

**SPECIES SEPARATION REQUIREMENTS
AMENDMENT
AMENDMENT XX TO THE ATLANTIC SURFCLAM
AND OCEAN QUAHOG
FISHERY MANAGEMENT PLAN**

Public Hearing Document

May 2024

**Mid-Atlantic Fishery Management Council
in cooperation with
the National Marine Fisheries Service (NMFS)**

Council Address

**Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901**

NMFS Address

**Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930**



Opportunities to Comment

The Mid-Atlantic Fishery Management Council (Council) is requesting public comments on a draft action (“amendment”) to modify the species separation requirements in the Atlantic surfclam and ocean quahog fisheries. This action would modify regulations to address the increased occurrence of mixed surfclam and ocean quahog catches in these fisheries. The Public Hearing Document describes a range of management approaches (“alternatives”) that could address this issue and provides a summary of associated impacts. The Council will consider public input on the alternatives described in this document at the June 2024 Council Meeting and recommend an alternative to NOAA Fisheries for review and rulemaking.

Public Hearings

Comments may be submitted at any of the following public hearings:

1. **Thursday, May 9, 2024. 6 p.m. – 9 p.m. Webinar.** Connection details can be found at the Council's website calendar at <https://www.mafmc.org/council-events>.
2. **Tuesday, May 14, 2024. 6:30 p.m. – 9:30 p.m.** Embassy Suites Philadelphia Airport. 9000 Bartram Avenue, Philadelphia, PA 19153. 215-365-4500.
3. **Thursday, May 16, 2024. 6:30 p.m. – 9:30 p.m.** Hyatt Place Boston/Braintree. 50 Forbes Rd, Braintree, MA 02184. 781-848-0600.

Written Comments

Written comments may be submitted by any of the methods listed below. Comments must be received by **11:59 p.m. EST on May 30, 2024**.

- **Email** to: jcoakley@mafmc.org (use subject “SCOQ Species Separation”)
- **Online** at: <https://www.mafmc.org/comments/scoq-species-separation>
- **Mail** to: Christopher Moore, Ph.D., Executive Director, Mid-Atlantic Fishery Management Council, 800 North State Street, Suite 201, Dover, DE 19901. Mark the outside of the envelope “SCOQ Species Separation.”

Tips for Providing Public Comment

We value your input. To be most effective, we request that your comment include specific details as to why you support or oppose a particular proposed approach.

Specifically, please address the following:

- Which proposed alternatives do you support, and which do you oppose?
- Why do you support or oppose them?
- Is there any additional information you think should be considered?

Questions? Contact Jessica Coakley at: jcoakley@mafmc.org or 302-526-5252.

1.0 EXECUTIVE SUMMARY

The purpose of this action is to modify the species separation requirements in the Atlantic surfclam and ocean quahog Individual Transferable Quota (ITQ) fisheries. This action would amend the Fishery Management Plan (FMP) and modify fishery management regulations to address the issue of mixed surfclam and quahog catches that are currently occurring on board fishing vessels, an issue raised by some members of the clam fishing industry. The mixing of catches in these fisheries has created issues associated with the reliability and quality of the catch data being collected, creates additional challenges related to accurate tracking of allocation use in these fisheries, and complicates the enforceability of the regulations. In addition, industry members have indicated that mixing clam catches makes it difficult to comply with existing management regulations that require only single species declared trips. In addition, industry members have indicated that the increasing frequency of mixed catches in these fisheries will impact on board fisheries operations, creating logistical and economic challenges in the long-term that need to be addressed. As such, regulatory changes are needed to improve data collection and management of the Atlantic surfclam and ocean quahog ITQ programs. Other Limited Access Privilege Programs (LAPPs) with mixed catches have had similar challenges; therefore, some of the measures considered were drawn from other successfully implemented approaches.

This document details the management alternatives being considered and the impacts of those alternatives. Box ES-1 on the following page provides a summary of how well each alternative would address the issues related to reliability and quality of the catch data, accuracy of allocation tracking, and ability to enforce the requirements and verify the catch. High, moderate, and low indicate how well the alternative addresses that specific issue. For example, an alternative may create difficulties with allocation tracking, and therefore be ranked low, or an alternative may be much easier to enforce than others and be ranked high in that category. Some alternatives may be more or less expensive to implement, and cost is qualitatively noted as low cost to high cost. In addition, comments on the feasibility and whether the approach has been employed elsewhere are noted in Box ES-1 as well.

Box ES-1. Summary of the species separation requirements alternatives under consideration.

Alternatives	Brief Description of Alternatives	Catch Monitoring	Allocation Tracking	Enforceability	Cost	Feasible/Approach Applied Elsewhere
Alternative 1 (No Action/ <i>Status Quo</i>)	No changes would be made to the current regulations for surfclam and ocean quahog.	Low	Low	Low	N/A	Some industry members and the Surfclam and Ocean Quahog Committee have noted that action is needed, and that no action does not address the issue.
Alternative 2 (Require On board Sorting, No Mixing in Cages)	<u>Explicitly</u> require on board sorting and reporting of all discards.	Moderate	Moderate	Moderate	Moderate	Some industry members have stated that fully sorting on board is not a feasible solution for their vessels and/or processor groups.
Alternative 3 (At-Sea Catch Monitoring)	Implement on board sampling protocols developed by NOAA Fisheries to determine catch and discards on board the fishing vessel for each monitored trip.	High	High	High	High	Other limited access programs with mixed catch/discard issues have similar programs (i.e., Northeast Groundfish Catch Share Sectors, West Coast Groundfish IFQ).
Alternative 4 (Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer)	Require full retention of both clam species on board the fishing vessel. Sorting would occur at the dealer.	Moderate	Moderate	Low	High	Some industry members have stated that sorting at the dealer is the most feasible for them; however, this is the least enforceable of the options compared to the no action.

<p>Alternative 5 (Full Retention of Both Surfclam and Ocean Quahog; Sort at Dealer with Shoreside Catch Monitors)</p>	<p>Require full retention of both clam species on board the fishing vessel. Sorting would occur at the dealer. Catch monitors would be required in the dealer.</p>	<p>High</p>	<p>High</p>	<p>High</p>	<p>High</p>	<p>Industry members have stated that sorting at the dealer is the most feasible for them. The presence of NOAA catch monitors improves catch verification and enforceability. This approach is utilized for another LAPP program (i.e., West Coast Groundfish IFQ).</p>
<p>Alternative 6 (Require Electronic Monitoring, Allow for Mix in Cages)</p>	<p>Allow the mixing of both clam species within the cages with the implementation of a new onboard electronic monitoring (EM) program to assess catch composition.</p>	<p>High</p>	<p>High</p>	<p>High</p>	<p>High to Low (over time)</p>	<p>Not possible as a solution in the short term; this new EM program would require long-term development but could be feasible in the long term. Other fisheries are utilizing EM solutions.</p>

2.0 LIST OF FREQUENTLY USED ACRONYMS, CONVERSIONS, AND DEFINITIONS

Frequently Used Acronyms

AP	Advisory Panel
bu	Bushels
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EM	Electronic Monitoring
ESA	Endangered Species Act
e-tag	Electronic Tag
eVTR	Electronic Vessel Trip Report
FMAT	Fishery Management Action Team
FMP	Fishery Management Plan
GARFO	Greater Atlantic Regional Fisheries Office
IFQ	Individual Fishing Quota
ITQ	Individual Transferable Quota
LAPP	Limited Access Privilege Program
MAFMC	Mid-Atlantic Fishery Management Council (Council)
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NEPA	National Environmental Policy Act
mt	Metric Ton
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NEFOP	Northeast Fishery Observer Program
R&D	Research and Development
SERO	NOAA Southeast Regional Fisheries Office
U.S.	United States
VMS	Vessel Monitoring Systems

Conversions

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

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4.0 INTRODUCTION AND BACKGROUND

4.1 PURPOSE AND NEED

The purpose of this action is to modify the species separation requirements in the Atlantic surfclam and ocean quahog ITQ fisheries. This action would amend the FMP and make changes to the regulations to address the issue of mixed catches that are currently occurring on board clam vessels. Regulations may be modified at various levels to address on board or shoreside operations (e.g., sorting, monitoring, etc.) and other regulations as needed.

