multiple states. They were distributed by state as indicated in Table 13.

[26] 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.

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.

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 the Atlantic surfclam and ocean quahog 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 surfclams and/or ocean quahogs in the Atlantic EEZ from 1979 through 1988. In general terms, the formula for allocating surfclams 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 quahogs, 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).

From the initial implementation of the ITQ system in 1990, there were very limited restrictions on transfer of quota shares (MAFMC 1988). The ITQ program for surfclams and ocean quahogs 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). Since the surfclam and ocean quahog 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.[27] When the ITQ system was implemented, there were 125 vessels participating in the surfclam and ocean quahog fisheries (Färe et al. 2015).

[27] 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.

Trends in Consolidation

As indicated above, the original surfclam and ocean quahog ITQ allocations went to owners of vessels that qualified for the program and the initial ITQ system. The ITQ program provided a great deal of flexibility for transferability of ITQ quota share (sale or lease). Some of the individuals that received initial allocations of ITQ quota share sold out, while others acquired additional shares.

The surfclam and ocean quahog ITQ program contained very few restraints on ownership or transfer of ITQ quota share, 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. 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 had decreased to 73 vessels and the number of active vessels participating in the ocean quahog fisheries had increased to 76 vessels (Brinson and Thunberg 2013, 2016). There have been further reductions in the number of active vessels participating in these fisheries through time. In 2017, there were 48 vessels participating in these fisheries in (Table 12). One of the goals of the ITQ system in these fisheries was to reduce fleet capacity. From this perspective the program has met this goal, 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 Atlantic surfclam allocation of 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 period, ranging from 107 to 117 (Brinson and Thunberg 2013). However, 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).[28]

There were 117 entities (i.e., unique ocean quahog allocation holders) that received an initial ocean quahog allocation of 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

[28] Available at: https://www.greateratlantic.fisheries.noaa.gov/sustainable/species/clam/

and Thunberg 2013). However, since 2004 the number of entities holding surfclam quota share declined from 56 (Brinson and Thunberg 2013) to 37 in 2017 (2017 Atlantic surfclam ITQ Allocation Holder Report).[28]

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. 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. The costs to vessels harvesting clams has increased due to the rising costs of fuel and insurance. Trips harvesting surfclams have increased in length as catch rates have declined. 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 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 Atlantic surfclam and ocean quahog 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) results in that 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. As a result of the need to harvest on a schedule, virtually all clams are sold under contract between processors and harvesters or are harvested by processor affiliates (Mitchell et al. 2011).

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

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 surfclams or ocean quahogs. The Herfindahl-Hirschman Index (HHI; an indicator of the amount of competition in the market place)[29] of purchases by processors grew between 2003 and 2008 from 2,068 to 3,134 for surfclams and from 3,431 to 4,369 for ocean quahogs (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 surfclams and ocean quahogs 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 surfclams in 2008 was 4,080 and the HHI of harvesting activity for ocean quahogs 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).

[29] 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.

Brief Discussion on Market Power and Impacts on Competition

The Atlantic 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), the input market (monopsony; a single buyer) 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.[30] 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.[31] 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) is currently being exercised through withholding of

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

[31] 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).

quota in the surfclam and ocean quahog fisheries.[32] It is possible that under some circumstances an excessive share cap 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 had been 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[33] are also consistent with a monopsony scenario. Given that this is a vertically integrated industry and there with a small number of vessels and processors 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).

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 SCOQ ITQ program period 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 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 surfclams 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;

[32] The Compass Lexecon report did not analyse 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).

[33] 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).

5) changing the federal fishery [fisheries] management program from effort-based regulations to individual transferable quotas. Decoupling harvest rights from vessels allowed unneeded vessels to exit the fishery [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 surfclams and ocean quahogs 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 the ocean quahog fishery, the proportion of cage tags not used is higher for small allocation owners when compared to large allocation owners for the 2004-2006 and 2017 periods. 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 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 relative closer to each other when larger proportions of the available quotas are harvested.

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 brake them into two groups.

Landings, Quota Utilization, and Market Trends

Surfclams and ocean quahogs are processed into a variety of different products. Traditionally, surfclams' dominant use 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). Traditionally, the dominant use of ocean quahogs has been in products such as soups, chowders, and white sauces. Their small meat has a sharper taste and darker color than surfclams, 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 surfclams and ocean quahogs are shown in Figures 10 and 11, respectively. As previously indicated, the surfclam and ocean quahog ITQ system was implemented in 1990. For most years from 1990 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 somewhat below the quota. Due to limited markets, surfclam landings have not reached the quota of 3.4 million bushels since it was set in 2004 (NEFSC 2017a). It should be noted that both changes in landings and the changes in quota levels affect the quota utilization shown in Figures 10 and 11. 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 surfclams is observed (Figure 10).

On the other hand, ocean quahog linings have consistently been below the quota for most years since 1990. Industry utilization of ocean quahogs has varied across the years, influenced by market conditions and the costs of harvesting ocean quahogs. There was a shift toward greater utilization of quahog meats 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, and it became relatively more expensive to harvest ocean quahogs which are found farther offshore. Higher fuel prices combined with the 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 quahogs 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 quahogs is observed (Figure 11). 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. Due to limited markets, ocean quahog landings have not reached the quota of 5.3 million bushels since it was set in 2005 (NEFSC 2017b).

The reduction in landings for surfclams and ocean quahogs in the mid-2000s was due to several factors. Major users of clam meats 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 (MAFMC 2009, 2010, 2013). More recently, processors report that imported clams are available from a relatively large number of countries, including Canada, Thailand, Vietnam, China, and Chile (Mitchell et al. 2011). Surfclam and ocean quahog landings have been mainly constrained by market limitations.

Industry members have consistently asked the MAFMC to set the surfclam and ocean quahog quotas at levels lower than allowable catch limits. However, industry has also asked the Council to set the quotas for these two species at levels that are larger than the market demand since the mid-2000s.

In 2017, there were companies that reported purchases of surfclam and/or ocean quahog from the industrial fisheries outside of Maine. These 9 companies operated 15 different facilities located in various state. Some of 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 are harvested and processed to meet set schedules.

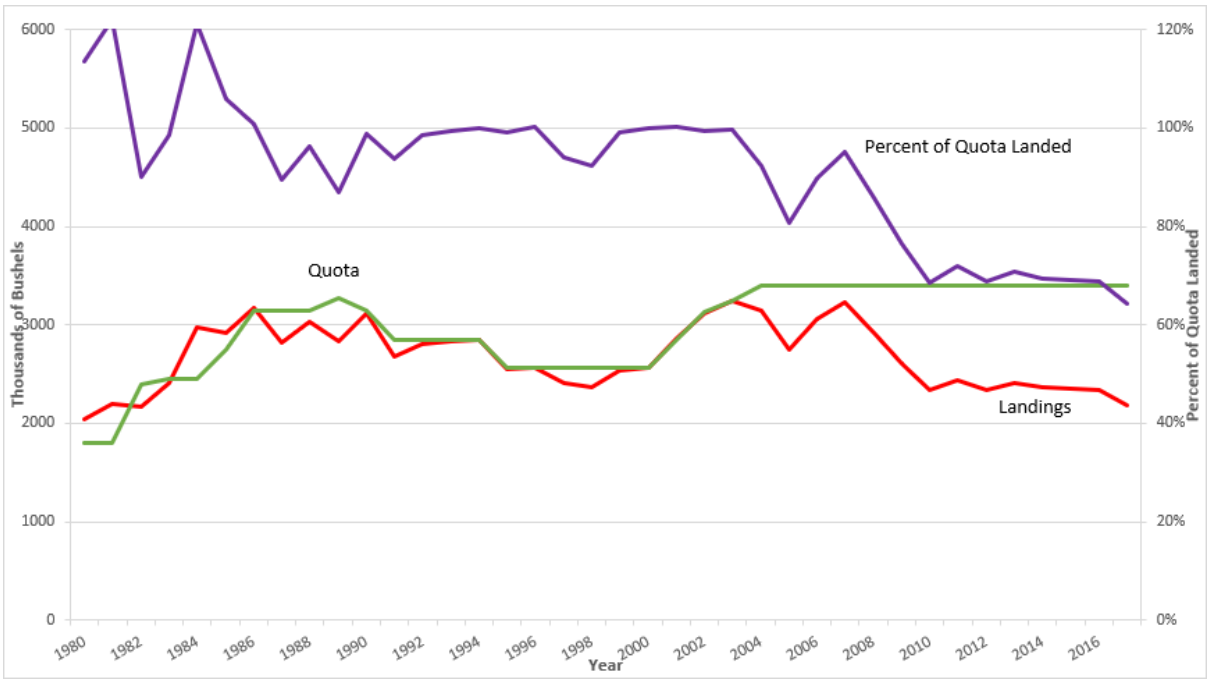


Figure 10. Surfclam landings, quota, and percent of quota landed, 1980-2017.
Source: NMFS Clam Vessel Logbook Reports. Dan Hennen Personal Communication, March 22, 2018.

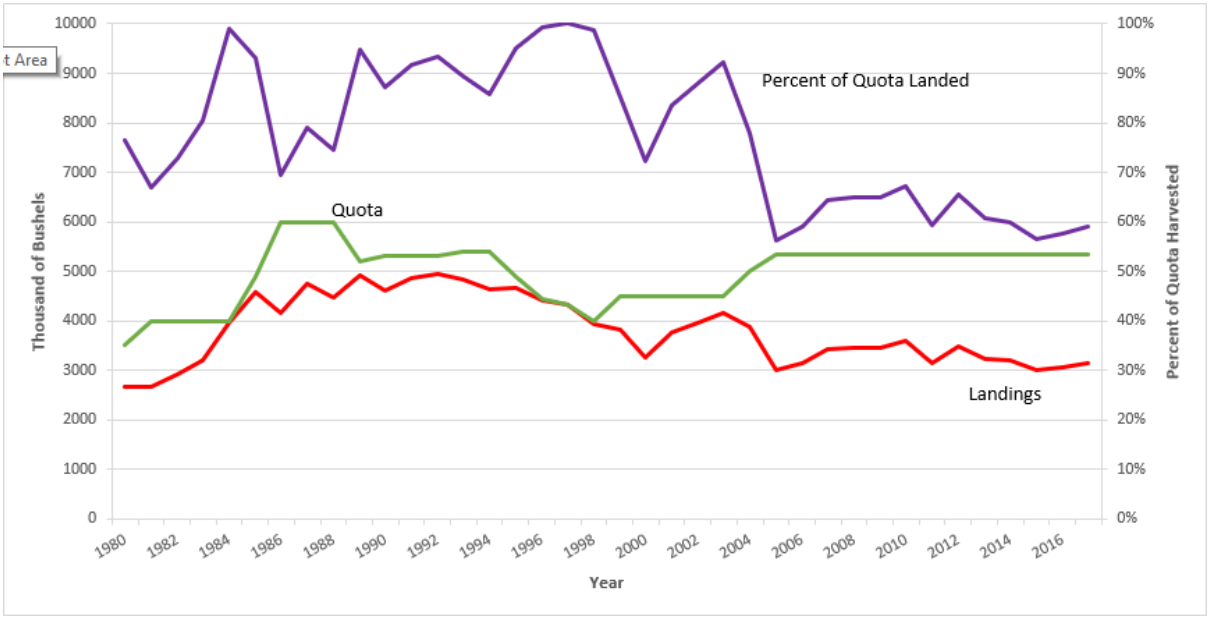


Figure 11. Ocean quahog landings, quota, and percent of quota landed, 1980-2017.
Source: NMFS Clam Vessel Logbook Reports. Dan Hennen Personal Communication, March 22, 2018.

Ex-vessel Revenues and Prices

Figures 12 to 15 show ex-vessel revenues and prices for surfclams and ocean quahogs in nominal and real values. As previously indicated (Trends in Consolidation Section), a series of conditions resulted in a substantial portion of the industrial fleet leaving the clam fishery that year. In addition, as previously mentioned, major users of clam meats had 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. These conditions combined resulted in a large decrease in revenues for both species in 2005.The costs to vessels harvesting surfclams and ocean quahogs increased due to the rising costs of fuel and insurance (MAFMC 2009, 2010, 2013). However, nominal ex-vessel prices remained relative stable during that period (Figures 14 and 15).

After the large surfclam ex-vessel revenue decrease in 2005, ex-vessel revenues increased to the 2003 levels, and then have a decreasing trend through 2010 (Figure 12). From 2010 through 2017, surfclam ex-vessel revenues have shown a slight upward trend despite low quota utilization (Figure 10) and significant decrease in the efficiency of harvesting operations (Figure 16). Ex-vessel prices for surfclam have been relatively stable for the 2010 through 2017 period with slight increases (Figure 14).

Ex-vessel price 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 price for both species show a steady upward trend from 2009-2017 (Figures 14 and 15).

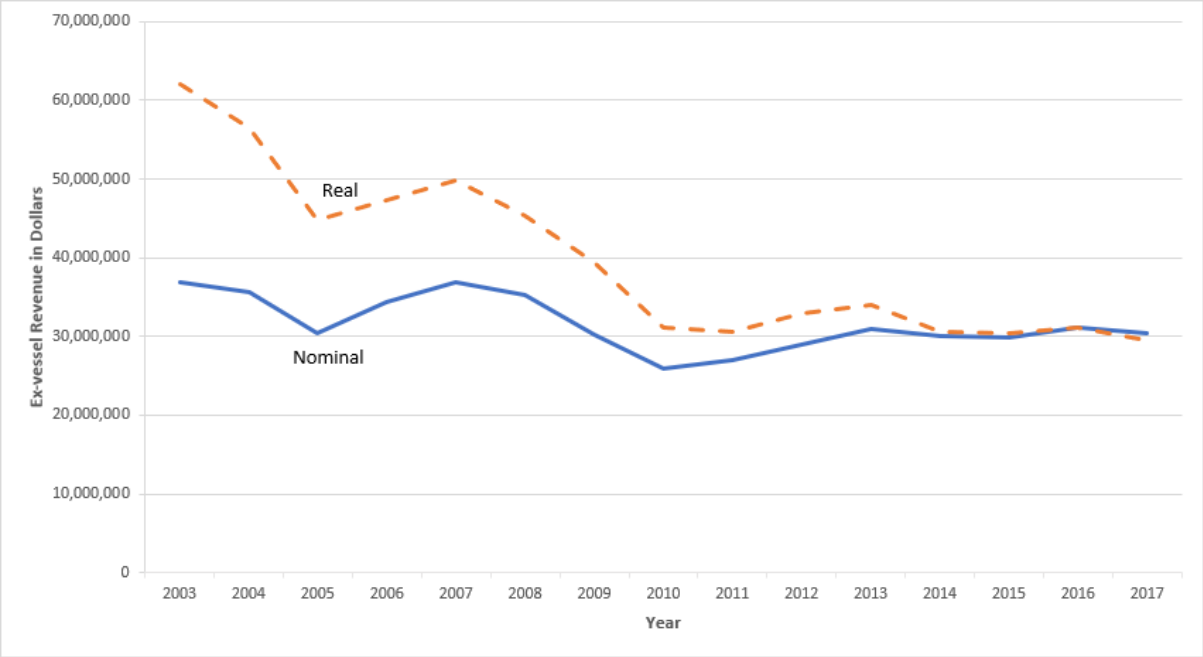


Figure 12. Surfclam ex-vessel revenue, 2003-2017.

Source: Dealer data, NMFS. The Producer Price Index (PPI) used to convert nominal dollars to 2016 dollars is for unprocessed and package fish, which includes shellfish and fish.