This action to update fishery regulations is needed because of the increased frequency of mixed catches in these fisheries, an issue raised by some members of the clam fishing industry. Industry members have indicated that the mixing of catches creates challenges associated with existing management regulations that require only single species declared trips. The mixing of catches in these fisheries has created issues with the reliability and quality of the catch data being collected, and creates additional challenges related to accurate tracking of allocation use in these fisheries as well as the enforceability of the regulations. At present, a mix of clams is being caught, and the non-target clam species (e.g., quahog on a surfclam trip or surfclam on a quahog trip) are being discarded at-sea or landed in mixed clam cages. These mixed landings and discards are not being consistently reported as landings and/or discards in vessel trip reports (VTRs) or as discards at the dealer. Therefore, regulatory changes are needed to improve data collection and monitoring of the surfclam and ocean quahog catches. This is also inconsistent with the ITQ system which requires cage tags and allocation for each species landed. No enforcement or monitoring of these mixed catches is occurring, and enforcement continues to rely on cage tagging as a primary means of verifying the catch. Finally, industry and survey data (Appendix A) indicate that the overlap of these species distributions is increasing.

4.2 BACKGROUND ON THIS ACTION

Separate trip and cage tagging requirements were implemented for Atlantic surfclam and ocean quahog as part of the ITQ system to allow landings to be tracked separately, and to eliminate incentives to use less expensive quahog tags to land surfclam cages on the same trip. The current regulations do not allow both surfclam and ocean quahog to be landed on the same trip or to be placed in the same cage.

Some industry members have noted that they avoid areas where species co-occur to the extent possible because mixed catches are undesirable, as processors can only process one species at a time. However, despite both regulatory and economic incentives to avoid mixed catches, industry members have reported that mixing of these clams is occurring more frequently, and it may become a larger problem in the future due to climate change (see Appendix A for more details from fishery-independent surveys on this mixing issue). Some industry members recommended that the Council address this regulatory issue; the Council began work on this action in 2020.

The Council recognizes there are catch monitoring and enforcement issues associated with mixed catches of surfclam and ocean quahog. At present, no enforcement or monitoring of these mixed catches is occurring. As a result, data is not being collected in a manner consistent with the requirements of these ITQ fisheries.

5.0 MANAGEMENT ALTERNATIVES AND EXPECTED IMPACTS

This action considers a range of alternatives that would modify the species separation requirements in the Atlantic surfclam and ocean quahog ITQ fisheries. This action would not modify the allocation or requirements for the small Maine Mahogany quahog fishery. In recognition of the diversity of potential solutions to this issue, a range of possible options for management measures (“alternatives”) were developed for consideration. This approach complies with the statutory requirements to include a range of alternatives when evaluating the environmental impacts of federal actions.

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

5.1 Alternative 1 - No Action/Status Quo

Under this alternative, no changes would be made to the current regulations for surfclam and ocean quahog, which state that only single species declared trips are permitted (i.e., a trip must be declared under the Vessel Monitoring System (VMS) as a surfclam or ocean quahog trip) and only that declared species may be landed and placed in cages on board the vessel. This alternative assumes that each ITQ tagged cage only contains the target species.

5.2 Alternative 2 - Require On board Sorting, No Mixing in Cages

On a declared surfclam trip, on board sorting would be explicitly required to ensure the cages on board the vessel are filled with surfclam only, and the cages on board are all tagged as surfclam. All discards of ocean quahog, or other species, must be reported on the electronic Vessel Trip Reports (eVTRs).

On a declared ocean quahog trip, on board sorting would be explicitly required to ensure the cages on board the vessel are filled with ocean quahog only, and the cages on board are all tagged as ocean quahog. All discards of surfclam, or other species, would be reported on the eVTRs.

These measures are intended to ensure there is a precise and accurate representation of catch to support the stock assessment and set catch limit levels that prevent overfishing and determine when catch limits are exceeded in these ITQ fisheries. When regulations were first implemented in these ITQ fisheries in 1990, there was less habitat overlap between surfclam and ocean quahog, and more high density inshore surfclam beds were available to be fished. Therefore, a fishing trip could be prosecuted without encountering large numbers of the other clam species. As such, the regulations for separate trips did not explicitly require sorting in the regulations, although it is implied as written in the regulations that sorting is needed. In addition, discarding was not or was only minimally reported. Current regulations require the discards of other species to be reported on eVTRs. No other changes would be made to the current regulations and all data reporting requirements would still apply.

5.3 Alternative 3 - At-Sea Catch Monitoring

An at-sea catch monitoring program would be required to improve the accuracy of collected catch data (landings and discards) and catch accounting. These measures are intended to ensure there is a precise and accurate representation of catch to support the stock assessment and set catch limit levels that prevent overfishing and determine when catch limits are exceeded in these ITQ fisheries. This approach would provide detailed information to understand the scale and scope mixing of the catch (including discards going overboard, and the extent of mix within cages to be landed) during current fishing operations.

The at-sea catch monitoring coverage target would be at least 90 percent of total annual trips for 3 years.¹ At-sea catch monitors would follow on board sorting protocols developed by NOAA Fisheries to determine catch (both landings and discards) on board the fishing vessel for each monitored trip. The catch monitor's primary duties would include monitoring and verification of the catch disposition of surfclam and ocean quahog relative to Federal requirements as specified, documentation of the volumes of these species landed, and verification of reporting relative to data collection requirements. Catch monitors would have unobstructed access to catch sorting, catch counting, and the development of any catch disposition records on board.

Vessels fishing shoreward of 30 m (98 feet) would be exempt from this requirement, as ocean quahogs are rarely found shallower than this depth (Hennen, Dan, NMFS/NEFSC, Personal Communication November 13, 2023). NOAA Fisheries would work with enforcement to develop straight line boundaries of the 30 m (98 feet) contour to facilitate ease of enforcement.

Exclusions from the monitoring requirement would be permitted for vessels already carrying Northeast Fishery Observer Program (NEFOP) observers. Other exclusions could be considered for those vessels willing to implement an EM/audit model approved by NOAA Fisheries.²

The Council would review this information after two full years of catch data are available (in year 3) to determine if changes are warranted to the program and how well the monitoring program improved catch data accuracy while maximizing the value of the data and minimizing costs.

Under this program all trips would still be required to declare a VMS surfclam or ocean quahog trip (the intended species target).

¹ Up to 3 percent cost recovery from the ITQ programs could be used to cover the costs. It needs to be determined who would be responsible for the remaining costs if that funding is not sufficient (i.e., industry or NOAA Fisheries) or if the coverage level would need to be reduced, and who would make that determination. In addition, it may be appropriate to consider how cost recovery collects fees; for example, sending bills to the dealers that collect fees on used tags versus billing ITQ individual owners.

² For example, vessels could be exempt if they measure all clam discards (non-target clams and other species) under a camera prior to discarding and in view of cameras at designated discard control points on their vessel. The vessel operator could estimate the volume of clam discards on an eVTR and submit the video footage to the EM service provider. The EM service provider would review trips selected for audit and develop an independent estimate of discards for the trip.

Under this alternative, the system of cage tagging would need to be modified to avoid exceeding ITQ quotas during the fishing year, and to ensure that enough ITQ cage tags of both species are available on board fishing vessels.

In year 1, a surfclam VMS declared trip would require 1 surfclam tag (i.e., 32 bushels) and 0.5 ocean quahog tag (i.e., 16 bushels) per cage carried on board the vessel, and to be affixed to the cage prior to offloading (i.e., if a vessel carries 50 cages it would be required to carry 50 surfclam tags and the equivalent of 25 ocean quahog tags). Tag issuance could be modified to allow for purchase of 0.5 cage tags. In subsequent years, after the catch monitoring program has collected data on the extent of the mixed catches, the projected amount of ITQ allocation cage tags needed to be affixed to a cage could be modified (e.g., 1 surfclam tag plus a 0.25 ocean quahog tag) may ensure sufficient ITQ allocation is on board the vessel. Similarly, on an ocean quahog trip in year 1, a quahog VMS declared trip would require 1 ocean quahog tag and 0.5 surfclam tags per cage carried on board the vessel, and to be affixed to the cage prior to offloading (i.e., if a vessel carries 50 cages it would be required to carry 50 ocean quahog tags and the equivalent of 25 surfclam tags).