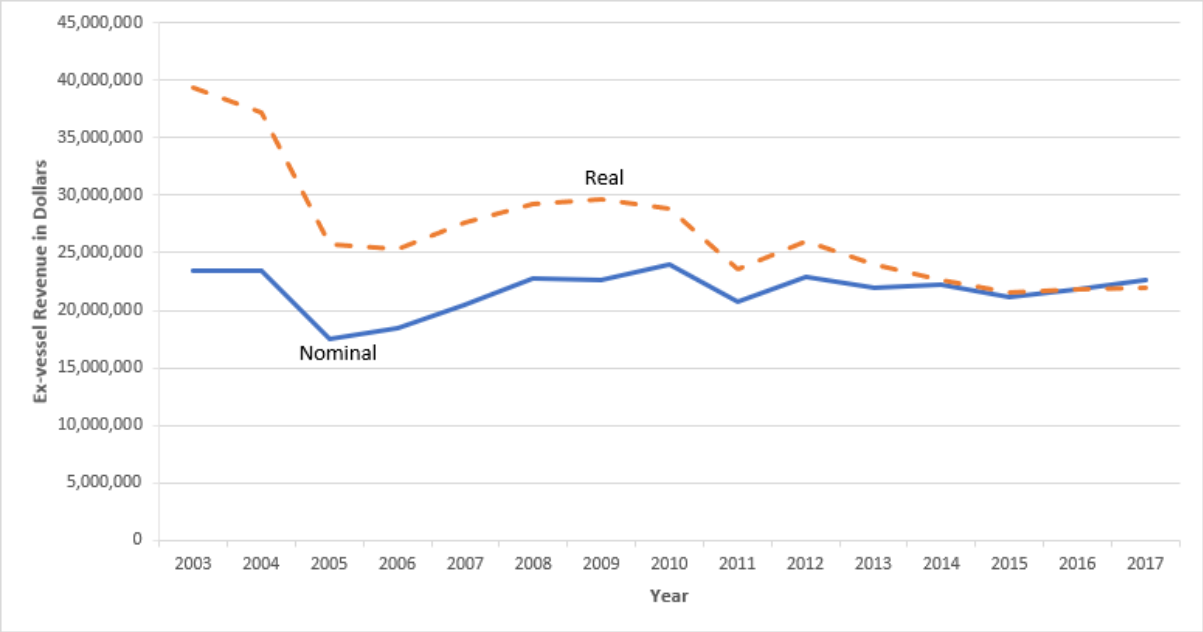


Figure 13. Ocean Quahog ex-vessel revenue, 2003-2017.

Source: Dealer data, NMFS. The Producer Price Index (PPI) used to convert nominal dollars to 2016 dollars is for unprocessed and package fish, which includes shellfish and fish.

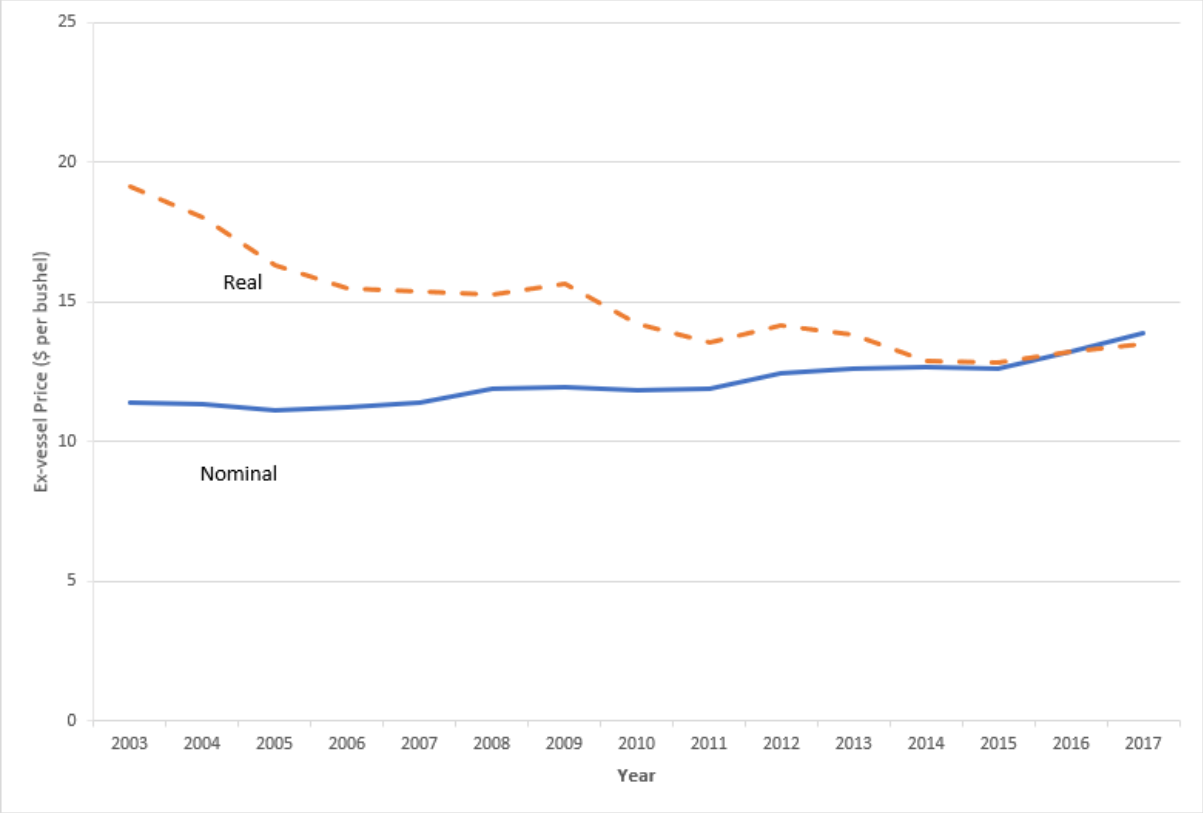


Figure 14. Surfclam ex-vessel price ($/bu), 2003-2017.

Source: Dealer data, NMFS. The Producer Price Index (PPI) used to convert nominal dollars to 2016 dollars is for unprocessed and package fish, which includes shellfish and fish.

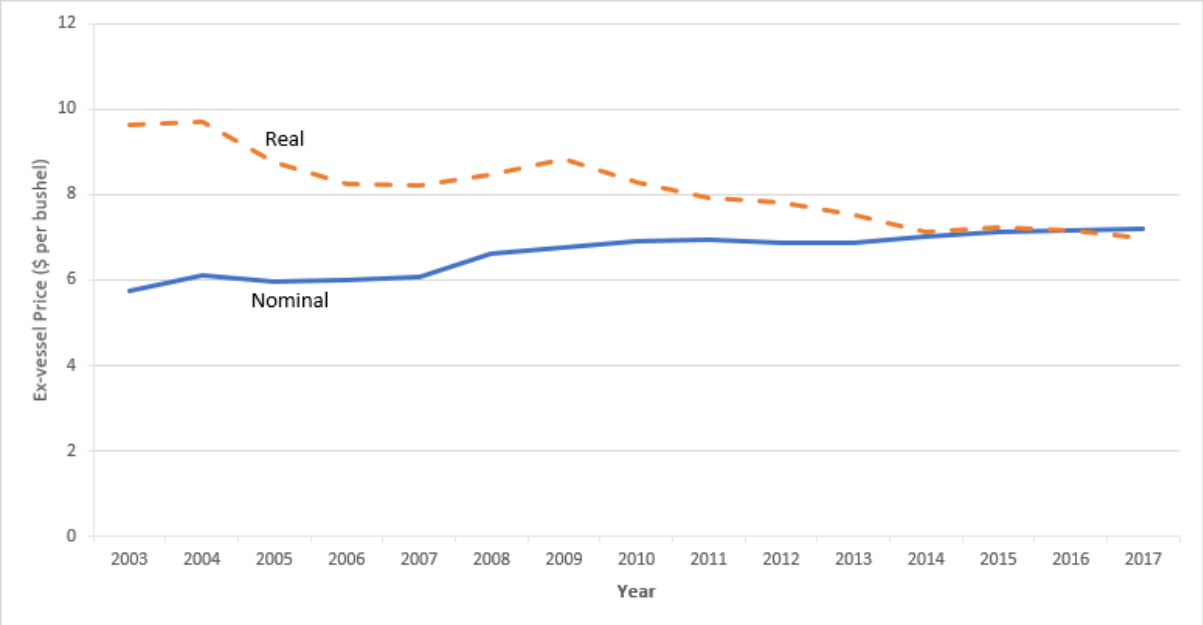


Figure 15. Ocean quahog ex-vessel price ($/bu), 2003-2017.

Source: Dealer data, NMFS. The Producer Price Index (PPI) used to convert nominal dollars to 2016 dollars is for unprocessed and package fish, which includes shellfish and fish.

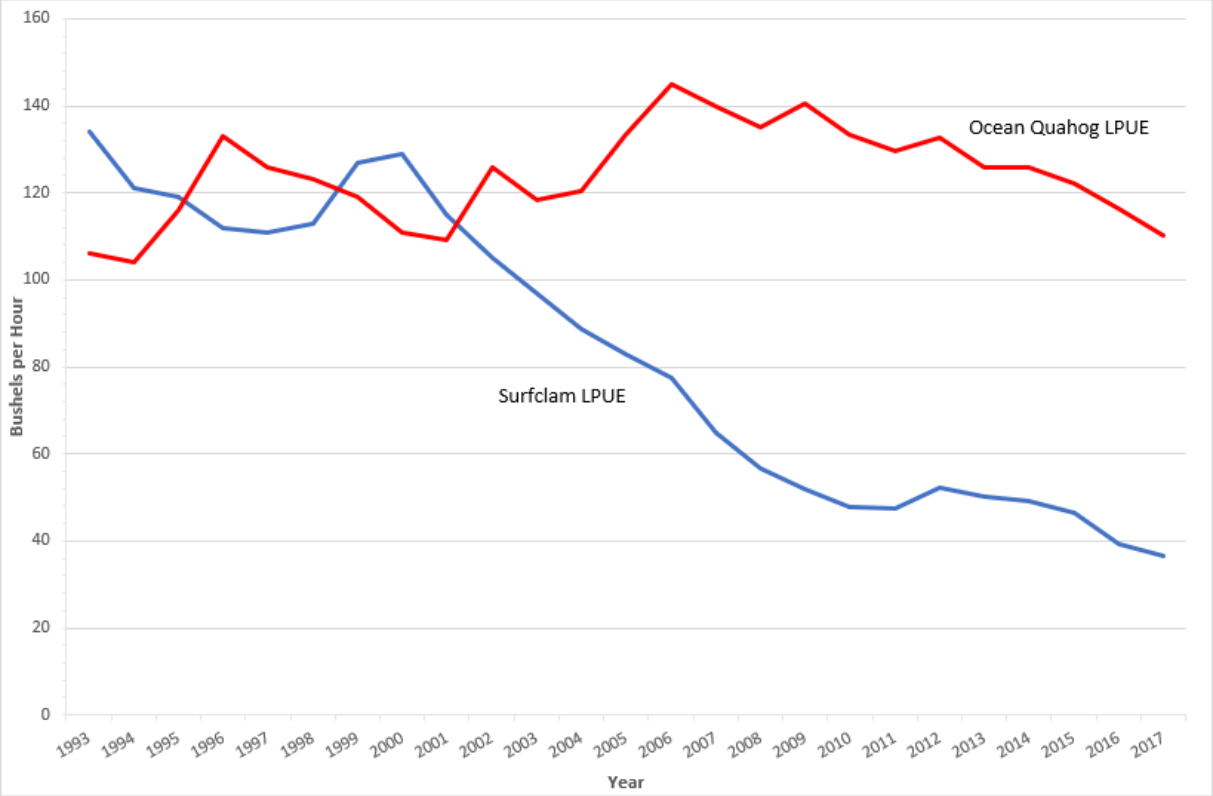


Figure 16. Surfclam and ocean quahog landings per unit effort (LPUE), 1993-2017.
Source: NMFS Clam Vessel Logbook Reports.

Economic Performance - Harvesting Sector

Prior to the implementation of the Atlantic surfclam and ocean quahog ITQ program, excess harvesting capacity (overcapitalization) was a major problem and led to closures very quickly due to effort 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 have not 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 management measure that constrained the time (e.g., effort restrictions) that vessels could fish for surfclams, both, small and large vessels harvested similar quantities of surfclams. 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 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 least cost combination of fishing inputs (e.g., fuel, labor, materials) since they allocated an exclusive share of the annual catch limit. In other words, they are incentivized to harvest the resource in a manner that is least costly to them, 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 Atlantic 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 17). 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 quahogs, 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 17). The largest increase was in 21% in 2005 (1.21), while the largest decline was 13% in 2000 (0.87). For the entire period, the average year-to-years change was there percent (1.03).

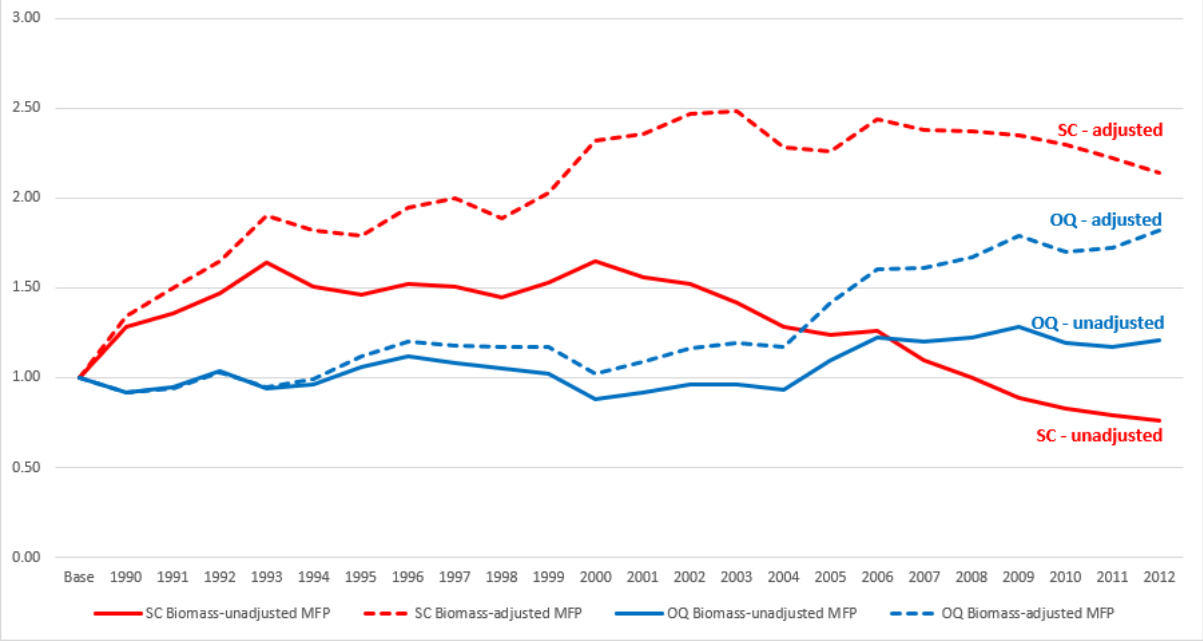


Figure 17. Biomass-unadjusted and biomass-adjusted marginal factor productivity for surfclam and ocean quahog, base period (1997-1989) to 2012.

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 quahogs, 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 set 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 lease 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	Average years 1-3	Average years 1-5	Last 5 year average	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 conduct a review of the Atlantic 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 being conducted by Northern Economics, Inc. will fulfill the program review requirements as described in the guidance for catch share reviews (NMFS 2017). The program review is expected to be completed in Spring 2019.

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 or definition of an excessive share is included in the FMP)
- Alternative 2: Single Cap – Quota share ownership-only with unlimited leasing of annual allocation (cage tags)
  - Sub-Alternative 2.1: Quota share cap based on highest level in the ownership data, 2016-2017
  - Sub-Alternative 2.2: Quota share cap at 49%
  - Sub-Alternative 2.3: Quota share cap at 95%
- Alternative 3: Combined Cap – Combined quota share ownership plus leasing of annual allocation (cage tags)
  - Sub-Alternative 3.1: Combined cap based on highest level in the ownership data, 2016-2017
  - Sub-Alternative 3.2: Combined cap at 40%
  - Sub-Alternative 3.3: Combined cap at 49%
- Alternative 4: Two-Part Cap Approach – A cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (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: Ownership quota share cap at 30% and combined cap at 60%

- Alternative 5: Cap based on a 40% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota
- Alternative 6: Cap based on a 49% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota

Excessive Shares Review Alternatives

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

Framework Adjustment Process

- Alternative 1: No Action/*Status Quo* (No changes to the current list of measures that can be addressed under the framework adjustment process)
- Alternative 2: Add modification of the excessive share cap levels to the list of measures to be adjusted via framework

Multi-Year Management Measures

- 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: Allow for specifications to be set for a maximum number of years consistent with the 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 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 allow for recovery 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 limit the recovery potential of some currently degraded areas and therefore result in slight negative impacts. The commercial

fisheries for surfclam and ocean quahogs 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. Lastly, measures that would curtail entities from exerting market power and therefore decreasing competition would also have positive socioeconomic impacts.

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 alternatives presented in this document or the other alternatives analyzed (i.e., cap review; framework adjustment process; and multi-year management measures) are purely administrative and are not

expected to have any impact on fishing methods and practices and are not expected to result in changes in fishing effort or redistribution in fishing effort. 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., baselines) 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 maintain or are projected to result in a stock status above an overfished condition*	Alternatives that 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 (i.e., no take)	Alternatives that result in interactions/take of listed species, 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 maintain takes below PBR and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammals 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 and slow recovery time (see condition of the resources table)	Alternatives that improve the quality or quantity of habitat or allow for recovery	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
	Moderate (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.

VEC		Baseline Condition	
		Status/Trends, Overfishing?	**Status/Trends, Overfished?**
Target stocks (section 6.1.1)	**Atlantic surfclam**	No	No
	Ocean quahog	No	No
Non-target species (principal species listed in section 6.1.2)	**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 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 surfclams and ocean quahogs respectively. 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.	

7.1 Impacts on Atlantic Surfclam and Ocean Quahog (Managed Species) and Non-Target Species

Excessive Shares Alternatives

Under alternative 1 (no action), no limit 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 these clam 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 these clam 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 Atlantic surfclam and ocean quahog ITQ privileges. 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 no impacts on both target species, and non-target species.

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), 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 and ocean quahog commercial fisheries. Alternative 1 is expected to have the same impacts as alternative 2.

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.

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 alternative 1 (no action), 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* measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap to be modified via the framework adjustment process. 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 share cap level to the list of frameworkable actions in the FMP. This frameworkable item would provide means to make modifications to the 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 select cap), only if the modification would not result in an entity having to divest. 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.

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), 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 is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Alternative 2 would allow for specifications to be set for a maximum number of years 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).

7.2 Impacts on the Physical Habitat and EFH

As described in section 7.0, the commercial fisheries for surfclam and ocean quahogs 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.

Excessive Shares Alternatives

Under alternative 1 (no action), no limit 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 Atlantic surfclam and ocean quahog ITQ privileges. 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 no impacts on habitat, including EFH.

Excessive Shares Review Alternatives

Under alternative 1 (no action), 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.

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.

Framework Adjustment Process Alternatives

Under alternative 1 (no action), 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* measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap 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 share cap level to the list of frameworkable actions in the FMP. This frameworkable item would provide means to make modifications to the 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 select 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.

Multi-Year Management Measures Alternatives

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. 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 as this action deals entirely with the periodicity by which the annual management measures are specified. Alternative 2 would allow for specifications to be set for a maximum number of years 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 on Protected Resources

Excessive Shares Alternatives

Under alternative 1 (no action), no limit 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 these clam 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 (see 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 no impacts to protected species (see below for rationale).

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 Atlantic surfclam and ocean quahog ITQ privileges. These alternatives are expected to have no impact on the prosecution of these clam 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 (see 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 no impacts on protected species.

Excessive Shares Review Alternatives

As described above (under excessive shares 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 these clam 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), 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.

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.

Framework Adjustment Process Alternatives

As described above (under excessive shares 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 these clam 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 alternative 1 (no action), 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* measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap 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 share cap level to the list of frameworkable actions in the FMP. This frameworkable item would provide means to make modifications to the 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 select 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.

Multi-Year Management Measures Alternatives

As described above (under excessive shares 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 these clam 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), 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 is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Alternative 2 would allow for specifications to be set for a maximum number of years 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 to Communities (Socioeconomic Impacts)

Excessive Shares Alternatives

Under alternative 1 (no action), no limit 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 NS4 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. Department of Justice (DOJ) which would determine if antitrust laws were being violated. 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 Atlantic surfclam and ocean quahog fisheries. The DOJ indicated that their Business Practice Process does provide a pre-enforcement review and advisory options for certain select transactions. However, the type of scenarios for which the Business Review Process[34] has been used in the past have been for much larger, economically significant deals between companies than is envisioned by the Excessive Shares Amendment.[35]

Therefore, 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) in these fisheries.

[34] For a detailed description of the Business Review process of the DOJ see: https://www.justice.gov/
[35] Sarah Heil, letter to Chis Moore, PhD, June 1, 2018.

In addition, it is argued that the availability of substitutes is the most important of the factors listed in determining the elasticity of demand[36] 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), it could create market power in the input market (monopsony) 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[37] 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 decerase 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.

[36] 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.

[37] 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).

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 landings or ex-vessel revenues are expected when compared to current conditions. However, under alternative 1, there would be no limit 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.

Under alternative 2, a single cap on how much quota share one individual or entity could hold would be established separately for surfclams and ocean quahogs. The cap would be based on quota share ownership with unlimited leasing of annual allocation (cage tags)[38] throughout the year.[39] Because alternative 2 is based on ownership-only values, none of the sub-alternatives discussed below account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without Government oversight.

Under Sub-Alternative 2.1, the single quota share 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 (i.e., surfclams and ocean quahogs) for the 2016-2017 period.[40] The single caps under this alternative would depend on the determination of ownership quota shares 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 (e.g., 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 for the 2016-2017 period. 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 office 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 quahogs was 22% under both the net actual percentage model and

[38] There would be no limit of how much annual allocation (cage tags) an individual or entity could use or transfer during the fishing year.
[39] All excessive share alternatives are applicable throughout the year.
[40] On average, for the 2016-2017 period, 67% of the surfclam quota and 58% of the ocean quahog quota were landed (Table 4).

cumulative percentage model regardless of affiliation levels analyzed for the same reasons identified above for surfclams (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 surfclams and 22% for ocean quahogs (Tables 2 and 3). A 28% cap for surfclams could potentially result in a minimum (if fully consolidated) of four large entities participating in the fishery (i.e., four large entities at 28%, 28%, 28%, and 16%). This implies at least four entities holding surfclam quota, which may provide some protection against predation or foreclosure of competitors. A 22% cap for ocean quahogs could potentially result in a minimum of five large entities participating in the fishery (i.e., five large entities at 22%, 22%, 22%, 22%, and 12%).[41] 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).

The number of entities above and below specific maximum cap values for the various alternatives and sub-alternatives discussed in section 7 are presented in Tables 18-21.[42] If the surfclam and ocean quahog cap levels described above (28% and 22%, respectively) had been implemented in 2017, all entities would have fallen at or below those quota share caps regardless of ownership percentage model (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 business practices (e.g., combined ownership plus leasing) 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 Government 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 surfclams, 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 landings or 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 share consolidation and associated market power issues. As previously indicated, an excessive share would be a level of quota control that results in market power for a firm or entity. An outcome of obtaining market power could be pricing power in either

[41] The resulting number of minimum entities under excessive shares 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 be driven out of business.

[42] See Box 7.4 (on page 119) for a brief description of common terminology and definitions used in Tables 18-21.

output (product), or input (factor) markets, or the ability to disrupt other firms or entities from participating in the market.

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 cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 business practices (e.g., combined ownership plus leasing) 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 Government 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 surfclams, 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 landings or 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 share consolidation and associated market power issues. As previously indicated, an excessive share would be a level of quota control that results 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.

Under Sub-Alternative 2.3, the single cap would be 95% for surfclams and 95% for ocean quahogs. This sub-alternative is based on the recommendations made by some industry representatives. The 95% level was grounded on the argument that industry participants cannot exert market power in the final product market (monopoly). 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 share cap 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). Lastly, 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), it could create market power in the input market (monopsony) 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[43] 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.

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 landings or 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.

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 where 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. 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. 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 18). An excessive-share cap of 28% for surfclams and 22% for ocean quahogs 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,

[43] 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).

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 for surfclam and/or ocean quahogs).

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. 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.

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 the least positive impacts.

Table 18. Potential impacts of sub-alternatives 2.1, 2.2, and 2.3 (Single Cap – Quota share ownership-only with unlimited leasing of annual allocation (cage tags)) for various maximum quota ownerships at the individual/business level, family level, and corporate officer level.

	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 cap only with unlimited leasing of annual allocation (cage tags); 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
max # 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
max # 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 cap only with unlimited leasing of annual allocation (cage tags); this cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing												
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
max # 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
max # 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 cap only with unlimited leasing of annual allocation (cage tags); 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
max # 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
max # 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

Table 19. Potential impacts of sub-alternative 3.1, 3.2, and 3.3 (Combined Cap – Combined quota share ownership plus leasing of annual allocation (cage tags)) for various maximum quota ownerships at the individual/business level, family level, and corporate officer level.

	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 - Combined Cap –Combined quota share ownership plus leasing of annual allocation (cage tags); cap based on highest level in the ownership 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
max # 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
max # 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 - Combined Cap – Combined quota share ownership plus leasing of annual allocation (cage tags); cap at 40% based on recommendations provided in the Compass Lexecon Report												
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
max # 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
max # 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 - Combined Cap – Combined quota share ownership plus leasing of annual allocation (cage tags); cap at 49% based on the tilefish IFQ cap (i.e., ownership plus leasing)												
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
max # 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
max # 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

Table 20. Potential impacts of sub-alternative 4.1, 4.2, and 4.3 (Two-Part Cap Approach – A cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags)) for various maximum quota ownerships at the individual/business level, family level, and corporate officer level.

	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 cap on combined quota share ownership plus leasing of annual allocation (cage tags); cap based on highest level in the ownership 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
max # 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
max # 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 cap on combined quota share ownership plus leasing of annual allocation (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
max # 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
max # 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
Sub-Alternative 4.3 - Two-Part Cap Approach – A cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags); cap based on ownership quota share at 30% and combined 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
max # 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
max # 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

Table 21. Potential impacts of alternative 5 (Cap based on a 40% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota) for various maximum quota ownerships at the individual/business level, family level, and corporate officer level.

	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 6 - Cap based on a 40% quota share ownership-only with unlimited leasing of annual allocation (cage tags) plus a two-tier quota												
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
# max 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
# max 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 alternative 3, a combined cap would be implemented – combined quota share ownership plus leasing of annual allocation (cage tags). Because alternative 3 is based on combined ownership plus leasing of annual allocation (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). This alternative imposes a combined limit on ownership plus leasing, which would account for transactions and complex business practices that occur in these fisheries.

Under sub-alternative 3.1, the cap would be based on the highest level of combined cap held by any individual or entity reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) for the 2016-2017 period. The species-specific cap levels do not have to be the same for surfclam and ocean quahogs. The combined caps under this alternative would depend on the determination of combined levels (quota share ownership plus cage tag leasing) 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 (e.g., affiliate levels) are presented in Tables 2 and 3.

Under sub-alternative 3.1, depending on the affiliate level and model selected, the combined 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 combined cap values, sub-alternative 3.1 could result in a minimum number of large entities 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 combined cap for ocean quahogs 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 quahogs, this sub-alternative could result in a minimum number of large entities ranging from four under the net actual percentage model to three under the cumulative 100% model (Table 19).

If the surfclam and ocean quahog combined cap levels described above had been implemented in 2017, all entities would have fallen below those combined caps regardless of ownership percentage model (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; Table 19). As such, no entity would have been constrained by the combined 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 landings or ex-vessel revenues are expected when compared to current conditions. However, 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 share consolidation and associated market power issues. In addition, since this alternative would implement a combined 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 would be a level

of quota control that results 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.

Under sub-alternative 3.2, the combined cap would be 40% for surfclams and 40% for ocean quahogs. This is based on recommendations provided in the Compass Lexecon Report and corresponding CIE review (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 [ensure] that there would be at least three processors operating at reasonable output levels" (Walden 2011). A 40% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., three large entities at 40%, 40%, and 20%; Table 19).

If the surfclam and ocean quahog combined cap levels described above (40% for surfclam and 40% for ocean quahog) had been implemented in 2017, all entities would have fallen below those combined caps under the net actual percentage model for both surfclams and ocean quahogs. 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 had combined cap 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 landings or ex-vessel revenues are expected when compared to current conditions. However, 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 share consolidation and associated market power issues. In addition, since this alternative would implement a combined 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 would be a level of quota control that results 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.

Under sub-alternative 3.3, the combined cap would be 49% for surfclams and 49% for ocean quahogs. This cap is similar to the tilefish IFQ cap which allows for a 49% maximum share cap value for a tilefish combined cap (i.e., ownership plus leasing). A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities and one small entity, at 49%, 49%, and 2%; Table 19).

If the surfclam and ocean quahog combined 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office;

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 (Table 19).

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 landings or 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 share consolidation and associated market power issues. In addition, since this alternative would implement a combined 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 would be a level of quota control that results 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.

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 where compared to current conditions.

Sub-alternative 3.1 would have no socioeconomic impacts in the short-term compared to sub-alternatives 3.2 and 3.3. In the long-term, alternative 3.1 would have no 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 of 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. 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.

Sub-alternative 3.2 would have slight positive socioeconomic impacts in the long-term compared to sub-alternatives 3.3, as sub-alternative 3.2 has the potential to provide a larger degree of protection against excessive consolidation.

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.

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.

Under Alternative 4, a two-part cap approach would be implemented for each surfclams and ocean quahogs, with a cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags). 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 combined quota share ownership plus leasing, 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 leasing of annual allocation (cage tags), it accounts for transactions and complex business practices that occur in these fisheries.

Under sub-alternative 4.1, the two-part cap approach which includes one cap on allocation ownership and one combined cap (allocation ownership plus leasing of annual allocation or cage tags) would be based on the highest levels reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) the 2016-2017 period. The species-specific cap levels do not have to be the same for surfclam and ocean quahogs. 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). Specific maximum values for various models and level of analysis (e.g., 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% ownership / 28% combined under the net actual percentage model (at the individual/business level) or as high as 28% ownership / 49% combined under the cumulative 100% model (at the corporate officer level; Tables 2 and 20). Based on these combined cap values, sub-alternative 4.1 could result in a minimum number of five large entities 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 quahogs could be as low as 22% ownership / 29% combined under the net actual percentage model (at the individual/business level) or as high as 22% ownership / 41% combined under the cumulative 100% model (at the corporate officer level; Tables 3 and 20). For ocean quahogs, this sub-alternative could result in a minimum number of five large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 landings or 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 share consolidation and associated market power issues.

In addition, since this 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 would be a level of quota control that results 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.

Under sub-alternative 4.2, the two-part cap approach would be based on values reported in the ownership data for each fishery (i.e., surfclams and ocean quahogs) 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 data for the 2016-2017 period to allow for additional consolidation (Table 20). The 15% value to allow for additional consolidation 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 do not have to be the same for surfclam and ocean quahogs. 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). Specific maximum values for various models and level of analysis (e.g., 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% ownership / 43% combined under the net actual percentage model (at the individual/business level) or as high as 43% ownership / 64% combined under the cumulative 100% model (at the corporate officer level; Table 20). Based on these combined cap values, sub-alternative 4.1 could result in a minimum number of five large entities 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 quahogs could be as low as 37% ownership / 44% combined under the net actual percentage model (at the individual/business level) or as high as 37% ownership / 56% combined under the cumulative 100% model (at the corporate officer level; Table 20). For ocean quahogs, this sub-alternative could result in a minimum number of five large entities 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 4.2 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 landings or 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 share consolidation and associated market power issues. In addition, since this 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 would be a level of quota control that results 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.

Under sub-alternative 4.3, the ownership quota share cap would be 30% and the combined cap (quota share ownership plus leasing of annual allocation or cage tags) would be 60%. These values are 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 multiseason basis." A 30% ownership cap and a 60% combined cap (quota share ownership plus leasing of annual allocation or cage tags) 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 (i.e., 30%/60%) had been implemented in 2017, all entities would have fallen below those quota share caps regardless of ownership percentage model (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 (Table 20).

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 landings or 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 share consolidation and associated market power issues. In addition, since this 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 would be a level of quota control that results 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.

Comparisons Across Sub-Alternatives 4.1 to 4.3

In this section a comparison between sub-alternatives 4.1 through 4.3 is made. This is different from the previous section where each of these sub-alternatives where compared to current conditions.

In general terms, sub-alternatives 4.1, 4.2, and 4.3 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 of four large entities) participating in these fisheries (Table 20). As such, they all have the potential to provide a relatively similar degree of protection against excessive consolidation.

Under Alternatives 5, a cap on quota share ownership-only of 40% for surfclams and 40% for ocean quahogs with unlimited leasing of annual allocation (cage tags) 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 recommendations found in the Compass Lexecon Report and corresponding CIE review (Mitchell et al. 2011, 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 surfclams or quahogs midway through the fishing year. A 40% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., three large entities at 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 use/exhausted.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without Government 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.

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 landings or ex-vessel revenues are expected when compared to current conditions. However, 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, as it provides protection against excessive share consolidation and associated market power issues. 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, 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. 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. Lastly, while not likely, 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 surfclams or quahogs 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.