5.4 Alternative 4 - Full Retention of Both Surfclam and Ocean Quahog, Sort at Dealer

On a declared surfclam or ocean quahog trip, full retention of both clam species (surfclam and ocean quahog) on board the vessel once the dredge material has moved through the shaker would be required. All discards of other species would still be reported on the eVTRs.

At the dealer facility, each fishing trip would be separated and sorted separately with all target and non-target clam species volumes sorted and reported on the dealer reports for that trip using a standardized protocol to be developed and approved by NOAA Fisheries. Equipment inspection and standardization will be needed to ensure measurement of volumes of bushels of clams is consistent and standardized across facilities receiving and sorting cages.³

Under this alternative, the system of cage tagging would need to be modified to avoid exceeding ITQ quotas during the fishing year, and to ensure that enough ITQ cage tags of both species are available on board fishing vessels.

In year 1, a surfclam VMS declared trip would require 1 surfclam tag (i.e., 32 bushels) and 0.5 ocean quahog tag (i.e., 16 bushels) per cage carried on board the vessel, and to be affixed to the cage prior to offloading (i.e., if a vessel carries 50 cages it would be required to carry 50 surfclam tags and the equivalent of 25 ocean quahog tags). Tag issuance could be modified to allow for purchase of 0.5 cage tags. In subsequent years, after the catch monitoring program has collected data on the extent of the mixed catches, the projected amount of ITQ allocation cage tags needed to be affixed to a cage could be modified (e.g., 1 surfclam tag plus a 0.25 ocean quahog tag) may ensure sufficient ITQ allocation is on board the vessel. Similarly, on an ocean quahog trip in year 1, a quahog VMS declared trip would require 1 ocean quahog tag and 0.5 surfclam tags per cage carried on board the vessel, and to be affixed to the cage prior to offloading (i.e., if a vessel carries

³ The West Coast Groundfish IFQ has inspection requirements and a sticker system that indicates equipment has been inspected as part of their shoreside monitoring program.

50 cages it would be required to carry 50 ocean quahog tags and the equivalent of 25 surfclam tags).

5.5 Alternative 5 - Full Retention of Both Surfclam and Ocean Quahog, Sort at Dealer with Catch Monitors

A new catch monitor program would be developed along with other changes to regulations.⁴ On a declared surfclam or ocean quahog trip, full retention of both clam species (surfclam and ocean quahog) on board the vessel once the dredge material has moved through the shaker would be required. All discards of other species would still be required to be reported on the eVTRs. Exclusions from the full retention requirement would be permitted for vessels already carrying NEFOP observers. Other exclusions could be considered for those vessels willing to implement an EM/audit model approved by NOAA Fisheries.⁵ However, this would require developing approaches to reconcile the data collected at sea with that produced on shore.

At the dealer facility, each fishing trip would be separated and sorted separately with all target and non-target clam species volumes sorted and reported on the dealer reports for that trip using a standardized protocol to be developed and approved by NOAA Fisheries. Equipment inspection and standardization will be needed to ensure measurement of volumes of bushels of clams is consistent and standardized across facilities receiving and sorting cages.⁶

A catch monitor would be used to confirm that the ITQ landings are accurately sorted and reported and would produce a separate catch report to be used to verify the dealer reports. All catch monitors would receive appropriate training and be certified by NOAA Fisheries. Catch monitors would be deployed to dealers that are first receivers of surfclam and/or ocean quahog cages. The catch monitor's primary duties would include monitoring and verification of the sorting of surfclam and ocean quahog relative to Federal requirements as specified, documentation of the volumes of these species landed, and verification of the dealers reporting relative to data collection requirements. Catch monitors would have unobstructed access to catch sorting, processing, catch counting, and the development of any catch disposition records. A dealer would be prohibited from receiving, purchasing, or taking custody, control, or possession of a delivery of surfclam or ocean quahog cages without catch monitor coverage. A first receiver site license would be utilized for the dealers and their physical sites that receive surfclam and ocean quahog ITQ cages to ensure consistency with the terms and conditions required to implement this program.

⁴ Up to 3 percent cost recovery from the ITQ programs could be used to cover the costs. It needs to be determined who would be responsible for the remaining costs if that funding is not sufficient (i.e., industry or NOAA Fisheries) or if the coverage level would need to be reduced, and who would make that determination. In addition, it may be appropriate to consider how cost recovery collects fees; for example, sending bills to the dealers that collect fees on used tags versus billing ITQ individual owners.

⁵ For example, vessels could be exempt if they measure all clam discards (non-target clams and other species) under a camera prior to discarding and in view of cameras at designated discard control points on their vessel. The vessel operator could estimate the volumes of clam discards on an eVTR and submit the video footage to the EM service provider. The EM service provider would review trips selected for audit and develop an independent estimate of discards for the trip.

⁶ The West Coast Groundfish IFQ has inspection requirements and a sticker system that indicates equipment has been inspected as part of their shoreside monitoring program.

This catch monitor program would be like the one currently utilized for the West Coast Groundfish IFQ program which has been in place since 2011 to support catch monitoring at shoreside facilities that first receive fish from fishing vessels.

Under this alternative, the system of cage tagging would need to be modified to avoid exceeding ITQ quotas during the fishing year, and to ensure that enough ITQ cage tags of both species are available on board fishing vessels.

In year 1, a surfclam VMS declared trip would require 1 surfclam tag (i.e., 32 bushels) and 0.5 ocean quahog tag (i.e., 16 bushels) per cage carried on board the vessel, and to be affixed to the cage prior to offloading (i.e., if a vessel carries 50 cages it would be required to carry 50 surfclam tags and the equivalent of 25 ocean quahog tags). Tag issuance could be modified to allow for purchase of 0.5 cage tags. In subsequent years, after the catch monitoring program has collected data on the extent of the mixed catches, the projected amount of ITQ allocation cage tags needed to be affixed to a cage could be modified (e.g., 1 surfclam tag plus a 0.25 ocean quahog tag) may ensure sufficient ITQ allocation is on board the vessel. Similarly, on an ocean quahog trip in year 1, a quahog VMS declared trip would require 1 ocean quahog tag and 0.5 surfclam tags per cage carried on board the vessel, and to be affixed to the cage prior to offloading (i.e., if a vessel carries 50 cages it would be required to carry 50 ocean quahog tags and the equivalent of 25 surfclam tags).

5.6 Alternative 6 - Require Electronic Monitoring, Allow for Mix in Cages

Under this alternative, on a declared surfclam or ocean quahog trip, the mixing of both clam species within the cages would be permitted with the implementation of onboard EM requirements to assess the catch composition on those trips (i.e., electronically quantify the catch). All trips would still be required to declare a VMS surfclam or ocean quahog trip (the intended target).

A new EM program⁷ would be developed to require electronic inspection of the clams prior to the cages being filled – ideally the material would be inspected while traveling down the belt from the dredge to the cages prior to any on board sorting. To capture the bulk of the catch, cameras would be placed on board the fishing vessel to capture images once the dredge material has moved through the shaker, but prior to any material being handled or sorted by crew.

This is a longer-term solution as it would require substantial technical development over several years to test and deploy this new technology to ensure that the catch can be accurately and precisely monitored. Under this new program, changes would need to be made to how ITQ allocation tagging is utilized - tagging would need to be handled in a manner similar to that described under alternatives 4 and 5, or a shift to an electronic tag (e-tag) system (described in Section 6.0) could be considered.

⁷ Up to 3 percent cost recovery from the ITQ programs could be used to cover the costs associated with the new EM program. In addition, it may be appropriate to consider how cost recovery collects fees; for example, sending bills to the dealers that collect fees on used tags versus billing ITQ individual owners.

5.7 Considered but Rejected from Further Analysis

Allow Trips to Land Both Species under a Combined Trip Declaration

Prior discussions contemplated the creation of a new VMS category to allow for fishing trips to land both species (i.e., surfclam and ocean quahog) under a “combined” or “mixed” category in addition to the single species trip declarations categories currently utilized for VMS. Currently, a trip must be declared under VMS as a surfclam trip or ocean quahog trip indicating which ITQ species is being targeted.