Under Alternatives 6, a cap on quota share ownership-only of 49% for surfclams and 49% for ocean quahogs with unlimited leasing of annual allocation (cage tags) 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 tilefish IFQ cap which allows for a 49% maximum share cap value; however, in tilefish it is applied to ownership and leasing combined. 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). A 49% cap could potentially result in a minimum of three entities participating in the fisheries (i.e., two large entities 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). 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 (e.g., net actual percentage or cumulative 100% model) or affiliation level (e.g., individual/business, family, or corporate office; 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 use/exhausted.

Since the cap under this alternative is based on ownership-only, it does not account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) that are prevalent in the fisheries when setting the cap limit. This alternative allows leasing to continue and does not impose a limit on leasing. Essentially, the leasing market would be allowed to proceed without Government 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.

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 landings or ex-vessel revenues are expected when compared to current conditions. However, 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, as it provides protection against excessive share consolidation and associated market power issues. 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, 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. 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. Lastly, while not likely, 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 surfclams or quahogs 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 Alternatives

In general terms, alternatives 5 and 6 would result in the largest positive impacts, 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.

Alternative 1 (No Action)

As previously indicated, under alternative 1 (no action) no limit 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. 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).[44]

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 landings or ex-vessel revenues are expected when compared to current conditions.

Alternative 2

[44] 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).

Alternative 2 would implement a single cap based on quota share ownership-only with unlimited leasing of annual allocations (cage tags). Because alternative 2 is based on ownership-only values, it does not account for leasing or other transactions and complex business practices (e.g., combined ownership plus leasing) 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 surfclams and ocean quahogs, 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 share 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, 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 surfclams and ocean quahogs 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.

Alternative 3

Alternative 3 would implement a combined cap based on quota share ownership plus leasing of annual allocation (cage tags). Because alternative 3 is based on combined ownership plus leasing of annual allocation (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 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 share 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, 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 surfclams and ocean quahogs 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.

Alternative 4

Alternative 4 would implement a two-part cap approach, with a cap on quota share ownership and a cap on combined quota share ownership plus leasing of annual allocation (cage tags). Because alternative 4 is based on a two-part cap approach that limits combined quota share ownership plus leasing, 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 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 share 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, 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 surfclams and ocean quahogs 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.

Alternative 5

Alternative 5 would implement a cap on quota share ownership-only with unlimited leasing of annual allocation (cage tags). 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 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 surfclams and ocean quahogs 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. For these same reasons,

alternative 4 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 5, 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 surfclams and ocean quahogs 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.

Alternative 6

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

Comparison of Excessive Shares Review Alternatives

Under alternative 1 (no action), 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. Therefore, 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 will likely change in the future. Therefore, an excessive shares measure established at an appropriate level 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 any 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 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 any 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 will 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 costs 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.

Comparisons of Framework Adjustment Process Alternatives

Under alternative 1 (no action), 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* measures that can be added or modified via the framework adjustment process). This alternative would not allow the excessive shares cap 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 typically requires more work and time compared to a framework process. Not having the flexibility to make minor modifications to the excessive share 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 share cap level to the list of frameworkable actions in the FMP. This frameworkable item would provide means to make modifications to the 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 select 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.

Comparisons of Multi-Year Management Measures Alternatives

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. 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 is administrative in nature as this action deals entirely with the periodicity by which the annual management measures are specified. Alternative 2 would allow for specifications to be set for a maximum number of years 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.

7.5 Cumulative Effects Analysis

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ; 40 CFR §1508.7). The purpose of CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective. Rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required under NEPA as part of an EA if the significance of cumulative impacts have been considered (U.S. EPA 1999). The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed surfclams and ocean quahog fisheries.

7.5.1 Consideration of the VECs

The following sections discuss the significance of the cumulative effects on the following VECs:

- Managed resource (Atlantic surfclam and ocean quahog) and non-target species
- Physical environment
- Protected species
- Human communities

7.5.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of Atlantic 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 (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 the managed species (section 6.4).

7.5.3 Temporal Boundaries

The temporal scope of past and present actions for VECs is primarily focused on actions that have occurred after FMP implementation (1977 for surfclam and ocean quahog). For endangered and other protected resources, the scope of past and present actions is on a species-by-species basis (section 6.3) and is largely focused on the 1980s and 1990s through the present, when NOAA Fisheries began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all five VECs extends about three years (2022) into the future. This period was chosen because the dynamic nature of resource management and lack of information on projects that may occur in the future make it very difficult to predict impacts beyond this timeframe with any certainty.

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. Table 22 presents meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions other than those considered in this document. The impacts of these actions are described qualitatively as the actual impacts are too complex to be quantified in a meaningful way. When any of these abbreviations (P, Pr, or RFF), occur together it indicates that some past actions are still relevant to the present and/or future actions.

Fishery Management Actions

Surfclam and Ocean Quahog FMP Actions

Past, present, and reasonably foreseeable future actions for surfclam and ocean quahogs management include the establishment of the original FMPs, all subsequent amendments and frameworks, and the setting of annual specifications (annual catch limits and measures to constrain catch and harvest). These fisheries are managed under an ITQ system, and recently, the NMFS implemented a data collection protocol process to collect information about quota share ownership that would enhance the management of these fisheries. The historical management practices of the Council have resulted in overall positive impacts on the health of the surfclam and ocean quahog stocks (section 7.5.5.1). The Council has taken many actions to manage the associated commercial fisheries. The MSA is the statutory basis for federal fisheries management. To the degree with which this regulatory regime is complied, 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, in the long-term, promote positive effects on human communities.

Other FMP Actions

In addition to the Atlantic Surfclam and Ocean Quahog FMP, there are many other FMPs and associated fishery management actions for other species that have impacted these VECs over the temporal scale described in section 7.3.3. 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.

As with the surfclam and ocean quahog actions described above, other FMP actions developed by Fishery Management Councils or GARFO have been developed in compliance with the MSA and have had positive long-term cumulative impacts on managed and non-target species, habitat, and protected resources because they constrain fishing effort and manage stocks at sustainable levels. However, 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, in the long-term, promote positive effects on human communities.

Non-Fishing Impacts

Other Human Activities

Non-fishing activities that introduce chemical pollutants, sewage, or suspended sediment into the marine environment or result in changes in water temperature, salinity, or dissolved oxygen, pose a risk to all VECs. Human-induced non-fishing activities tend to be localized in nearshore areas and marine project areas where they occur. Examples of these activities include agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging, and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the sustainability 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. Mitigation of this outcome through regulations that reduce fishing effort could negatively impact human communities. The overall impact on the affected species and their habitats on a population level is unknown, but likely to range from no impact to low negative, depending on the population, since a large portion of these populations have a limited or minor exposure to these local non-fishing perturbations.

Non-fishing activities permitted under other Federal agencies (e.g. beach nourishment, offshore wind facilities, etc.) 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). 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 and by commenting on actions likely to substantially affect habitat.

In addition to the activities above, in recent years, offshore wind energy and oil and gas exploration have become more relevant activities in the Greater Atlantic region that are expected to impact all VECs, as described below. For potential biological impacts of wind, the turbines and cables may influence water currents and electromagnetic fields, respectively, which can affect patterns of movement for various species (target, non-target, protected). Habitats directly at the turbine and cable sites would be affected, and there could be scouring concerns around turbines. Impacts on human communities in a general sense will be mixed – there will be economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable sources. But there may be negative effects on fishing activities in terms of effort displacement, or making fishing more difficult or expensive near the turbines or cables.

For oil and gas, this timeframe would include leasing and possible surveys. Seismic surveys impact the acoustic environment within which marine species live, and have uncertain effects on fish behaviors that could cumulatively lead to negative population level impacts. The science on this

is fairly uncertain. If marine resources are affected by seismic, then so in turn the fishermen targeting these resources would be affected. However, there would be an economic component in the form of increased jobs where there may be some positive effects on human communities.

While there are currently no operational wind farms in Mid-Atlantic waters, potential offshore wind energy sites have been identified off of Virginia, Maryland, New Jersey, Delaware, and New York, and there are several proposals to develop wind farms in both nearshore and offshore waters. In New England, offshore wind project construction south of Massachusetts/Rhode Island may begin as early as 2019 (three projects including Vineyard Wind, Bay State Wind, and South Fork Wind Farm). Additional areas have been leased and will have site assessment activities in the next few years. These projects could have low negative impacts on EFH, as well as surfclam and ocean quahog, non-target species, and fishing communities if there are any negative impacts on those resources. Furthermore, there could be negative impacts on protected species of birds and marine mammals if they interact with the wind farms.

The overall impact of offshore wind energy and oil and gas exploration on the affected species and their habitats on a population level is unknown, but likely to range from no impact to moderate negative, depending on the number and locations of projects that occur, as well as the effects of mitigation efforts.

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. 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). Climate change will potentially exacerbate the stresses imposed by fishing and other non-fishing human activities and stressors.

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).[45] Based on this assessment, surfclam was determined to 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

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

temperatures. Surfclam was determined to have a “high” biological sensitivity to climate change as they form calcium carbonate shell and adults are sessile.

This assessment determined 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 quahogs 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).

Overall, climate change is expected to have impacts that range from positive to negative depending on the species. For surfclams and ocean quahogs climate change impacts are high. However, future mitigation and adaptation strategies to climate change may mitigate some of these impacts. The science of predicting, evaluating, monitoring and categorizing these changes continues to evolve.

Table 22. Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this Amendment document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr **Original Surfclam and Ocean Quahog FMP and subsequent FMP Amendments and Frameworks**	Established management measures	**Indirect Positive** Regulatory tool available to rebuild and manage stocks	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses
P, Pr **Surfclam and Ocean Quahog Specifications**	Establish quotas, other fishery regulations	**Indirect Positive** Regulatory tool to specify catch limits, and other regulation; allows response to annual stock updates	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Benefited domestic businesses
P, Pr, RFF **Developed, Applied, and Redo of Standardized Bycatch Reporting Methodology**	Established acceptable level of precision and accuracy for monitoring of bycatch in fisheries	**No Impact** May improve data quality for monitoring total removals of managed resource	**No Impact** May improve data quality for monitoring removals of non-target species	**No Impact** Will not affect distribution of effort	**No Impact** May increase observer coverage and will not affect distribution of effort	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
P, Pr, RFF **Other FMPs and Omnibus Actions**	Regulating fishing effort in other FMPs, habitat and forage species protection, industry monitoring and reporting	**Direct and Indirect Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Direct and Indirect Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Indirect Positive** Reduced fishing effort, implemented gear requirements	**Indirect Positive** Regulated fishing effort, implemented gear requirements	**Mixed** Benefited some domestic businesses; negative impacts on some participants due to limited access and constraints on landings and revenues
P, Pr, RFF **PSP Closed Areas**	Reopening of PSP Closed Areas to Clam fishing	**No Impact to Indirect Negative** Fishery impacts in previously unfished areas	**Indirect Positive** Reduced overall fishing effort	**Indirect Positive** Reduced overall fishing effort	**No Impact** Limited interactions with gear occur	**Indirect Positive** Benefitted domestic businesses

Table 22 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this Amendment document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFF **Agricultural runoff**	Nutrients applied to agricultural land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource
P, Pr, RFF **Climate change**	Wide-ranging impacts including changes in ocean chemistry, temperatures, sea-level, and ocean circulation; increased frequency, intensity, and duration of extreme climate events.	**Negative to positive** Some species will benefit, others will see negative impacts, depending on the adaptability of each species to the changing environment	**Negative to positive** Some species will benefit, others will see negative impacts, depending on the adaptability of each species to the changing environment	**Negative to positive** Decreased habitat quality, suitability and/or availability for some species; increased quality/suitability/availability for others	**Negative to positive** Depending on impacts to habitat and prey availability	**Negative to positive** Depending on resiliency of individual communities and mitigation/adaptation
P, Pr, RFF **Port maintenance**	Dredging of coastal, port and harbor areas for port maintenance	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
P, Pr, RFF **Offshore disposal of dredged materials**	Disposal of dredged materials	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource viability
P, Pr, RFF **Beach nourishment**	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for mining companies, possibly negative for fishing industry
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Positive** Beachgoers like sand; positive for tourism

Table 22 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this Amendment document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFF **Marine transportation**	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFF **Renewable and Non-renewable Offshore and Nearshore Energy Development**	Transportation of oil, gas, and electric through pipelines and cables; Construction of oil platforms, wind facilities, liquefied natural gas facilities; Additional port development infrastructure	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Reduced habitat quality; offshore platforms may benefit structure oriented fish species habitat	**Potentially Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
Pr, RFF **Implementation of Data Collection Protocol**	Collect data needed to track ITQ share ownership within the fishery	**No Impact** Administrative - no direct or indirect impacts	**No Impact** Administrative - no direct or indirect impacts	**No Impact** Administrative - no direct or indirect impacts	**No Impact** Administrative - no direct or indirect impacts	**Uncertain – Likely Mixed** Collects data needed to evaluate excessive shares cap, but additional paperwork may be required
RFF **Amendment to address Excessive Shares (within 3 years)**	Establish a cap for excessive share accumulation	**No Impact** Administrative - no direct or indirect impacts	**No Impact** Administrative - no direct or indirect impacts	**No Impact** Administrative - no direct or indirect impacts	**No Impact** Administrative - no direct or indirect impacts	**Indirect Positive** Protects against excessive share accumulation in fishery

Table 22 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this Amendment document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
RFF Omnibus EFH Amendment 2 (NEFMC) and Clam Access Frameworks	Revises essential fish habitat and habitat area of particular concern designations, revises or creates habitat management areas, including gear restrictions	**Indirect Positive** Improve habitat quality	**Indirect Positive** Improve habitat quality	**Indirect Positive** Improve habitat quality	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues
RFF Convening of Take Reduction Teams (periodically)	Recommend measures to reduce mortality and injury to marine mammals	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues

7.5.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and future actions, must be taken into account. The following section describes the expected effects of these actions on each VEC.

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

Those past, present, and reasonably foreseeable future actions which may impact target species (surfclam and ocean quahog) and non-target species, and the direction of those potential impacts, are summarized in Table 22. The indirectly negative actions described in Table 22 are localized in nearshore and marine areas where the projects occur; therefore, the magnitude of those impacts on the managed resources is expected to be limited due to limited exposure to the populations at large. Agricultural runoff may be much broader in scope and the impacts of nutrient inputs to the coastal system may be larger in magnitude; however, the impact on productivity of the managed resources is not quantifiable.

NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Past fishery management actions taken through the respective FMPs and the annual specifications process have had a positive cumulative effect on the managed resources. It is anticipated that the future management actions described in Table 22 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 the productivity of managed species depends. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to the managed resources have had positive cumulative effects.

Catch limits, commercial quotas and recreational harvest limits for each of the managed species have been specified to ensure that these rebuilt stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from specification of management measures are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures are effective. The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on the managed resources by achieving the objectives specified in the respective FMP and ensuring the requirements of the MSA are met. Therefore, the proposed action would not have any significant effect on the managed resources individually or in conjunction with other anthropogenic activities (Table 22).

7.5.5.2 Magnitude and Significance of Cumulative Effects on Physical Environment

Those past, present, and reasonably foreseeable future actions which may impact the physical environment and habitat (including EFH), and the direction of those potential impacts, are summarized in Table 22. The direct and indirect negative actions described in Table 22 are localized in nearshore and marine project areas where they occur. Therefore, the magnitude of those impacts on habitat is expected to be limited due to limited exposure of habitat at large. Agricultural runoff may be much broader in scope and the impacts of nutrient inputs to the coastal system may be larger in magnitude; however, the impact on habitat is not quantifiable.

NMFS has several means under which it can review non-fishing actions of other Federal or state agencies that may impact NMFS' managed resources and the habitat on which they rely prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of direct and indirect negative impacts those actions could have on habitat utilized by species under NMFS' jurisdiction.

Past fishery management actions taken through the respective FMPs and annual specifications process have had positive cumulative effects on habitat. The actions have constrained fishing effort both at a large scale and locally and have implemented gear requirements which may reduce impacts on habitat. As required under these FMP actions, EFH and Habitat Areas of Particular Concern were designated for the managed resources. It is anticipated that the future management actions described in Table 22 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. These impacts could be broad in scope. All the VECs are interrelated; therefore, the linkages among habitat quality, managed resources and non-target species productivity, and associated fishery yields should be considered. 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 indirectly impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to habitat have had neutral to positive cumulative effects.

The proposed actions described in this document are largely administrative in nature and would not significantly change the past and anticipated cumulative effects on habitat and thus would not have any significant effect on habitat individually or in conjunction with other anthropogenic activities (Table 22).