Review of survey information and input from NOAA Fisheries stock assessment expertise and port agents indicated that most trips are mixed with both surfclam and ocean quahog, to some degree. The point of catch monitoring either on board the fishing vessel or within a dealer/processing facility that receives surfclam and/or ocean quahog cages is to determine the catch composition and the extent of mixing. Therefore, pre-identification of a VMS trip that could be anticipated as mixed or not mixed provides no beneficial information. Conditions and species distributions continue to change over time so the composition of the mix will also continue to change with time. Discussions with Office of Law Enforcement staff also highlighted the importance of those primary/intended target species trip declarations to the work they do even if other species are caught. Therefore, a new “combined” or “mixed” VMS category was considered but rejected from further analysis.

Partial Sorting on Vessel and Further Sorting at Dealer

Partial sorting on board the fishing vessel, and then further sorting of cages at the dealer facility was considered but rejected from further analysis. There are issues with tracking and reconciling both the catch on board the vessel with the dealer reports and the ITQ allocation tracking in this fishery. In addition, it is extremely difficult for anyone, including enforcement, to go through the cages once they have been filled – therefore, verification of what constitutes a sorted cage versus an unsorted cage would be nearly impossible to determine.

Port Monitoring

The creation of a new shoreside sampling program at the port with sample sizes adequate to assess catch composition to support the stock assessment was considered but rejected from further analysis. This program could allow for accurate ITQ catch accounting for both surfclam and ocean quahog. Through a carefully designed, representative sampling system, port samplers would need to intercept fishing vessels when they arrive at port with their cages to unload. This could disrupt port and vessel operations. In addition, this does not address the issue of getting information on total catch, including the discarding of non-target clam species at sea which is occurring but not presently reported or recorded in the eVTRs.

6.0 OTHER CONSIDERATIONS (Electronic e-Tag System)

The fishing industry raised the issue of eliminating the physical cage tags for tracking allocation in this fishery in lieu of an e-tag system.

The industry also indicated a desire to be able to track and receive credit for partially filled cages of surfclam and/or quahog during a fishing year or a credit to future fishing years (i.e., not be charged a full 32-bushel cage tag for portions of cages that are not the intended target clam species). This approach is problematic given the current tracking capabilities within the various GARFO databases and how they relate to one another. Even tracking smaller tag increments as suggested in the alternatives 3-6, would require substantial database modification to implement and track ITQ landings and allocation by tag number.

The NOAA Southeast Regional Fisheries Office (SERO) underwent a major data modernization process and has been shifting towards enhanced tracking capabilities for their LAPP databases. SERO has built and maintained an electronic catch share program that uses a relational database backend structure with a web-based front-end platform. The underlying back-end structure developed for the Gulf of Mexico IFQ Red Snapper and Grouper-Tilefish programs, was also successfully modified to account for the needs of the Highly Migratory Species' Bluefin Tuna Individual Bycatch program and a pilot study for the Gulf of Mexico Headboat Collaborative program. Each of these programs had unique and different requirements from the base model, but modifications were made to suit the needs of each program. This approach is also being considered as a starting point for an electronic Wreckfish ITQ program in the SERO region. One of the key aspects of the base catch share electronic system method is a direct connection and relationship with the permits managed by SERO. The current catch share system streamlines access with the permits database. The ability to link with the permits database could be used to create a more efficient method to track participation in the program, link participant attributes with transactions, and link shareholders directly to landings and the vessels used to land the fish. Another benefit of an electronic system would be the ability to increase the efficiency and timeliness of program resource distributions and transactions (i.e., such as transfers). Enforcement of the program could also be improved by using an electronic online system. Other catch share programs in the Southeast region use the electronic nature of the program to send notifications to enforcement about landings.

While the initial creation of such a system may create a short-term administrative burden on NOAA Fisheries, the benefits of such a system are evident. The initial set-up costs for the SERO system were very high (over \$1 million). However, a data modernization approach if pursued at GARFO could be utilized for multiple LAPP fisheries and could have other potential benefits for other fisheries as well through careful development. Managing the SERO catch share programs post implementation requires approximately 4 full-time staff (2.5 Staff Overall plus 1 Staff for analysis at SERO; 0.5 NEFSC staff for Wreckfish Program which is very small). All the catch share program fisheries in the SERO region collect the maximum cost recovery amount (3 percent) for each of these fisheries to support their management programs.

The Council could request GARFO to develop a similar system for the surfclam and ocean quahog ITQ fisheries.

7.0 EXPECTED IMPACTS

The following summarizes impacts on those physical, biological, and human components of the environment if any of the action alternatives considered in this document were to be implemented. The occurrence of two clam species (surfclam and quahog) in fishing vessel catch has created challenges relative to catch monitoring (both landings and discards) and ITQ allocation tracking, as well as enforceability of regulations. The following describes impacts relative to:

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

As well, this section describes how well the alternative addressed:

- Catch monitoring and verification of the data,
- ITQ allocation tracking, and
- Enforceability.

For reference, the alternatives described in section 5.0 are summarized below Box ES-2. The alternatives presented in this document (i.e., to modify species separation requirements) are not expected to have impacts on certain aspects of the overall prosecution of these fisheries. They are not expected to impact current overall catch limits and landing levels for the targeted species in the short-term or fishing methods while the hydraulic clam dredge gear is being deployed to catch surfclam and ocean quahog on the seafloor. However, while the overall scale and scope of these two fisheries may not change, there may be impacts to the distribution of the fishery because of the alternatives selected; however, those impacts are difficult to assess. Industry members have indicated they try to avoid mixed beds of surfclam and ocean quahog because the processors only process one species at a time. Surfclam-only beds are more likely to occur closer to shore. However, as nearshore surfclam beds have been fished down and surfclam beds have shifted to deeper, cooler habitat the fishery is increasingly fishing deeper to obtain higher surfclam landings per unit effort. There is no data to assess how and if each processor/vessel fishing group (with different facilities and vessel configurations) are working to avoid the mixed catch, how they assess tradeoffs between maintaining target species landings per unit effort rates and dealing with a mixed catch, how much sorting and discarding of non-targets is happening on the vessel versus in the processing facility, and how those behaviors have changed or may continue to change over time.

The following alternatives are not expected to change impacts to habitat. Ongoing prosecution of the surfclam and ocean quahog fisheries has minor negative impacts on habitat, including Essential Fish Habitat (EFH). No additional habitat impacts are expected because of any of the following alternatives. In addition, there have never been documented interactions between protected species (Endangered Species Act (ESA)-listed and/or Marine Mammal Protection Act (MMPA) protected species) and the primary gear type (i.e., clam dredge) used to prosecute the fisheries; for this reason, no protected species impacts are expected from any of the alternatives below.

The following alternatives are expected to impact other aspects of the environment such as the target species, and human communities, including aspects of on-vessel fishing and shoreside operations and are noted in the discussion that follows.

Box ES-2. Brief Description of Alternatives.

Alternatives	Brief Description of Alternatives
<p>Alternative 1 (No Action/<i>Status Quo</i>)</p>	<p>No changes would be made to the current regulations for surfclam and ocean quahog.</p>
<p>Alternative 2 (Require On board Sorting, No Mixing in Cages)</p>	<p><u>Explicitly</u> require on board sorting and reporting of all discards.</p>
<p>Alternative 3 (At-Sea Catch Monitoring)</p>	<p>Implement on board sampling protocols developed by NOAA Fisheries to determine catch and discards on board the fishing vessel for each monitored trip.</p>
<p>Alternative 4 (Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer)</p>	<p>Require full retention of both clam species on board the fishing vessel. Sorting would occur at the dealer.</p>
<p>Alternative 5 (Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer with Shoreside Catch Monitors)</p>	<p>Require full retention of both clam species on board the fishing vessel. Sorting would occur at the dealer. Catch monitors would be required in the dealer.</p>
<p>Alternative 6 (Require Electronic Monitoring, Allow for Mix in Cages)</p>	<p>Allow the mixing of both clam species within the cages with the implementation of a new onboard EM program to assess catch composition.</p>

7.1 Alternative 1 - No Action/Status Quo

This alternative would fail to address the issue of mixed catches in these fisheries that was brought to the Council’s attention by fishing industry members.