7.5.5.3 Magnitude and Significance of Cumulative Effects on Protected Species

Those past, present, and reasonably foreseeable future actions which may impact protected species, and the direction of those impacts, are summarized in Table 22. The indirectly negative actions described in Table 22 are localized in nearshore and marine project areas where they occur. Therefore, the magnitude of those impacts on protected species is expected to be limited due to limited exposure of the populations at large. Agricultural runoff may be much broader in scope

and the impacts of nutrient inputs to the coastal system may be larger in magnitude; however, the impact on protected species is not quantifiable.

NMFS has several means under which it can review non-fishing actions of other Federal or state agencies that may impact protected species prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on protected species under NMFS' jurisdiction.

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 1970's through the present). While some protected species are doing better than others, overall the trend of stock condition for protected resources has improved over the long-term due to reductions in the number of interactions. Past fishery management actions taken through the respective FMPs and annual specifications process have contributed to this long-term trend toward positive cumulative effect on protected species through the reduction of fishing effort (and thus reduction in potential interactions) and implementation of gear requirements. It is anticipated that future management actions, described in Table 22, will result in additional indirect positive effects on protected species. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected species have had a positive cumulative effect.

The proposed actions described in this document are largely administrative in nature and would not change the past and anticipated cumulative effects on protected species and thus would not have any significant effect on protected species individually or in conjunction with other anthropogenic activities (Table 22). Overall, actions have had, or will have, positive impacts on protected species.

7.5.5.4 Magnitude and Significance of Cumulative Effects on Human Communities

Those past, present, and reasonably foreseeable future actions which may impact human communities and the direction of those potential impacts are summarized in Table 22. The indirectly negative actions described in Table 22 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on human communities is expected to be limited in scope. Those actions may displace fishermen from project areas. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal ecosystem may larger in magnitude. This may result in indirect negative impacts on human communities by reducing resource availability; however, this effect is not quantifiable.

NMFS has several means under which it can review non-fishing actions of other Federal or state agencies prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on human communities.

Past fishery management actions taken through the respective FMPs and annual specifications process have had both positive and negative cumulative effects by benefiting domestic fisheries through sustainable fishery management practices while also sometimes reducing the availability

of the resource to fishery participants. 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 Table 22 will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on the human communities could occur if management actions result in reduced revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects.

Catch limits and commercial quotas for each of the managed species have been specified to ensure that these rebuilt stocks are managed in a sustainable manner and that management measures are consistent with the objectives of the FMPs under the guidance of the MSA. The impacts from annual specification of management measures on the managed species are largely dependent on how effective those measures are in meeting their intended objectives and the extent to which mitigating measures are effective.

Despite the potential for negative short-term effects on human communities, positive long-term effects are expected due to the long-term sustainability of the managed stocks. Overall, the proposed actions described in this document would not change the past and anticipated cumulative effects on human communities and thus, would not have any significant effect on human communities individually, or in conjunction with other anthropogenic activities (Table 22).

7.5.6 Preferred Action on all the VECs

[This section will be completed prior to submission to the NMFS]

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 most recent FMP amendments describe how the management actions implemented comply with the 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 Atlantic surfclam and ocean quahogs and the U.S. fishing industry.

To achieve OY, both scientific and management uncertainty need to be addressed when establishing catch limits that are less than the Overfishing Limit (OFL); therefore, the Council develops recommendations that do not exceed the ABC recommendations of the SSC which have been developed to explicitly address scientific uncertainty. In addition, the Council has considered relevant sources of management uncertainty and other social, economic, and ecological factors, which resulted in recommendations for annual catch targets for both managed resources. The Council uses the best scientific information available (National Standard 2) and manages both species throughout their range (National Standard 3). These management measures do not discriminate among residents of different states (National Standard 4), they do not have economic allocation as their sole purpose (National Standard 5), the measures account for variations in these fisheries (National Standard 6), they 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). Finally, actions taken are consistent with National Standard 9, which addresses bycatch in fisheries. The Council has implemented many regulations that have indirectly acted to reduce 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 ports and communities that depend on these fisheries, the Nation as a whole, and certainly for the resources.

8.2 NEPA FINDING OF NO SIGNIFICANT IMPACT (FONSI)

[This section will be completed prior to submission to the NMFS]

The CEQ 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 CEQ 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?

2. Can the proposed action reasonably be expected to significantly affect 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?

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

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?

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

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?

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?

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

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

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

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

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

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

DETERMINATION

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

_____ _____

Regional Administrator for GARFO, NMFS, NOAA *Date*

8.3 Endangered Species Act

Sections 6.3 and 7.0 should be referenced for an assessment of the impacts of the proposed action on ESA-listed 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 7.0 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 or critical habitat in any manner not considered in previous consultations on the fisheries. A final determination of consistency with MMPA will be made by the agency during the rulemaking process.

8.5 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council has developed this amendment document 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 document 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. The public had the opportunity to review and comment on management measures during the Council meeting in June 2018. FMAT meetings were also open to the public. Public hearings will be held and provide addition opportunity for comment from the public, prior to the Council's decision to submit the document to NOAA Fisheries. In addition, the public will have further opportunity to comment on this amendment document when NOAA Fisheries 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 for setting measures to ensure that no individual, corporation, or other entity acquires an excessive share of the Atlantic surfclam and ocean quahog ITQ privileges. This action would also revise the process for specifying multi-year management measures, require periodic review of the excessive share cap level, and allow adjustments to the made under the frameworkable provisions of the FMP. In addition, this amendment may also consider revisions to some or all of the current 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 document was developed to be consistent with the FMP, MSA, and other applicable laws, through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on management measures during a number of public meetings (see section 8.6). In addition, the public will have further opportunity to comment on this amendment document 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 the following types of documents: Other/Discussion (e.g., Confidentiality of Statistics of the MSA; NOAA Administrative Order

216-100, Protection of Confidential Fisheries Statistics; 50 CFR §229.11, Confidentiality of information collected under the 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 with any of the applicable National Standards. The analyses used to develop the alternatives (i.e., policy choices) are based upon the best scientific information available. The most up to date information was used to develop the EA which evaluates the impacts of those alternatives (see section 7.0). The specialists who worked with these core data sets and population assessment models are familiar with the most recent analytical techniques and are familiar with the available data and information relevant to the surfclam and ocean quahog fisheries.

The review process for this amendment document involves MAFMC, NEFSC, GARFO, and NMFS headquarters. The NEFSC technical review is conducted by senior level scientists with specialties in fisheries ecology, population dynamics and biology, as well as economics and non-economic social sciences. The MAFMC review process involves public meetings at which affected stakeholders have the opportunity to comments on proposed management measures. Review by GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected resources, and compliance with the applicable laws. Final approval of the amendment document 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 Regulatory Impact Review / Initial Regulatory Flexibility Analysis

[This section will be completed prior to submission to the NMFS].

However, during the public hearings for the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment, we are seeking industry and public input in categorizing current allocation holders by matching allocation holders using the industries described in the North American

Industry Classification System Codes (NAICS) for the purpose of conduction the Regulatory Flexibility Analysis (RFA).

The NAICS codes are used to categorize businesses by industry description (e.g., commercial harvester, processor, bank, for-hire vessel). As an example, the 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. A small business in the recreational for-hire fishery is a firm with receipts of up to $7.5 million.

The FMAT used the Small Business Administration table of Small Business Size Standards matched to the NAICS Codes to categorize current surfclam and ocean quahog allocations holders (See Tables X and Y below) and seeks industry and public input on the categorizations made or any missing information. This data will be used when finalizing the analysis in this section once the Council selects the prefer alternative.

The NOAA Fisheries requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions that either implement a new FMP or significantly amend an existing plan. This RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. This analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of this analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. This RIR addresses many items in the regulatory philosophy and principles of EO 12866.

The Regulatory Flexibility Act (RFA) requires the Federal rulemaker to examine the impacts of proposed and existing rules on small businesses, small organizations, and small governmental jurisdictions. In reviewing the potential impacts of proposed regulations, the agency must either certify that the rule "will not, if promulgated, have a significant economic impact on a substantial number of small entities." As indicated in section 5.0, the proposed actions in this document would implement measures to ensure that no individual, corporation, or other entity acquires an excessive share of the Atlantic surfclam and ocean quahog ITQ privileges, measures that facilitate for the periodic review of any implemented excessive cap level, measures that facilitate revisions to the process for specifying multi-year management measures, and measures that allow modifications to the excessive shares cap level via framework actions. An Initial Regulatory Flexibility Analysis (IRFA) will be prepared to further evaluate the economic impacts of the various alternatives presented once the Council has identified preferred alternatives. This analysis supports a more thorough analysis (RFA Analysis) which will be completed.

Table X. SBA classification for 2017 ocean quahog allocation owners of record.

SBA Code	Size Standard in Millions	SBA Classification	Alloc. #	Owner of Record	Street	City	State
424460	100 employees	Fish and Seafood Merchant Wholesalers	Q667	Bumble Bee Foods LLC c/o Gabriel Montesano	280 10th Ave	San Diego	CA
424460	100 employees	Fish and Seafood Merchant Wholesalers	Q649	Singer Island Ventures Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL
522110	$550 million in assets	Commercial Banking	Q664	TD Bank NA Attn: David Nilsen, Sr. Vice President	1101 Hooper Ave	Toms River	NJ
522110	$550 million in assets	Commercial Banking	Q691	Tristate Capital Bank Attn: Loan Operations	301 Grant St Ste 2700	Pittsburgh	PA
522130	$550 million in assets	Credit Unions	Q690	Farm Credit East, ACA ITF Surfside Clam Resources LLC	29 Landis Ave	Bridgeton	NJ
?	?	?	Q684	ITQ LLC	PO Box 727	Manahawkin	NJ
?	?	?	Q199	Legend Inc	607 Seashore Rd	Cape May	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	Q112	Wando River Corporation c/o Blount Fine Foods Corporation	630 Currant Rd	Fall River	MA
114113	$11 million in revenues	Commercial fishing	Q194	John Kelleher C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ
114113	$11 million in revenues	Commercial fishing	Q021	Atlantic Vessels of Delaware Inc	PO Box 178	Norfolk	VA

114113	$11 million in revenues	Commercial fishing	Q055	Kristy Lee Clam Co	PO Box 114	Newcomb	NY
114113	$11 million in revenues	Commercial fishing	Q629	LET Ventures Incorporated (Ellen W LLC)	PO Box 727	Manahawkin	NJ
114113?	$11 million in revenues?	Commercial fishing?	Q006	Thomas E McNulty Sr	118 Springers Mill Rd	Cape May Court House	NJ
114113	$11 million in revenues	Commercial fishing	Q576	Foxy Investments Inc C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ
523991	$38.5 million in revenues	Trust, Fiduciary and Custody Activities	Q609	M J Holding Co LLC	PO Box 114	Newcomb	NY
114113	$11 million in revenues	Commercial fishing	Q596	Atlantic Vessels Inc	PO Box 178	Norfolk	VA
114113	$11 million in revenues	Commercial fishing	Q115	LET Ventures Incorporated (Patti B Clam Ventures Inc)	PO Box 727	Manahawkin	NJ
114113?	$11 million in revenues?	Commercial fishing?	Q181	Thomas E McNulty Sr	118 Springers Mill Rd	Cape May Court House	NJ
?	?	?	Q672	OSM Resources LLC	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	Q598	John W Kelleher Trust C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ
?	?	?	Q676	International Clam Management Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL

114113	$11 million in revenues	Commercial fishing	Q005	LET Ventures Incorporated (A & B Commercial Fish Inc)	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	Q049	LET Ventures Incorporated (Sarah C Conway Inc)	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	Q128	LET Ventures Incorporated (F/V Ocean View Inc)	PO Box 727	Manahawkin	NJ
114113?	$11 million in revenues?	Commercial fishing?	Q109	Woodrow Laurence Inc	12310 Collins Rd	Bishopville	MD
114113	$11 million in revenues	Commercial fishing	Q101	T & M Clammers Inc	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	Q193	Peter A LaMonica C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ
?	?	?	Q107	Anthony E and John D Martin	11014 Grays Corner Rd	Berlin	MD
424460	100 employees	Fish and Seafood Merchant Wholesalers	Q174	Leroy E and Dolores Truex	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	Q084	LET Ventures Incorporated (B&B Shellfishing Inc)	PO Box 727	Manahawkin	NJ
?	?	?	Q685	NSR Resources LLC	PO Box 727	Manahawkin	NJ
523991	$38.5 million in revenues	Trust, Fiduciary and Custody Activities	Q016	George S Carmines In Trust	103 Rens Rd	Poquoson	VA
?	?	?	Q003	Adriatic Inc	10127 Keyser Point Road	Ocean City	MD

?	?	?	Q669	Kenneth W Bailey	PO Box 12	Heislerville	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	Q658	DC Air & Seafood Inc	PO Box 581	Winter Harbor	ME
?	?	?	Q056	Seafish Inc	10134 Waterview Dr	Ocean City	MD
114113	$11 million in revenues	Commercial fishing	Q143	Shellfish Inc	PO Box 86	West Sayville	NY

Table Y. SBA classification for 2017 surfclam allocation owners of record.

SBA Code	Size Standard in Millions	SBA Classification	Alloc. #	Owner of Record	Street	City	State
?	?	?	C624	International Clam Management Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL
424460	100 employees	Fish and Seafood Merchant Wholesalers	C583	Singer Island Ventures Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL
522110	$550 million in assets	Commercial Banking	C632	Tristate Capital Bank Attn: Loan Operations	301 Grant St Ste 2700	Pittsburgh	PA
522130	$550 million in assets	Credit Unions	C529	Farm Credit East, ACA Attn: Benjamin Thompson	240 South Rd	Enfield	CT
NA	Public Administration: Small business size standards are not established for this Sector. Establishments in the Public Administration Sector are Federal, state, and local government agencies which administer	Sector 92	C669	US DOC NOAA/NMFS Financial Services Division	55 Great Republic Dr	Gloucester	MA
NA		Sector 92	C666	US DOC NOAA/NMFS Financial Services Division ITF Michael and Danny NOAA ITQs	55 Great Republic Dr	Gloucester	MA

	and oversee government programs and activities that are not performed by private establishments.			Attn: James Plouffe			
?	?	?	C136	Stephanie Dee Inc	4371 Northlake Blvd # 369	Palm Beach Gardens	FL
522110	$550 million in assets	Commercial Banking	C660	First Niagara Bank NA ITF DPL Niagara Enterprises LLC Attn: Terri Kratz	401 Plymouth Rd Ste 600	Plymouth Meeting	PA
114113?	$11 million in revenues?	Commercial fishing?	C009	Thomas E McNulty Sr	118 Springers Mill Rd	Cape May Court House	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C188	Blount Fine Foods Corporation	630 Currant Rd	Fall River	MA
522110	$550 million in assets	Commercial Banking	C634	Tristate Capital Bank Attn: Loan Operations	301 Grant St Ste 2700	Pittsburgh	PA
114113	$11 million in revenues	Commercial fishing	C074	Kristy Lee Clam Co	PO Box 114	Newcomb	NY
522130	$550 million in assets	Credit Unions	C546	Farm Credit East, ACA FBO JM & MT Attn: Benjamin Thompson	240 South Rd	Enfield	CT
114113	$11 million in revenues	Commercial fishing	C589	Yannis Karavia LLC C/O 20 Fathom LLC	PO Box 600	Dorchester	NJ
522130	$550 million in assets	Credit Unions	C627	Farm Credit East, ACA Attn: Scott Kenney	240 South Rd	Enfield	CT
424460	100 employees	Fish and Seafood Merchant Wholesalers	C540	George Torggler	921 Preserve Dr	Annapolis	MD
522130	$550 million in assets	Credit Unions	C662	Farm Credit East, ACA ITF Surfside Clam Resources LLC	29 Landis Ave	Bridgeton	NJ