Some industry members have indicated that this creates an issue with compliance and have noted that while they are presently avoiding fishing in areas that produce high levels of mixed catches, there is the potential that the extent of mixing and overlap of both surfclam and ocean quahog will continue to increase as water temperature continues to rise and species distributions continue to shift. At present, discarding of non-target clams (quahog on surfclam trips and vice versa) on board

fishing vessels and disposal of them at the processing facilities is occurring, but are not being reported or recorded as part of the catch. Industry has indicated this is mainly an issue of ocean quahog being discarded on surfclam trips, because as surfclam have shifted deeper they are overlapping more with quahog habitat and there are fewer high-density surfclam only clam beds available to fish on. The failure to document and collect data on the extent of mixed clam catches on board vessels would continue to degrade the data collected to support the management of the surfclam and ocean quahog ITQ fisheries.

Catch monitoring and verification of the catch data would be poor because of the failure to collect consistent information about the catch of both clam species (i.e., rated as low quality). It was assumed to date that 32-bushel cages of a specific target clam species being landed on the vessel (reported on eVTRs) could be verified against dealer reports reporting purchases of 32-bushels cages of that target species; however, this is not the case if an unknown mix is being landed. While allocations are being tracked using the ITQ tag-based system, it is difficult to know exactly how much of the content within each cage contains a mix, and this could result in under or over-reporting of landings. As such the quality of individual clam species allocation tracking may be low depending on how much mix is occurring – and how successful members of the industry are at avoiding this mix given the current separation requirements. The ability to enforce the catches of surfclam and quahog would be rated as low under this alternative. In other fisheries with mixed catches, catch can be visually validated by enforcement when separated. However, in the surfclam and ocean quahog fisheries, while a total number of cages are visible and tagged, enforcement cannot visually estimate the cage contents and composition, nor can these standardized 32-bushel cages be dumped easily once filled given their substantial size and weight. Enforcement has for decades relied on the assumption that fishing trips are single species and tagged as such.

Unmonitored and potentially increased mortality could have impacts on the sustainability of these clam species over time. The mortality rates for discarded clams would be expected to be 100 percent (Hennen, Dan, NMFS/NEFSC, Personal Communication January 16, 2024). Therefore, there could be long-term slight-negative to negative biological impacts to surfclam and/or ocean quahog stocks over time if increasing discarding and disposal results in increasing mortality on the resource. In addition, although it was noted that mainly quahogs are being discarded, as ocean quahog only beds are fished down there is potential for increased surfclam discarding as well on trips targeting ocean quahog.

Further increases in mixed catches in these fisheries have the potential to increase on board costs by requiring fishermen to undertake more effort to avoid mixed areas, increased voluntary sorting and discarding, or modifications to other practices on board that may slow on board operations, resulting in increased operational costs to land a similar number of clams. Therefore, no action has the potential to result in socioeconomic impacts that range from slight negative at present to negative in the long-term.

7.2 Alternative 2 - Require On board Sorting, No Mixing in Cages

Explicitly requiring sorting and reporting of catch (both landings and discards) would allow for improved monitoring of the catch. These clam fisheries still present challenges in terms of catch verification as enforcement cannot visually estimate the cage contents and composition nor can these standardized 32-bushel cages be dumped easily once filled given their size and weight.

Extensive trucking to processing facilities makes off-site validation challenging for enforcement as the product is often trucked long distances from the port of landings. However, reinforcing the need to both sort and report the total catch and for cage contents on a fishing trip to be the target species (and tagged as such) should produce increased effort to sort and provide more reliable catch information even if verification is difficult. Verification of the catch would still rely on the assumption that after sorting the cages are filled with the target species and that the fishing trip eVTR has accurately captured and quantified any discards that went overboard, and those landings can be reconciled with the dealer reported landings of the target species. As such, the catch monitoring should be moderately improved when compared to the no action as well as the allocation tracking.

Some industry members have indicated they already do some level of voluntary sorting on board the vessel when material travels down the conveyor belt on the deck prior to filling the cages, to remove items such as undesired clam species (current regulations already require the target clam species only in each ITQ tagged cage), rocks, and debris to prevent those from going to the processor/dealer. On board operations may need to slow down for some fishing trips because of the need to slow the conveyor belt to allow better sorting of the clam species and estimation of discards prior to placement of material in cages. As these vessels are already limited in terms of numbers of crew that can be carried on board, it is more likely that operations would slow versus the carriage of additional crew to sort. As such, this alternative may result in increased operating costs for some trips. This would have an impact on some trips more than others, and it will depend on the extent of the mix of surfclam and ocean quahog in the clam beds being fished. Some industry members have indicated that fully sorting on board is not a feasible solution for their industry. Alternative 2 could provide positive impacts as it would allow for improvements in catch accounting that are necessary to manage these ITQ fisheries, as both surfclam and quahog cages on their respective fishing trips would need to be sorted and tagged accordingly and discards reported as required. Alternative 2 is expected to have negative impacts on the human communities, because of the potential for operating costs increases for some fishing trips and for some vessel/processor groups.

7.3 Alternative 3 - At-Sea Catch Monitoring

Implementing an at-sea catch monitoring program would ensure there is a precise and accurate representation of catch to support the stock assessment and provide detailed information to understand the scale and scope of mixing of the catch (including discards going overboard, and the extent of mix within cages), which is presently not available. Current understanding of the extent of mixing includes some survey information on the composition of surfclam and ocean quahog on the seabed (Appendix A), and local knowledge provided by several industry members – although this information varies from some noting a little mixing, others lots of mixing, and differences in terms of where they note the issue is occurring – with some saying it’s more of a southern issue off NJ, and others saying the mixing issue is extensive in New England waters as well. This at-sea data collection would provide high quality information collected during fishing operations for both catch accounting, provide an independent verification of catch to check against dealer reports and improve allocation tracking. This information is critical for a host of applications from assessment to ensuring regulatory compliance. Enforcement could focus on ensuring compliance with the new program and ensuring any other requirements are met.

This alternative is likely to be expensive and would require more extensive development to ensure the program as designed meets its objectives; however, several catch share and other limited access programs around the country with discard issues have implemented similar types of programs (e.g., Northeast Groundfish Catch Share Sectors, West Coast Groundfish IFQ, etc.).

A total of 2,407 surfclam and ocean quahog trips were taken in 2022. If an estimated 50 percent of those total trips were monitored (excluding trips fishing shoreward of 30 m (98 feet)) at a cost of \$800/day per monitor or \$1,400 per trip (based on average trip duration of 1.75 days/trip), resulting in an overall cost of \$1.7 million/per year. This does not include any additional costs that may be associated with administering this type of program. Current costs recovered for these ITQ fisheries vary each year, tending to be around 0.2 percent, and the full 3 percent per year would be about \$1.2 million total.

Because the surfclam and ocean quahog fishery ITQ allocation tracking is complex and there is currently not a system set up for e-tags or electronic boat accounting (as is used in other regions), a system is needed to ensure ITQ quotas for both species are not exceeded during the fishing year and enough ITQ allocation of both species are available on board fishing vessels to tag the cages. This modified system of tagging would require utilization of allocation for both species on trips, potentially creating additional costs for industry to purchase tags. To ensure enough cage tags are available, some entities (e.g., individuals or dealer/processor groups) may need to purchase or lease additional cage tags. Alternative 3 is, however, expected to have neutral overall impacts on human communities. This is because the potential costs associated with purchasing or leasing additional ITQ cage tags would result in revenue gains for other ITQ owners and lessors.

This alternative would also be expected to have positive impacts by providing detailed information on the catch (landings and discards) for both surfclam and quahog, which would support the assessment of the stock and ability to effectively manage these resources sustainably.

7.4 Alternative 4 - Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer

At the dealer facility, each fishing trip would be separated and sorted separately with all non-target clam species volumes sorted and reported for that trip using a standardized protocol to be developed and approved by NOAA Fisheries. Following these protocols should allow for improved monitoring of the catch; however, there would be no source of verification for this information. Vessel trip and dealer reports serve as separate sources of verification for the data – which is sometimes subject to error or misreporting whether intentional or accidental. Typos or other errors in the data frequently happen – an extra zero is added, omitted, etc. In addition, dealer facilities are spatially removed from the point of landing and cages of clams may be stored at the facility for some time period before being processed. This greatly diminishes the potential for enforcement to make an unscheduled visit to witness the catch being sorted.

Industry has indicated that they already sort in the processing facility to ensure the clam meats are not mixed in their products, and because the species are processed separately. Processing operations may need to slow down to allow for sorting and reporting protocols to be followed and to allow for products from individual fishing trips to be sorted separately. Trips must be sorted separately to ensure area-based information for trips can be linked back to the VTR locations for

the stock assessment and to provide information about the distribution of fishing effort and landings by area.

Because the surfclam and ocean quahog fisheries ITQ allocation tracking is complex and there is currently not a system set up for e-tags or electronic boat accounting (as is used in other regions), a system is needed to ensure ITQ quotas for both species are not exceeded during the fishing year and enough ITQ allocation of both species are available on board fishing vessels. This modified system of tagging would require utilization of allocation for both species on trips and include additional costs for industry to purchase tags. Because data indicating lower catch rates for non-target clam species would result in fewer tags of non-targets needed, there would be a very high incentive to discard at sea and not report, to reduce the catch estimates and reduce the costs of purchasing cage tags. This makes requirements for full retention an important component to ensure the catch is being fully accounted for. This modified system of tagging would also require utilization of allocation for both species on trips and include additional costs for industry to purchase tags. To ensure enough cage tags are available, some entities (e.g., individuals or dealer/processor groups) may need to purchase or lease additional cage tags. This would, however, be expected to have neutral overall impacts on the human communities. This is because the potential cost increases associated with purchasing or leasing additional ITQ cage tags will result in revenue gains for other ITQ owners and lessors.

Alternative 4, is therefore expected to have some negative impacts on the human communities, because it may slow processing operations at the dealer/processing facilities, although the impact depends on the extent of mixing in the product brought into the facilities and the extent to which the processor can readily adapt their operation to follow sorting protocols. Some industry members have indicated sorting at the dealer is a feasible solution, and there may be some slight positive improvements in the catch information to support the stock assessment and sustainable management, but with no source of verification for the catch information it would not be as reliable or enforceable as other action alternatives considered.

7.5 Alternative 5 - Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer with Shoreside Catch Monitors

At the dealer facility, each fishing trip would be separated and sorted separately with all non-target clam species volumes sorted and reported for that trip using a standardized protocol to be developed and approved by NOAA Fisheries. A new IFQ catch monitor program would be developed along with other changes to regulations to ensure the surfclam and ocean quahog cages are accurately sorted, volumes reported, and verified. This greatly improves the catch monitoring and allocation tracking in the ITQ fishery and improves the enforceability of the measures.

Industry has indicated that they already sort in the processing facility to ensure the clam meats are not mixed in their products, and because the species are processed separately. Processing operations may need to slow down to allow for sorting and reporting protocols to be followed and to allow for products from individual fishing trips to be sorted separately. Trips must be sorted separately to ensure area-based information for trips can be linked back to the vessel trip report locations for the stock assessment and to provide information about the distribution of fishing effort and landings by area.

This alternative is likely to be expensive and would require more extensive development to ensure the monitoring program meets its objectives. The West Coast Groundfish fishery has implemented a similar type of shoreside IFQ monitoring program that could serve as a model; that program collects the full 3 percent available through cost recovery (i.e., \$1.6 million in 2023).⁸

Because the surfclam and ocean quahog fisheries ITQ allocation tracking is complex and there is currently not a system set up for e-tags or electronic boat accounting (as is used in other regions), a system is needed to ensure ITQ quotas for both species are not exceeded during the fishing year and enough ITQ allocation of both species are available on board fishing vessels. This modified system of tagging would require utilization of allocation for both species on trips and may include additional costs for industry members to purchase or lease tags. Because data indicating lower catch rates for non-target clam species would result in fewer tags of non-targets needed, there would be a very high incentive to discard at sea and not report, to reduce the catch estimates and reduce the costs of purchasing cage tags. This makes requirements for full retention an important component to ensure the catch is being fully accounted for. This modified system of tagging would also require utilization of allocation for both species on trips and include additional costs for industry to purchase tags. To ensure enough cage tags are available, some entities (e.g., individuals or dealer/processor groups) may need to purchase or lease additional cage tags. This would, however, be expected to have neutral overall impacts on the human communities. This is because the potential cost increases associated with purchasing or leasing additional ITQ cage tags will result in revenue gains for other ITQ owners and lessors.

Alternative 5, is therefore, expected to have negative impacts on the human communities, because it may slow processing operations at the dealer/processing facilities, although the impact depends on the extent of mixing in the product brought into the facilities and the extent to which the processor can readily adapt their operations to follow sorting protocols and integrate the work of the catch monitors. By having standardized equipment and catch monitoring protocols, overseen and verified by a catch monitor, there would be positive improvements in the catch information to support the stock assessment and sustainable management. This approach would also be more enforceable than not having a monitor present.

7.6 Alternative 6 - Require Electronic Monitoring to Assess Catch, Allow for Mix in Cages

Under alternative 6, the mixing of both clam species within the cages would be permitted with the implementation of a new on board EM program to assess catch composition. Full retention of both clam species on board the fishing vessel once the dredge material has moved through the shaker would be required. This would allow for more accurate ITQ catch accounting for both surfclam and ocean quahog as the technology would be used to electronically quantify the catch of the two clam species on trips that either target surfclam or ocean quahog. This could also potentially provide for high quality tracking of allocation use and provide for a separate verification of catch relative to what is reported in dealer reports, as the contents of the clam cages would be analyzed

⁸ The West Coast Groundfish Trawl Rationalization Program consists of three sectors from which costs are recovered: the Shorebased IFQ Program, the Mothership Coop Program, and the Catcher/Processor Coop Program. The most analogous program to this alternative is the Shorebased IFQ Program. The Shorebased IFQ Program fee calculation to determine the 2023 fees for this program exceeded the 3 percent (i.e., at 3.5 percent). Therefore, the Shorebased IFQ Program recovered the full 3 percent in 2023 of \$1.6 million to support this program (see [Cost Recovery Report](#)).

on the vessel. Enforcement could focus on ensuring the EM system is operational and that all the retained catch went through it, as well as ensuring any other requirements are met.

Because the surfclam and ocean quahog fisheries ITQ allocation tracking is complex and there is currently not a system set up for e-tags or electronic boat accounting (as is used in other regions), a system is needed to ensure ITQ quotas for both species are not exceeded during the fishing year and enough ITQ allocation of both species are available on board fishing vessels. This modified system of tagging would require utilization of allocation for both species on trips and include additional costs for industry to purchase tags. Because data indicating lower catch rates for non-target clam species would result in fewer tags of non-targets needed, there would be a very high incentive to discard at sea and not report, which is why it is important that the EM camera placement be carefully considered. This modified system of tagging would also require utilization of allocation for both species on trips and could include additional costs for industry to purchase tags. To ensure enough cage tags are available, some entities (e.g., individuals or dealer/processor groups) may need to purchase or lease additional cage tags. This would, however, be expected to have neutral overall impacts on the human communities. This is because the potential cost increases associated with purchasing or leasing additional ITQ cage tags will result in revenue gains for other ITQ owners and lessors. An e-tag system could also be considered over the longer term as described under 5.7 which would also carry potential costs to NOAA Fisheries.

Existing electronic recording technology may be easily adapted to be applied to this fishery and EM approaches could support large-scale, ongoing data collection on catch of both surfclam and ocean quahog. This could include the collection of length data to support the length-based stock assessment, while reducing the need for length sampling by port samplers. While there could be long-term cost advantages to utilizing EM technology, and it may enhance industry adaptability to the clam mixing issue as the climate changes by assisting the industry in assessing mixing levels, there would be some short-term costs to development and implementation of such technologies. In addition, the technology has not been fully developed so this is a longer-term solution that might take several years to implement. Therefore, it is not a short-term solution. It should be noted that technology development costs may be funded by other groups (those costs may not be imposed on the fishing industry) and likewise there may be incentives or offsets to reduce costs to deploy these types of approaches to the industry. Current costs recovered for these ITQ fisheries vary each year, tending to be around 0.2 percent, and the full 3 percent per year would be about \$1.2 million total. While there may be costs associated with implementing EM technology borne by deploying the new technology to the industry (i.e., slight negative to negative), the long-term benefits that could be realized through implementation may be positive.