424460	100 employees	Fish and Seafood Merchant Wholesalers	C663	DPL ITQs LLC	PO Box 309	Millville	NJ
114113	$11 million in revenues	Commercial fishing	C528	LNA Inc	PO Box 178	Portsmouth	RI
114113?	$11 million in revenues?	Commercial fishing?	C146	Woodrow Laurence Inc	12310 Collins Rd	Bishopville	MD
523991	$38.5 million in revenues	Trust, Fiduciary and Custody Activities	C026	George S Carmines In Trust	103 Rens Rd	Poquoson	VA
522130	$550 million in assets	Credit Unions	C547	Farm Credit East, ACA FBO LET Attn: Benjamin Thompson	240 South Rd	Enfield	CT
?	?	?	C004	Adriatic Inc	10127 Keyser Point Road	Ocean City	MD
114113	$11 million in revenues	Commercial fishing	C642	CCCFA Inc Attn: Seth Rolbein	1566 Main St	Chatham	MA
114113	$11 million in revenues	Commercial fishing	C563	LET Ventures Incorporated (Ellen W LLC)	PO Box 727	Manahawkin	NJ
NA	Public Administration: Small business size standards are not established for this Sector. Establishments in the Public Administration Sector are Federal, state, and local government agencies which administer and oversee government programs and activities that are not performed by private establishments.	Sector 92	C674	US DOC NOAA/NMFS Financial Services Division ITF LaVecchia and LaVecchia LLC Attn: James Plouffe	55 Great Republic Dr	Gloucester	MA
114113	$11 million in revenues	Commercial fishing	C110	LET Ventures Incorporated (F/V Ocean Bird Inc)	PO Box 727	Manahawkin	NJ

?	?	?	C133	City of Southport Inc	854 Tern Ln Apt 103	Salisbury	MD
523991	$38.5 million in revenues	Trust, Fiduciary and Custody Activities	C552	M J Holding Co LLC	PO Box 114	Newcomb	NY
?	?	?	C664	Faye Y Watson	10222 Golf Course Rd	Ocean City	MD
114113	$11 million in revenues	Commercial fishing	C065	LET Ventures Incorporated (Sarah C Conway Inc)	PO Box 727	Manahawkin	NJ
?	?	?	C166	Nantucket Shoals Inc Attn: Albert C Rosinha Jr	147 Pine St	Rochester	MA
522110	$550 million in assets	Commercial Banking	C559	Sturdy Savings Bank (P & E) Attn: Commercial Loans	PO Box 900	Cape May Court House	NJ
522110	$550 million in assets	Commercial Banking	C655	Audubon Savings Bank ITF Cape Cod of Maryland Inc Attn: Letitia C. Baum, Senior Vice President	515 S White Horse Pike	Audubon	NJ
114113	$11 million in revenues	Commercial fishing	C007	LET Ventures Incorporated (A & B Commercial Fish Inc)	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	C046	LET Ventures Incorporated (B & D Commercial Fish Inc)	PO Box 727	Manahawkin	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C215	Leroy E and Dolores Truex	PO Box 727	Manahawkin	NJ
?	?	?	C189	Anthony W Watson	10232 Golf Course Rd	Ocean City	MD
114113	$11 million in revenues	Commercial fishing	C151	LET Ventures Incorporated	PO Box 727	Manahawkin	NJ

				(Patti B Clam Ventures Inc)			
?	?	?	C080	TMT Allocations Inc (Leprechaun Inc)	PO Box 727	Manahawkin	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C454	LET Ventures Incorporated (Leroy E Truex)	PO Box 727	Manahawkin	NJ
?	?	?	C584	Mabel Susan III Inc	12 Rabbit Run	Cape May	NJ
?	?	?	C099	Mabel Kim Inc	12 Rabbit Run	Cape May	NJ
?	?	?	C033	Big Diamond Inc	12 Rabbit Run	Cape May	NJ
?	?	?	C201	Anthony E and John D Martin	11014 Grays Corner Rd	Berlin	MD
114113	$11 million in revenues	Commercial fishing	C561	Roy Osmundsen	14 Whippoorwill Ln	Cape May Court House	NJ
114113	$11 million in revenues	Commercial fishing	C134	LET Ventures Incorporated (Starlight Comm Fish Inc)	PO Box 727	Manahawkin	NJ
?	?	?	C8270	Jacek Kubiak	8 Cove Dr	North Cape May	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C149	Wando River Corporation c/o Blount Fine Foods Corporation	630 Currant Rd	Fall River	MA
424460	100 employees	Fish and Seafood Merchant Wholesalers	C568	Daniel M Cohen	985 Ocean Dr	Cape May	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C515	Dolores Truex	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	C127	Gary Osmundsen	12 Rabbit Run	Cape May	NJ
114113	$11 million in revenues	Commercial fishing	C135	T & M Clammers Inc	PO Box 727	Manahawkin	NJ
114113	$11 million in revenues	Commercial fishing	C079	Lauren Kim Inc	12 Rabbit Run	Cape May	NJ

522130	$550 million in assets	Credit Unions	C656	Farm Credit East, ACA Attn: David A Bishop	2 Constitution Dr	Bedford	NH
?	?	?	C560	Mary Patricia Price	540 Hidden Pines Blvd	New Smyrna Beach	FL
?	?	?	C613	NSR Resources LLC	PO Box 727	Manahawkin	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C638	Vongole Ragazzi LLC	48 Gorton Rd	Millville	NJ
?	?	?	C229	Kenneth W and Sharon L Bailey	PO Box 12	Heislerville	NJ
114112	$11 million in revenues	Commercial fishing	C008	LET Ventures Incorporated (F/V Amanda Tara Inc)	PO Box 727	Manahawkin	NJ
522130	$550 million in assets	Credit Unions	C661	Farm Credit East, ACA ITF Surfside Clam Resources LLC	29 Landis Ave	Bridgeton	NJ
114113	$11 million in revenues	Commercial fishing	C071	Wyoming Boat Corporation	12 Rabbit Run	Cape May	NJ
?	?	?	C075	Seafish Inc	10134 Waterview Dr	Ocean City	MD
114113	$11 million in revenues	Commercial fishing	C063	T & P Vessel Inc	210 Hagen Rd	Cape May Court House	NJ
424460	100 employees	Fish and Seafood Merchant Wholesalers	C629	New Sea Rover Inc ITF Blount Seafood Corporation	114 Willow Dr	Cape May	NJ
114112	$11 million in revenues	Commercial fishing	C637	F/V Maude Platt Inc	515 Sanford Rd	Westport	MA
114113	$11 million in revenues	Commercial fishing	C011	D & L Commercial Fish Inc	PO Box 727	Manahawkin	NJ

9.0 LITERATURE CITED

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.

Awk, R. 1988. Microeconomic: Theory and applications. A Wiley/Hamilton Publication, John Wiley & Sons, Inc. 492 p.

Brandt, S. 2003. A Tale of Two Clams: Policy Anticipation and Industry Productivity. Department of Resource Economics, University of Massachusetts. Amherst, MA.

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.

Cargnelli LM, Griesbach SJ, Packer DB, Weissberger E. 1999a. Essential Fish Habitat Source Document: Atlantic surfclam, *Spisula solidissima*, Life History and Habitat Characteristics. NOAA Tech Memo NMFS NE 142; 13 p.

Cargnelli LM, Griesbach SJ, Packer DB, Weissberger E. 1999b. Essential Fish Habitat Source Document: Ocean Quahog, *Arctica islandica*, Life History and Habitat Characteristics. NOAA Tech Memo NMFS NE 148; 20 p.

Chute, Toni. Personal Communication. November 15, 2017. NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

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.

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

Hayes, S.A., E. Josephson, K. Maze-Foley, and P. E. Rosel. 2017. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2016. NOAA Technical Memorandum NMFS-NE-241.

Hennen, Dan. Personal Communication. March 22, 2018. NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

Leftwich, R. 1973. The price system and resource allocation. The Dryer Press. Hinsdale, Illinois 60521. 433 p.

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.

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). 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.

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. 1999. Sharing the Fish: Toward a National Policy on Individual Fishing Quotas. The National Academies Press, Washington, D.C.

NEFMC (New England Fishery Management Council). 2003. Amendment 13 to the Northeast Multispecies Fishery Management Plan. New England Fishery Management Council, Newburyport, MA.

NEFSC (Northeast Fisheries Science Center). 2002. Workshop on the effects of fishing gear on marine habitats off the northeastern United States, October 23-25, 2001. Northeast Fisheries Science Center Ref. Doc. 02-01, 86 p.

NEFSC (Northeast Fisheries Science Center). 2014. 59th Northeast Regional Stock Assessment Workshop (59th SAW) Assessment Summary Report. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-07; 39 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026. http://nefsc.noaa.gov/publications/

NEFSC (Northeast Fisheries Science Center). 2015. 2015 NE skate stock status update. http://www.nefmc.org/calendar/sept.-1-2015-ssc-meeting (item 2.3).

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

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). 2014. NMFS-Greater Atlantic Region (GARFO) Memo to the record: Determination regarding reinitiation of Endangered Species Act section 7 consultation on 12 GARFO fisheries and two Northeast Fisheries Science Center funded fisheries research surveys due to critical habitat designation for loggerhead sea turtles. Memo issued September 17, 2014.

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). 2017. 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 NEFSC FSB (National Marine Fisheries Service Northeast Fisheries Science Center Fisheries Statistics Branch). 2015. Northeast Fisheries Observer Program: incidental take reports. Omnibus data request + supplemental data for 2014.

NMFS NEFSC FSB (National Marine Fisheries Service Northeast Fisheries Science Center Fisheries Statistics Branch). 2016. Northeast Fisheries Observer Program: incidental take reports. Omnibus data request + supplemental data for 2015

NMFS NEFSC FSB (Northeast Fisheries Science Center, Fisheries Sampling Branch). 2017. Northeast Fisheries Observer Program (NEFOP) and At-Sea Monitoring (ASM) Program: Incidental Take Reports for Sea Turtles, Sturgeon, and Salmon. Omnibus data request + supplemental data from 1989-2016. Data compiled on May 10 and 15, 2017.

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.

NOAA Fisheries Greater Atlantic Regional Fisheries Office. 74 p. www.greateratlantic.fisheries.noaa.gov/policyseries/

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.

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.

Stenseth, N.C, Mysterud, A., Otterson, G., Hurrell, J.W., Chan, K., and M. Lima. 2002 Ecological Effects of Climate Fluctuations. *Science*. 297(5585); 1292-1296.

Stevenson D, Chiarella L, Stephan D, Reid R, Wilhelm K, McCarthy J, Pentony M. 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/

Thunberg, E., J. Walden, J. Agar, R. Felthoven, A. Harley, S. Kasperski, J. Lee, T. Lee, A. Mamula, J. Stephen, A. Strelcheck. 2015 Measuring changes in multi-factor productivity in U.S. catch share fisheries, *Mar. Policy* 62; 294–301.

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. 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.

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.

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.

Waring, G.T. , E. Josephson , K. Maze-Foley , and P. E. Rosel. 2016. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2015. NOAA Technical Memorandum NMFS-NE-238. http://www.nmfs.noaa.gov/pr/sars/pdf/atlantic2015_final.pdf

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.

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 M. Moore, Executive Director,
Mid-Atlantic Fishery Management Council,
Suite 201, 800 North State Street,
Dover, DE 19901

Appendix A

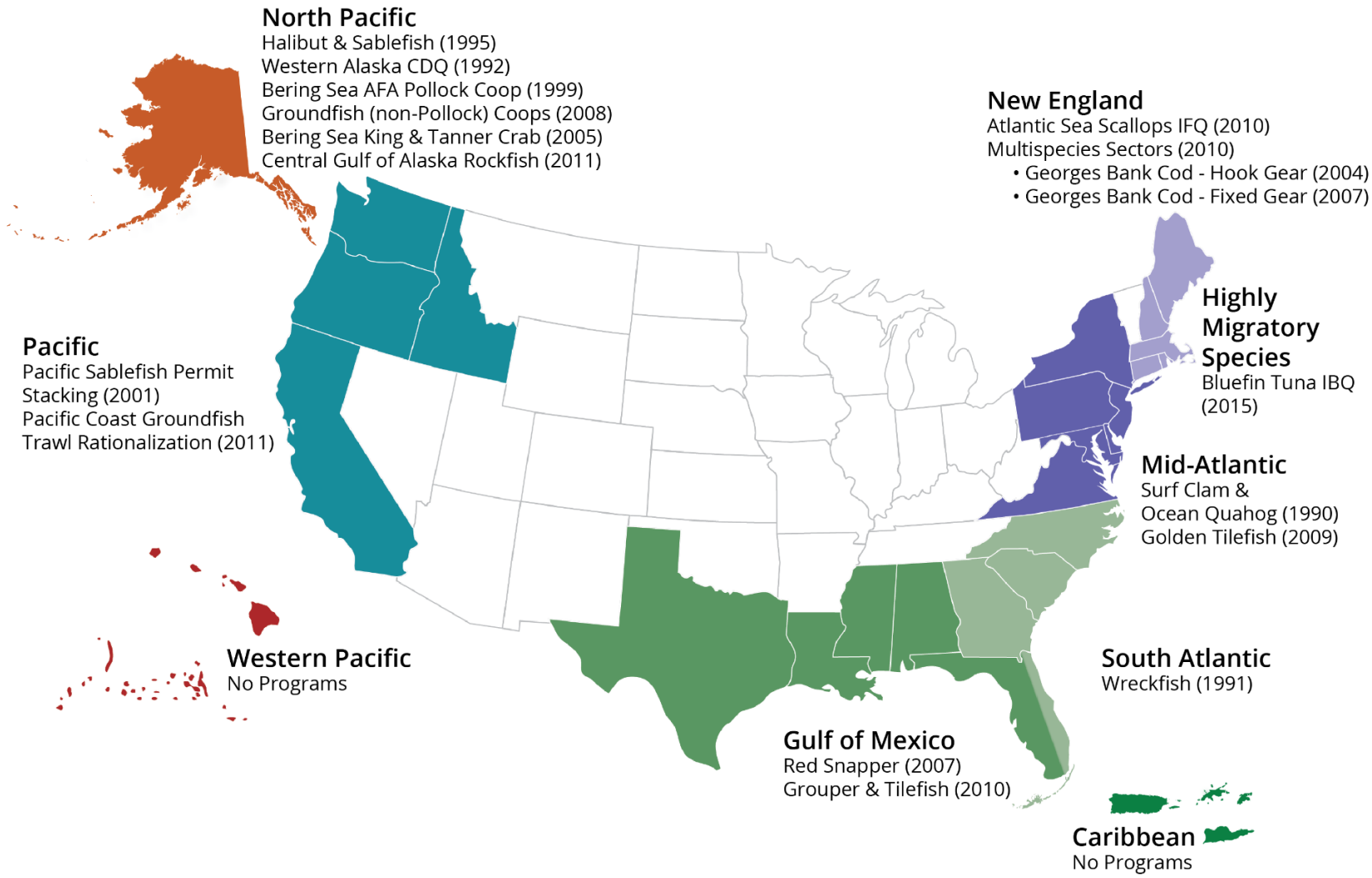
Catch Shares programs in the USA

"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.[46]

The information presented below was provided by Lindsay Fullenkamp (NOAA) and Wendy Morrison (NOAA).

[46] 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[47]; 5% cap on quota share[48]
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 share 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).

[47] 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.

[48] 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

Synthesis Document for

Review of Goals and Objectives for the Atlantic Surfclam and Ocean Quahog Fishery Management Plan

October 2017

Prepared by the Fisheries Leadership & Sustainability Forum

Contents

1 Context for revising goals and objectives

1.1 Project overview

The Council is reviewing and potentially revising goals and objectives for the Surfclam and Ocean Quahog (SCOQ) Fishery Management Plan (FMP) in support of the Council's 2014-2018 Strategic Plan and 2017 Implementation Plan, which identified reviewing and updating FMP goals and objectives as a priority. This initiative allows the Council to revisit and "refresh" FMP goals and objectives to ensure that they provide meaningful guidance and are consistent with today's fisheries and management context. The Council will follow a similar process to update goals and objectives for all FMPs.

The Council contracted with the Fisheries Leadership & Sustainability Forum (Fisheries Forum) to support this work by developing a process to support the Council's discussion. Between April and July 2017, Fisheries Forum staff conducted planning conversations with members of the Council's SCOQ Committee, SCOQ Advisory Panel (AP), and additional state agency representatives from states engaged in the fisheries. The Fisheries Forum also reviewed comments provided by the public during scoping hearings held in July 2017.

The Fisheries Forum synthesized this feedback to identify the major ideas and themes of discussion. The Council's Surfclam and Ocean Quahog Fishery Management Action Team (FMAT) reviewed this information and provided recommendations to help guide the Council's discussion. This document combines the Fisheries Forum's synthesis of feedback and the FMAT's recommendations. This information is intended to help frame and focus the Council's review of goals and objectives, and is not intended to be comprehensive of all ideas and perspectives.

The Council will discuss SCOQ FMP goals and objectives at the October 2017 Council meeting (October 10-12, 2017 in Riverhead, New York). At this time, the Council may adopt revisions to SCOQ FMP goals and objectives for inclusion in a public hearing document. The Council and public will have additional opportunities to provide input on this issue.