Appendix A

Co-occurrence of Atlantic surfclam and ocean quahog in the NEFSC Clam Survey and SCMFIS Survey

NEFSC Clam Survey

Warming oceans have led to shifts in Atlantic surfclam distribution (Hoffman et al., 2018). In general, Atlantic surfclam in the southern area (S. Virginia to S. New England) are shifting to deeper water (Figure 1). This has in turn, led to more overlap in habitat between Atlantic surfclam and ocean quahog.

In the 2016 stock assessment for Atlantic surfclams (NEFSC, 2016), logistic regression models were used to detect trends in the probability of co-occurrence (surfclams and ocean quahogs taken in the same tow) in NEFSC clam surveys during 1982-2011. Survey data collected after 2011 were not included because they involved different survey gear and because too few survey years were available for independent use. Only data from successful random tows were used. Poorly sampled strata with > 2 missing years were omitted (Figure 2).

Results indicated that the probability of co-occurrence increased over time for the New Jersey (NJ) and Long Island (LI) regions of the southern area. Over the period covered by this analysis (<2012), the two increasing regions, NJ and LI, accounted for approximately 80% of the total landings.

In the years following the end of this analysis, the NEFSC clam survey shifted to a different and far more efficient vessel (2012) and re-stratified (2018). Those two changes make it difficult to directly compare recent years to the previous analysis. Rather than attempt to account for the changes in selectivity and capture efficiency that result from a change in survey vessel, and the spatial biases that result from re-stratification, a separate analysis was developed for recent years.

There have not been enough survey years in the southern area using the new survey vessel to create a meaningful time series. It is, however, possible to make inference based on the magnitude of co-occurrence without reference to trends over time.

All tows from 2012 to 2022 (the last complete year of sampling) were analyzed for catch composition. Tows that caught less than 30 surfclams in five minutes were excluded as these represent densities far below what would be considered economically viable for commercial fishing (Powell, et al., 2015). A tow in which at least 5% of the total catch by number was ocean quahog was considered co-occurrence, and less than that proportion was considered a 'surfclam only' tow. Both

of these values are conservative and could be reduced, which would tend to lead to higher values of co-occurrence in the results.

The three Atlantic surfclam strata with sufficient tows meeting the 30 animals per 5 five minutes criteria were all strata except 7S (Figure 3). The proportion of tows in which co-occurrence was observed ranged between about 0% in 2S and 6S to 100% in 1S, 4S, and 9S. The largest, most productive, and heavily sampled strata, 3S, showed about >50% co-occurrence.

It is worth noting that the areas in which high co-occurrence was observed (3S and 4S) are also the areas where co-occurrence would be expected since these are the deeper Atlantic surfclam strata in which ocean quahogs have traditionally been found. It is however, equally important to note that only three of the six southern area Atlantic surfclam strata (3S, 4S and 5S) had more than a few tows in any survey year that caught more than 30 Atlantic surfclam. These two points reinforce the notion that Atlantic surfclam distribution is shifting into deeper water and that co-occurrence with ocean quahogs is already common and likely to increase as ocean temperatures increase.

SCEMFIS Survey

In the fall of 2021, a team from SCEMFIS partnered with an industry fishing vessel, the F/V Pursuit, to document the extent of this habitat overlap between surfclam and ocean quahog. They took samples in several areas, working through surfclam and ocean quahog habitats, as well as areas of intermingling in between. The team documented what was caught, its species, size, age, and location. After analyzing the data, the team found significant habitat overlap and intermixing between surfclams and ocean quahogs, much more than was expected at the start of the survey.

Figure 5 shows the dark pink boxes oriented inshore are locations where more than 24 of every 25 clams was a surfclam. In most cases, these tows were exclusively surfclam. Note that most of these stations are in the 30-40 m range. The yellow boxes generally on the inshore half of the intervening region are stations where at least 1 ocean quahog was present for every 25 clams, but no more than 12 (a 50:50 split). The brown boxes generally on the offshore half of the intervening region are stations where at least 1 surfclam was present for every 25 clams, but no more than 12 (a 50:50 split). Both of the station types yielding mixed clams occupy a substantial region between 40 and 55 m with the surfclam-rich stations somewhat inshore of the ocean quahog-rich stations.

For more details on the survey and its methods, see <https://scemfis.org/>.

Literature Cited

Hofmann, E. E., Powell, E. N., Klinck, J. M., Munroe, D. M., Mann, R., Haidvogel, D. B., Narváez, D. A., Zhang, X., & Kuykendall, K. M. (2018). An overview of factors affecting distribution of the Atlantic surfclam (*Spisula solidissima*), a continental shelf biomass dominant, during a period of climate change. *Journal of Shellfish Research*, 37, 821-831.

Northeast Fisheries Science Center. 2017. Report of the 61st Northeast Regional Stock Assessment Workshop (61st SAW). a. Atlantic surfclam. Technical Report NEFSC Ref. Doc. 17-05, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543-1026.

Powell, E. N., Klinck, J. M., Munroe, D. M., Hofmann, E. E., Moreno, P. & Mann, R. (2015). The value of captains' behavioral choices in the success of the surfclam (*Spisula solidissima*) fishery on the U.S. Mid-Atlantic coast: a model evaluation. *Journal of Northwest Atlantic Fisheries Science*, 47, 1-27.