1.2 Original FMP objectives

The current FMP objectives were adopted in 1988 through Amendment 8 to the SCOQ FMP.

1. Conserve and rebuild Atlantic surf clam 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 requirement 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.

1.3 Terms: Goals, objectives, and strategies

As part of the Council's discussion and review of goals and objectives, it will be important to consider the appropriate terminology.

- Goals are broad, big picture, and aspirational. They can help communicate high-level values and priorities for SCOQ 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 may take to achieve objectives and support goals.

Goals and objectives are appropriate for the Council's discussion; however, specific management strategies would be appropriate to discuss in the context of other Council actions and will not be part of this discussion. Appendix 2 includes additional examples to help demonstrate the difference between goals, objectives, and strategies.

The four current SCOQ FMP objectives are described in Amendment 8 as objectives and not goals. Other Council FMPs include a combination of goals and objectives. Appendix 3 includes goals and objectives from all Mid-Atlantic FMPs. The Council could choose to consider structuring guidance for the SCOQ FMP in terms of goals, objectives, or both. The FMAT's recommendation includes a set of five goal statements with optional objectives for the Council's consideration.

1.4 MAFMC Strategic Plan

The Council's review of SCOQ FMP goals and objectives supports the Council's Strategic Plan and the 2017 Implementation Plan. The Council's 2014-2018 Strategic Plan identifies reviewing and updating FMP goals and objectives as a priority:

Management Goal: Develop fishery management strategies that provide for productive, sustainable fisheries.

Objective 11: Evaluate the Council's fishery management plans

Strategy 11.2: Review and update FMP objectives as appropriate to ensure that they remain specific, relevant, and measurable.

The Council's 2017 Implementation Plan has a list of proposed deliverables including "Review and revise FMP goals and objectives" for the SCOQ FMP.

1.5 Scoping questions

The following questions were included in the Council's July 2017 Scoping Guide for the Atlantic Surfclam and Ocean Quahog Excessive Shares Amendment to elicit feedback on SCOQ FMP goals and objectives. (The Excessive Shares Amendment will consider excessive shares and FMP goals and objectives as two separate issues.)

- Are the existing objectives appropriate for managing the surfclam and ocean quahog fisheries?

- Are there any objectives that appear outdated or do not reflect the way these fisheries are managed today? If so, how could they be updated?
- Is the intent of each objective clear? If not, how could they be reworded or clarified?
- Should any new goals and/or objectives be added?
- What else should the Council consider during the process of reviewing the objectives for the SCOQ FMP?

2 Feedback on goals and objectives

This section provides an overview of ideas and feedback to help inform the Council's review of SCOQ FMP goals and objectives. Contributors include members of the Council's SCOQ Committee and AP, additional state representatives from states engaged in the fisheries, and stakeholders who provided comments during the Council's July 2017 scoping hearings. Contributors commented briefly on the use of goals and objectives. Additional feedback focused on three themes: 1) relevance of the current objectives, 2) opportunities for revisions, and 3) other issues that may be pertinent to goals and objectives, including Council priorities and unique aspects of the surfclam and ocean quahog fisheries.

2.1 Use of goals and objectives

Managers and advisors who contributed to this project shared the following ideas related to the use of FMP goals and objectives. Most managers and advisors do not refer back to goals and objectives on a regular basis, if at all, but felt they have an important role in the FMP.

Purpose: Goals and objectives provide high level guidance or the "ground rules" for a fishery to ensure it is managed sustainably. Managers and advisors described goals and objectives as foundational to the FMP (e.g., the "blueprint", the "benchmark", the National Standards of the FMP) and the Council's message to the public and industry about how it intends to manage the SCOQ fisheries. Goals and objectives need to be long term and flexible to accommodate changing conditions.

Time horizon: Goals are meant to be long term; objectives are shorter term and a measure of the effectiveness of the set goals. Managers and advisors felt that goals and objectives need to be set for the long term to provide stability and allow the industry to make business decisions. Goals and objectives should also provide managers and the industry with short-term flexibility to address challenges and changing conditions. The appropriate time horizon for goals and objectives can also depend on the circumstances of a fishery and what is needed.

Audience: The intended audience for goals and objectives is a large group that includes the Council, NOAA Fisheries, industry, interested stakeholders, state agencies, non-governmental organizations, and consumers.

2.2 Relevance of the current objectives

Many contributors felt that the current FMP objectives continue to remain relevant and provide meaningful guidance despite significant changes in the surfclam and ocean quahog fisheries. Contributors shared the following reasons why they felt that the current objectives are relevant and appropriate in their current form.

Flexibility: Contributors felt that the objectives have remained relevant through significant biological changes to the SCOQ resources and regulatory changes to the fisheries. They described seeing changes including a shift in the center of biomass to the north, a decrease in fishing activity in the southern end of the range, encountering surfclams among ocean quahogs in deeper water, fleet consolidation after implementation of the Individual Transferable Quota (ITQ) system, and improvements to the science and research supporting management of the SCOQ resources. Contributors felt that the current objectives are sufficiently flexible to accommodate future changes.

Process and intent: Some contributors described their high regard for the wording and intent of the current set of objectives and the process that was originally followed to develop them, as well as their respect for the people who participated.

Performance: Contributors feel that management is working well, that the current objectives are being achieved, and that these objectives define one of the most successfully managed fisheries in the U.S. The objectives reflect the current social and economic circumstances of the fisheries and have minimized government and industry costs. In particular contributors noted that the stock is rebuilt, harvest rates are stable, management uncertainty is low, short-term economic dislocations have been minimized, and regulatory requirements are simplified. Some contributors also noted that safety has been improved.

Stability and consistency: Contributors feel that the current objectives and adoption of the ITQ program have allowed the industry to make efficient planning and business decisions.

Relationships and process: Contributors feel that the current objectives support an efficient and cooperative relationship between the Council, NOAA Fisheries, and industry.

Overall, contributors felt the fisheries are managed well and these original FMP objectives are still relevant. Some felt no changes or updates are necessary to the current objectives, while others felt a refresh and/or some minor wording updates could be helpful to modernize them.

2.3 Opportunities for revisions

Although contributors generally felt that the current SCOQ FMP objectives are still relevant, many suggested opportunities for revisions to ensure that objectives provide meaningful guidance, are clearly worded, and are consistent with the way the fisheries and the Council currently operate. These opportunities include minor wording adjustments as well as more comprehensive structural and content-related revisions.

2.3.1 Minor revisions

The following section describes opportunities identified by contributors for the Council to adjust, update, or clarify specific terms within each objective while preserving its intent. Contributors felt that objectives should be clearly worded to ensure that their intent is clear to managers, stakeholders, and enforcement.

Objective 1
Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.

- Update the objective: The Council could update this objective to reflect the need to maintain rather than “rebuild” the surfclam and ocean quahog resources, which are not overfished or undergoing overfishing. Many contributors felt “rebuild” is an outdated term and that refreshing this objective would acknowledge the progress made and that the SCOQ resources are sustainably managed.
- Clarify specific terms: Some felt it could be helpful to clarify some of the terms in this objective including “stabilizing” and “economic dislocations”. For example, harvest rates are stable and

the quota has been the same for years, so "stabilizing" may be a term that is more reflective of the fisheries in previous years.
- Other considerations: Some felt this objective could take the longevity of the species into consideration.

Objective 2

Simplify to the maximum extent the regulatory requirement 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.

- Wording: This objective could acknowledge other relevant aspects of managing the fisheries, such as monitoring.
- Update the objective: Many felt management of the SCOQ fisheries is straightforward and simple, and that this objective might reflect a time when management was more complicated. The Council could update this objective, for example, to focus on maintaining current regulatory requirements.

Objective 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.

- Update the objective: The current objective refers to "bringing harvest capacity into balance", however, contributors felt that harvesting capacity is in alignment with processing and biological capacity in the sustainable SCOQ fisheries. This portion of the objective could be updated to reflect the current fisheries and status of the resources.
- Clarify specific terms: Some weren't clear on the meaning of "economic efficiency" in this objective.

Objective 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.

- Clarify specific terms: Some contributors weren't sure what is meant by "unanticipated short term events" because there are not a lot of sudden changes in these fisheries and they are not aware of disruptions or destabilizing events that could occur in today's fisheries. However, some thought that changing environmental conditions could be considered an unanticipated event that could be reflected in this objective.

2.3.2 Structural and content revisions

In addition to the minor revisions above, some contributors felt that there are opportunities for the Council to make more significant structural and/or content-related revisions, ranging from minor to comprehensive changes to the existing objectives. (There may not be a clear delineation between "minor" and "significant" revisions, given that multiple minor revisions to one objective could result in substantial changes).

Order: The objectives could be ordered in terms of importance or priority.

Structure: Objectives could be combined or reorganized. For example, contributors noted that current objectives 3 and 4 both address industry operations.

Comprehensive revisions: The objectives could be completely revised. One example of a complete new set of goals and objectives was provided during the Council's July scoping hearings and is included as appendix to this document (Appendix 4: Example of revised goals and objectives provided by Bumble Bee Seafoods).

2.4 Other issues

The Council could consider how goals and objectives intersect with other Council priorities and unique aspects of the SCOQ resources and fisheries. Contributors identified several topics that are relevant to the SCOQ fisheries and could be relevant to a review of goals and objectives.

Ecosystem and habitat considerations: Implementation of the Council's Ecosystem Approach to Fisheries Management (EAFM) and effective use of the Essential Fish Habitat (EFH) authorities are Council priorities.

Climate and ecosystem changes: Some contributors are concerned about the impacts of ocean acidification to the long-lived, sessile surfclam and ocean quahog resources and feel that the fisheries need to remain adaptable to changing environmental conditions.

Scientific advances: Supporting advances in fishery-independent data collection and modeling that reflect the unique biology of surfclams and ocean quahogs helps to enhance the effective management of the SCOQ resources.

Changes to the fisheries: Contributors commented about the fisheries (both the biomass and fishing activity) shifting north into the geographical bounds of the New England Fishery Management Council and issues with accessible areas in New England due to the Omnibus Habitat Amendment.

Contributors noted other attributes of the fisheries that could be reflected in revised goals and objectives, including surfclams and ocean quahogs being a safe, high quality product. The longevity of the species is another unique attribute. Some also noted the importance of continuing to improve understanding of the resources, fisheries, and dependent communities, and the shared role of managers, industry, and science in the sustainable management of the SCOQ fisheries.

3 FMAT recommendation development

3.1 Context for FMAT recommendations

3.1.1 Outcomes from FMAT discussion

The Surfclam and Ocean Quahog FMAT convened via webinar on September 20, 2017, to consider the feedback obtained from planning conversations and scoping hearings, and to provide recommendations to help guide the Council's review of FMP goals and objectives. The FMAT recognizes that the Council will consider a range of possible options including:

- Making no changes to the current objectives
- Making minor changes or wording adjustments to the current objectives
- Making significant changes to the current objectives
- Developing a new set of revised objectives

The FMAT's discussion resulted in two outcomes to help support the Council's consideration of these options. The FMAT recommends that the Council discuss these two outcomes and determine how to proceed.

> Outcome 1: Discussion questions
> The FMAT developed a set of discussion questions (Section 3.2.1) to help guide the Council's discussion of SCOQ FMP goals and objectives and consideration of the options above.
>
> Outcome 2: Revised goals and objectives
> The FMAT recommended a set of goal statements and objectives (Section 3.2.2) for the Council's consideration of revised goals and/or objectives.

3.1.2 Rationale for FMAT recommendations

The FMAT developed Outcomes 1 and 2 after considering the guidance provided by the Council's 2014-2018 Strategic Plan (Section 1.4), the discussion questions used to elicit feedback from the public during the July 2017 scoping hearings (Section 1.5), and the feedback obtained from planning conversations and public comment (Section 2). The FMAT concluded that while the current SCOQ FMP objectives were carefully considered at the time they were developed, they should be revised to provide more useful guidance to the Council for the following reasons.

Acknowledge achievement and success. The current SCOQ FMP objectives reflect the intended and desired outcomes of Amendment 8. Aspects of these objectives have already been achieved. Revising FMP goals and objectives would acknowledge the improvements that have been made to the management of the SCOQ fisheries, recognize what is working well, and focus on maintaining and sustaining these improvements.

Clarify intent. Goals and objectives are an important public statement about what an FMP is trying to accomplish, and should be clear to stakeholders of all backgrounds. The current objectives and specific terms may not be clear to those who were not involved in the management process at the time

Amendment 8 was developed. Terms may also be confusing because they are not defined or have multiple definitions (e.g., economic efficiency). In addition, the current objectives are complicated and combine topics (e.g., Objective 1 addresses biology and economics). Revising goals and objectives would simplify and focus this guidance to clarify the Council's intent while still acknowledging the need to balance different objectives.

Provide flexible long-term guidance. The current SCOQ FMP objectives are short-term and focus on implementation of the ITQ program. Revising goals and objectives is an opportunity for the Council to develop broad, high-level guidance that describes the Council's longer-term intent for the fisheries, and is flexible to remain relevant over time and through changes to the fisheries.

Clearly identify FMP-level guidance. In addition to setting FMP goals and objectives, the Council may identify goals and/or objectives for specific amendments. For example, the Council identified objectives for Amendment 10 to the SCOQ FMP in 1998 (see Question 6 below). Furthermore, fisheries and FMPs evolve over time, and this can lead to a disconnect between the stated goals and/or objectives for an FMP and the way a fishery currently operates. Through the process of reviewing and revising FMP goals and objectives, the Council should clearly identify FMP-level guidance that is intended to carry forward through future Council actions, and ensure that this guidance reflects the current state of a fishery.

3.2 FMAT recommendations

3.2.1 Outcome 1: Discussion questions

The FMAT identified several discussion questions that may help inform the Council's consideration of goals and objectives for the SCOQ FMP.

Question 1: How does the Council want to structure guidance for the SCOQ FMP?
The Council could choose to structure guidance for the SCOQ FMP in the form of goals, objectives, or both. The FMAT feels that goals would provide valuable long-term guidance, but notes that this is an important structural consideration for the Council to discuss. The FMAT's recommendations include both goals and objectives but the FMAT could provide these in a different format.

Question 2: What does the Council view as the time frame for goals and objectives?
Time frame is an important consideration related to Question 1. Goals and objectives for biological sustainability may be essentially permanent, but other guidance may need to be adjusted over time. The FMAT suggests the Council consider the time frame for long-term guidance, how frequently the Council is likely to revisit FMP goals and objectives, and whether reviews are likely to occur as needed or on a set schedule. The FMAT considered how frequently the Council might revisit goals and objectives (for example, every 10 years, with every other iteration of the Council's Strategic Plan, or in conjunction with ITQ reviews) though did not endorse or recommend a time frame for review.

Question 3: What is the Council's intent for reviewing and potentially revising goals and objectives?
The FMAT suggests the Council consider whether goals and objectives are meant to maintain the current state of the fisheries or look ahead to the future. The FMAT's recommendations for revised goals and objectives (Section 3.2.2) reflect the current fisheries; the development of

forward-looking goals and/or objectives that imply change to the fisheries would be the purview of the Council.

Question 4: How could the Council's review of FMP goals and objectives acknowledge what is working well in the SCOQ fisheries?

Feedback from planning conversations and public comments emphasized that the current objectives are still viewed as relevant and that the fisheries are performing well, though opinions differed on whether the current objectives should be revised. The FMAT felt that revising goals and objectives would refocus FMP guidance and acknowledge improvements to the fisheries that should be maintained. The Council should consider how FMP goals and objectives can most effectively acknowledge what is working well in the SCOQ fisheries.

Question 5: How does the Council want to address measuring the performance of FMP goals and objectives?

The Council's 2014-2018 Strategic Plan states: *Review and update FMP objectives as appropriate to ensure that they remain specific, relevant, and measurable*. The FMAT suggests that the Council discuss this issue. In the future, the Council could request that FMATs give further consideration to measuring the performance of goals and objectives. Some FMAT members indicated that the goals recommended in Section 3.2.2 could be measured using quantitative and/or qualitative metrics.

Question 6: Does the Council want to acknowledge the Maine mahogany quahog fishery in FMP goals and objectives?

Amendment 10 to the SCOQ FMP in 1998 recognizes and provides for the continuation of a small fishery for ocean quahogs in federal waters off the state of Maine. Amendment 10 recognizes the overall objectives of the SCOQ FMP established by Amendment 8 and specifies an additional set of objectives[1]. The FMAT suggests that the Council consider whether this fishery should be acknowledged in overall FMP objectives. The FMAT also notes that the existence of amendment-specific objectives reinforces the need to clearly identify overall FMP objectives as guidance that should be carried forward into future actions.

Question 7: If the Council chooses to consider the draft goals and objectives proposed by the FMAT (Outcome 2), is the wording appropriate?

The FMAT and members of the public noted that the wording of goals and objectives is very important. The FMAT suggests the Council carefully consider the wording of each proposed goal and objective, possible interpretations and consequences, and the balance among goals and objectives as a whole.

[1] The additional objectives specifically for Amendment 10 to the Atlantic Surfclam and Ocean Quahog Fishery Management Plan (FMP) are:

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.

3.2.2 Outcome 2: Revised goals and objectives

The FMAT developed the following goal statements, optional objectives, and questions for the Council's consideration. These goals are derived from the existing SCOQ FMP objectives, statutory requirements of the Magnuson-Stevens Act (MSA), and feedback from planning conversations and public comment; and are reframed as overarching long-term aspirations. The FMAT notes that several long-term goals are embedded within the current SCOQ FMP objectives. The proposed goals and objectives are an effort to distinguish between longer-term goals and shorter-term objectives, simplify and clarify the wording and intent of the current objectives, and provide meaningful long-term guidance. The FMAT believes that the proposed goals are longer-term and would not need to be revised frequently. The objectives, though shorter-term, describe ongoing practices to maintain rather than action items to be completed.

This section includes a summary of the five goals and supporting objectives recommended by the FMAT, followed by a discussion of the FMAT's rationale for each proposed objective and an explanation of how the proposed goal and/or objectives relate to the current FMP objectives (e.g., an update, reorganization, or new content).

Summary of revised goals and objectives

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.

Goal 1: Biological sustainability

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

FMAT Discussion

Goal 1 is an update and simplification of the "conserve and rebuild" language from current Objective 1 (*Conserve and rebuild Atlantic surf clam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.*) This revision reflects the current status of the stocks, which are not overfished, undergoing overfishing, or undergoing rebuilding; and is versatile to provide guidance under all resource scenarios. This goal and the two objectives are consistent with the requirements of the MSA and are worded in a way that is more straightforward and understandable to the public.

The Council's recent review of summer flounder FMP goals and objectives may provide useful context for this proposed goal. The Council and the Atlantic States Marine Fisheries Commission's Summer Flounder, Scup, and Black Sea Bass Board (Board) considered a similarly worded goal for biological sustainability during their December 2015 review of summer flounder FMP goals and objectives, as part of the Comprehensive Summer Flounder Amendment. The FMAT for this amendment initially recommended a goal ("Ensure the biological sustainability of the summer flounder resource in order to maintain a sustainable summer flounder fishery") paired with two objectives ("Achieve and maintain a sustainable spawning stock biomass" and "Achieve and maintain a sustainable rate of fishing mortality.") The Council and Board recommended merging the two proposed objectives into a single objective that draws on the language of National Standard 1 to specifically address the topics of yield and avoiding overfishing, as follows: "Prevent overfishing, and achieve and maintain sustainable spawning stock biomass levels that promote optimum yield in the fishery." This proposed wording also builds on one of the original objectives for the FMP (Objective 3: Improve the yield from the fishery.) The Comprehensive Summer Flounder Amendment is ongoing and goals and objectives for this FMP have not yet been finalized.

Questions

- Does the Council want to develop one or more objectives related to this goal? For example, objectives could include "Maintain a sustainable biomass" and "Maintain a sustainable rate of fishing mortality." The FMAT notes that these objectives could reinforce and make explicit what is required by the MSA, though the FMAT feels adding objectives is not necessary.
- The Maine mahogany quahog fishery was developed after the current objectives were established. Does the Council want to explicitly acknowledge the Maine mahogany quahog fishery in goals and objectives? If so, where is the appropriate place to do so? An optional objective could read: Maintain the Maine mahogany quahog fishery.

Goal 2: Simplicity and efficiency

> 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.

FMAT Discussion

Goal 2 is a simplification and reorganization of the language in current Objective 2 (*Simplify to the maximum extent the regulatory requirement 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.*) The words "maintain" and "promote" recognize that these aspects of managing the fisheries have been improved over time.

Objectives 2.1 and 2.2 are new ideas. The FMAT felt that promoting compatibility between state and federal regulations (Objective 2.1) is important "common sense" guidance for supporting simple and efficient management. Objective 2.2 was added in response to planning conversations and public comments and refers to the Council's interest in coordinating and having a presence when the New England Council develops management measures that may impact the SCOQ fisheries.

Questions

Current Objective 2 recognizes specific aspects of the management process for which managers should minimize the government and private cost of administering and complying with requirements. These include regulatory, reporting, enforcement, and research requirements.

- Does the Council want to continue to recognize these specific requirements, for example by adding them to Objective 2.3?

Goal 3: Stability

> 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.

FMAT Discussion

This goal is a simplification and reorganization that focuses on the overarching value of stability by drawing on the language of two current objectives, Objective 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*) and Objective 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.*) Specifically, this overarching goal of stability addresses

the language of Objectives 3 and 4 referring to balancing harvesting, processing, and biological capacity; efficient utilization of capital resources, and long-term industry planning and investment needs.

The FMAT discussed the most appropriate terminology to describe stakeholders in the management of the surfclam and ocean quahog resources. FMAT members noted that the current objectives use the terms "industry" and "industry participants" and refer to both the harvesting and processing sectors. The FMAT also discussed whether the term "industry" explicitly includes the processing sector, and the relationship of the Council's management decisions to the processing sector. The FMAT suggested the phrase "surfclam and ocean quahog fisheries and fishing communities" as a simple and more encompassing term that includes all components of the SCOQ fishery.

Goal 4: Flexibility

> 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.

FMAT Discussion

Goal 4 is an update and revision of Objective 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*) and focuses on the values of flexibility and adaptability. Goal 4 and Objectives 4.1 and 4.2 also acknowledge issues identified during planning conversations, including concerns about changing environmental conditions and the Council's implementation of an ecosystem approach to fisheries management.

Objective 4.1 is a new idea recommended by the FMAT. The Council is able to comment on proposed plans (e.g., wind energy development) that may impact fish habitat. The Mid-Atlantic Council also has a representative to the Mid-Atlantic Regional Planning Body. The FMAT recommended Objective 4.1 to recognize the opportunity for the Council to engage more proactively in ocean planning processes to consider and communicate the SCOQ fisheries' interests. The FMAT also recommended including the reference to long-term changes in Objective 4.2 to recognize the need to respond to both short and long-term changes, as current Objective 4 refers only to short term events.

Goal 5: Information

> 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.

FMAT Discussion

Goal 5 and Objective 5.1 are new and are not based on any of the current SCOQ FMP objectives. This goal and objective are based on feedback from planning conversations and scoping comments. The FMAT and public participants in the FMAT's webinar discussed the use of the words "support" and "promote" in Goal 5. Public participants noted that the SCOQ industry has been proactive in supporting

and investing in research, and preferred the word “support” for Goal 5. The FMAT agreed that the use of the word “support” in Goal 5 is consistent with the Council’s role and responsibilities relative to science, monitoring, and data collection. The use of “promote” in Objective 5.1 recognizes that the Council can encourage and provide guidance to partners and other entities to focus research that will benefit management.

4.1 Appendix 1: Contributors

The Fisheries Forum requested input from members of the Council's SCOQ Committee and AP and additional state agency representatives in order to develop this document and to inform the FMAT's recommendations. Contributors shared feedback on fishery management plan goals and objectives for SCOQ management to help focus and frame the Council's discussion of this issue.

Fisheries Forum staff conducted 18 informal planning calls with Committee and AP members and state representatives involved in surfclam and ocean quahog management. In addition, Council staff collected public comments on this issue during scoping hearings held in July 2017.

The following individuals contributed to the development of this document through short planning calls.

Surfclam and Ocean Quahog Committee members

- Peter deFur, Appointee (VA)
- Peter Hughes, Appointee (NJ)
- Roger Mann, Appointee (VA)
- Stew Michels, Delaware Division of Fish & Wildlife
- Steve Heins, New York Department of Environmental Conservation
- Howard King, Appointee (MD)
- Wes Townsend, Appointee (DE)
- Patricia Bennett, U.S. Coast Guard
- Mike Ruccio, NOAA Fisheries
- Doug Potts, NOAA Fisheries

Surfclam and Ocean Quahog AP members

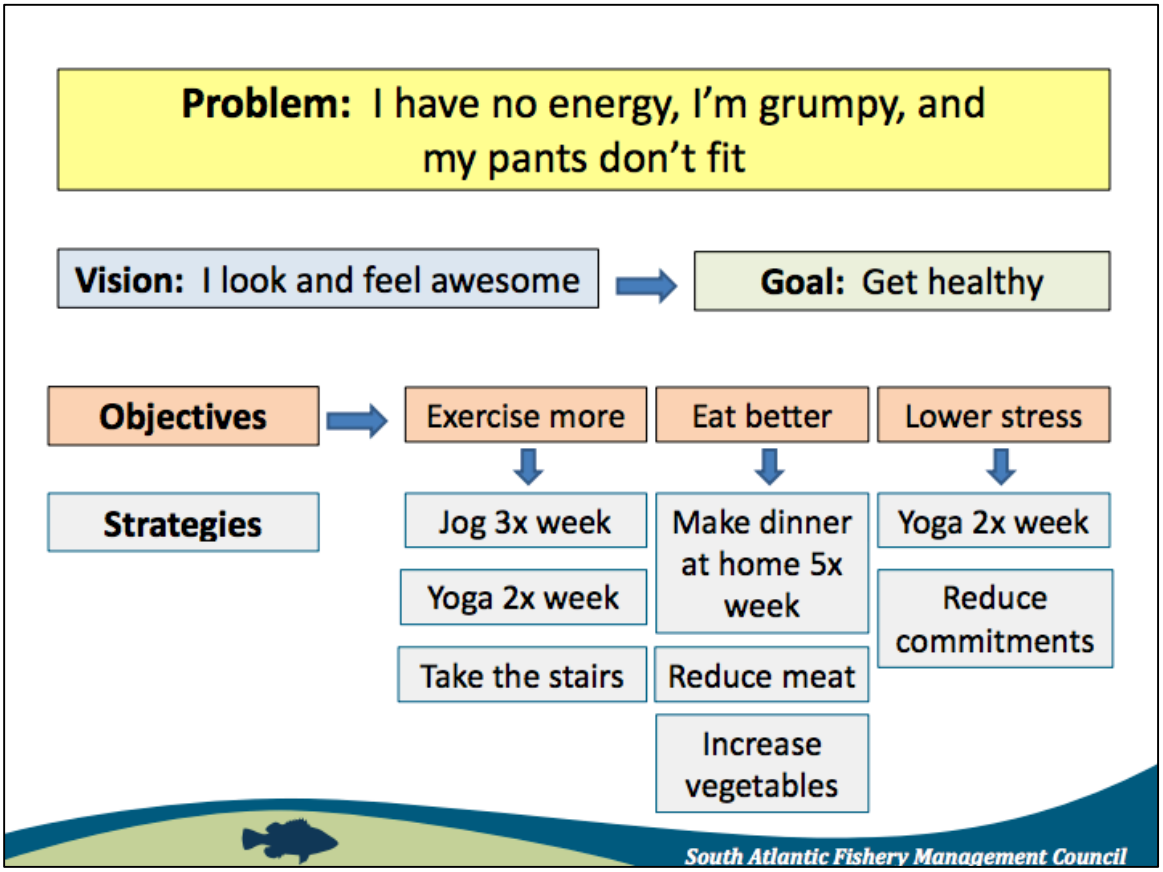
- Thomas Alspach (MD)
- Thomas Dameron (PA)
- Peter Himchak (NJ)
- Sam Martin (NJ)
- Joseph Myers (NJ) with Jeff Pike and Mike Kraft
- David Wallace (MD)

State agency representatives

- Tom Baum and Jeff Normant, New Jersey Division of Fish & Wildlife
- Terry Stockwell, Maine Department of Marine Resources

4.2 Appendix 2: South Atlantic Council example: Goals, objectives, and strategies

This diagram includes examples of goals, objectives, and strategies, and is excerpted from a staff presentation on strategic planning from the South Atlantic Fishery Management Council's March 2013 Council Visioning Workshop.



The full presentation is available online:
http://cdn1.safmc.net/wp-content/uploads/2016/11/28101424/2BB_Attach2b_StrategicPlanningPres-1.pdf

Additional information about the Council's Snapper-Grouper Visioning Process, and resources from past meetings, are available on the council's website.
http://www.safmc.net/resource-library/council-visioning-project

4.3 Appendix 3: Mid-Atlantic Fishery Management Council FMP goals and objectives

Summer Flounder, Scup, Black Sea Bass

1. Reduce fishing mortality in the summer flounder, scup, and black sea bass fisheries to assure that overfishing does not occur.
2. Reduce fishing mortality on immature summer flounder, scup, and black seabass to increase spawning stock biomass.
3. Improve the yield from the fishery.
4. Promote compatible management regulations between state and Federal jurisdictions.
5. Promote uniform and effective enforcement of regulations.
6. Minimize regulations to achieve the management objectives stated above.

Bluefish

1. Increase understanding of the stock and of the fishery.
2. Provide the highest availability of bluefish to U.S. fishermen while maintaining, within limits, traditional uses of bluefish.
3. Provide for cooperation among the coastal states, the various regional marine fishery management councils, and federal agencies involved along the coast to enhance the management of bluefish throughout its range.
4. Prevent recruitment overfishing.
5. Reduce the waste in both the commercial and recreational fisheries.

Spiny dogfish

1. Reduce fishing mortality to ensure that overfishing does not occur.
2. Promote compatible management regulations between state and Council jurisdictions and the US and Canada.
3. Promote uniform and effective enforcement of regulations.
4. Minimize regulations while achieving the management objectives stated above.
5. Manage the spiny dogfish fishery so as to minimize the impact of the regulations on the prosecution of other fisheries, to the extent practicable.
6. Contribute to the protection of biodiversity and ecosystem structure and function.

Squid, Mackerel, Butterfish

1. Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2. Promote the growth of the U.S. commercial fishery, including the fishery for export.
3. Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4. Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5. Increase understanding of the conditions of the stocks and fisheries.
6. Minimize harvesting conflicts among U.S. commercial, U.S. recreational, and foreign fishermen.

Surfclam and Ocean Quahog

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 requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with

regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean 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.

Tilefish

The overall goal of this FMP is to rebuild tilefish so that the optimum yield can be obtained from this resource. To meet the overall goal, the following objectives are adopted:

1. Prevent overfishing and rebuild the resource to the biomass that would support MSY.
2. Prevent overcapitalization and limit new entrants.
3. Identify and describe essential tilefish habitat.
4. Collect necessary data to develop, monitor, and assess biological, economic, and social impacts of management measures designed to prevent overfishing and to reduce bycatch in all fisheries.

4.4 Appendix 4: Example of revised goals and objectives provided by Bumble Bee Seafoods

The following is an excerpt from scoping comments provide in a letter from Bumble Bee Seafoods to the Mid-Atlantic Fishery Management Council, July 12, 2017. These comments are the only example of a new full set of goals and objectives suggested by contributors to this project, and are included in this document for reference.

Bumble Bea Seafood supports the Council's effort to revise the goals and objectives for the OQSC FMP as they are not consistent with today's fishery and management issues. Provided below is a list of revised/rewritten goals and objectives which we believe more accurately reflect today's fishery:

1. Conserve and sustainably manage the Atlantic surf clam and ocean quahog resources throughout the management unit to prevent overfishing and ensure that the resource is not overfished while achieving optimum yield from the resource.
2. Promote opportunities for government and industry scientific research, especially into the effects of warming ocean temperatures and changing ocean conditions on the OQSC resources, and research necessary for sound management decisions.
3. Provide a simplified management regime and regulatory framework that minimize government and industry cost while allowing participants to achieve economic efficiency including efficient utilization of capital resources by industry.
4. Promote compatible management regulations between state and Councils jurisdiction.
5. Strengthen coordination between the New England Fishery Management Council and the Mid-Atlantic Fishery Management Council so that actions by one Council do not negatively impact the ability of industry to achieve optimum yield.

Appendix C

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
Ocean pout	juvenile	GOM, GB, SNE, Mid-Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts Bay, and Cape Cod Bay	< 50	Close proximity to hard bottom nesting areas

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

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