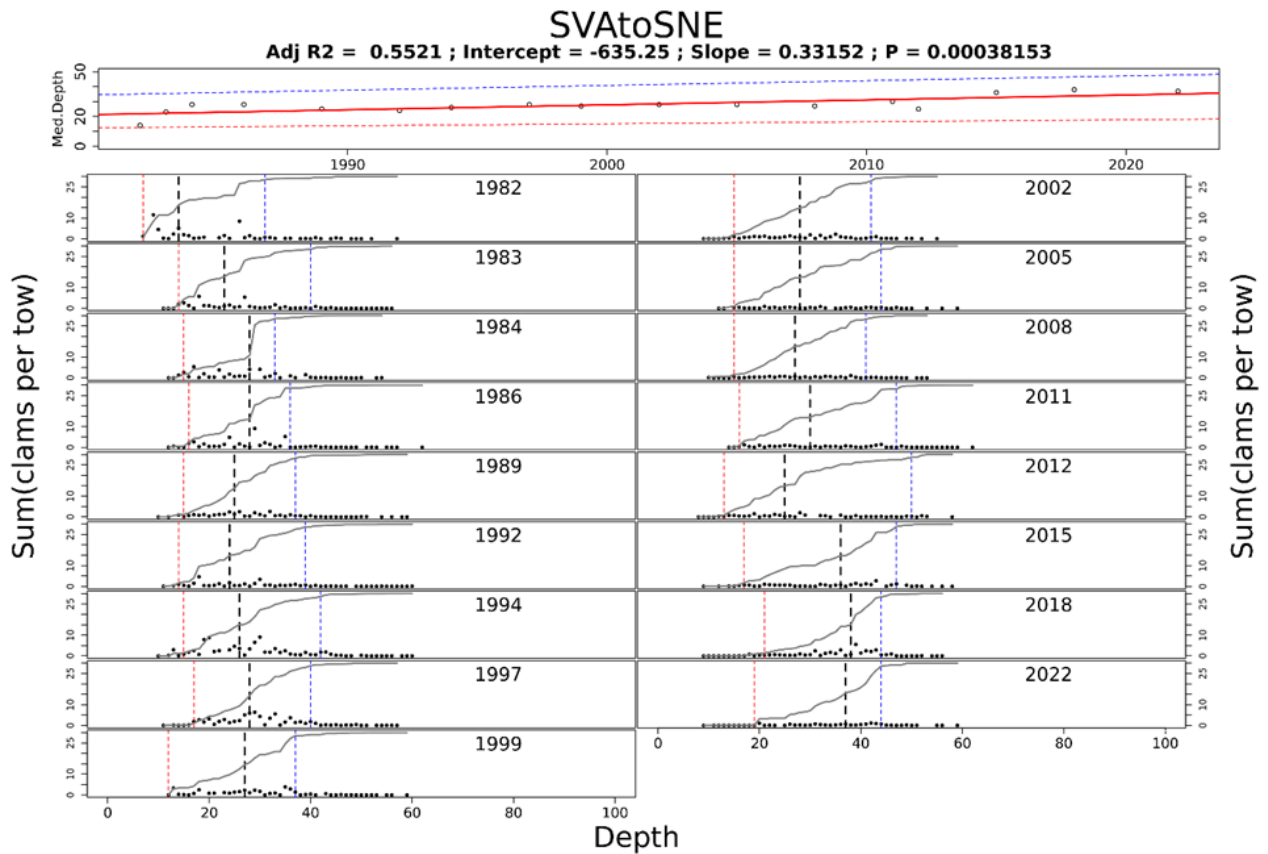


Figure 1. Total surfclam caught at depth by year in SVA to SNE. The points are clams caught aggregated by depth and the gray line is the cumulative sum of clams caught at depth. The black dashed vertical line is the depth at which half of the cumulative total clams caught in that survey were taken. If the black dashed vertical line is further to the right, it indicates that more clams were caught in deeper water in that year. The red and blue dashed vertical lines represent the 5th and 95th percentiles of the cumulative total. The top panel is a simple linear regression of median depth (the black dashed vertical lines in each annual plot) over time. A positive slope indicates that a higher proportion of the total clams in a region were caught in deeper water in recent years.

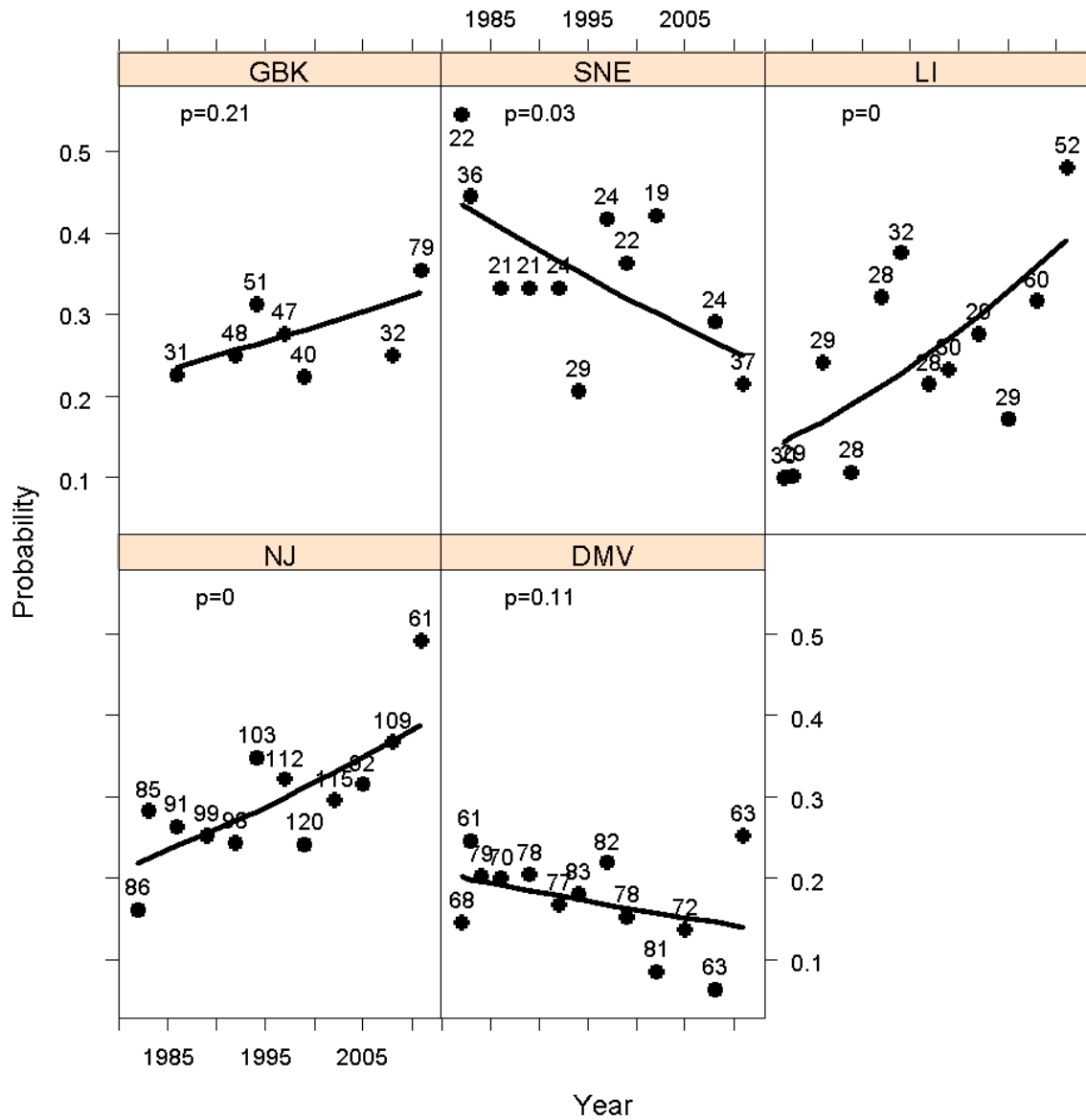


Figure 2. Trends in co-occurrence of surfclam and ocean quahog by region with p-values from a logistic regression (top of each panel) and sample sizes in each year.

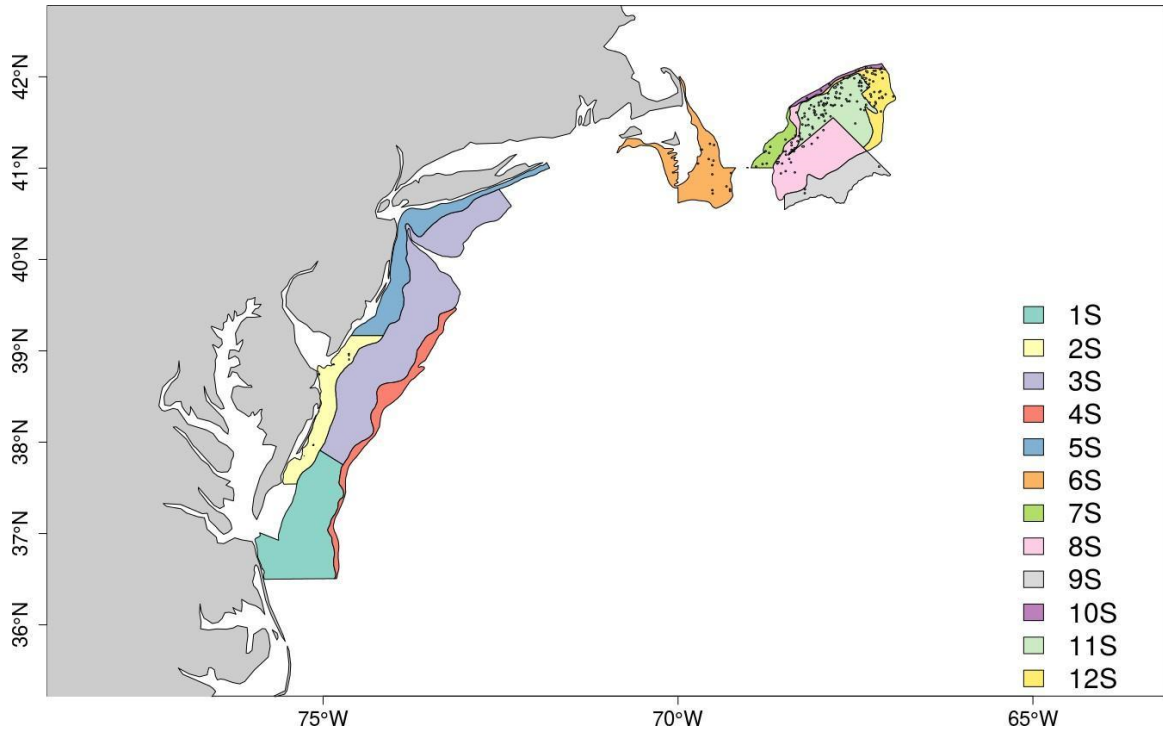


Figure 3. Atlantic surfclam strata used in the NEFSC clam survey.

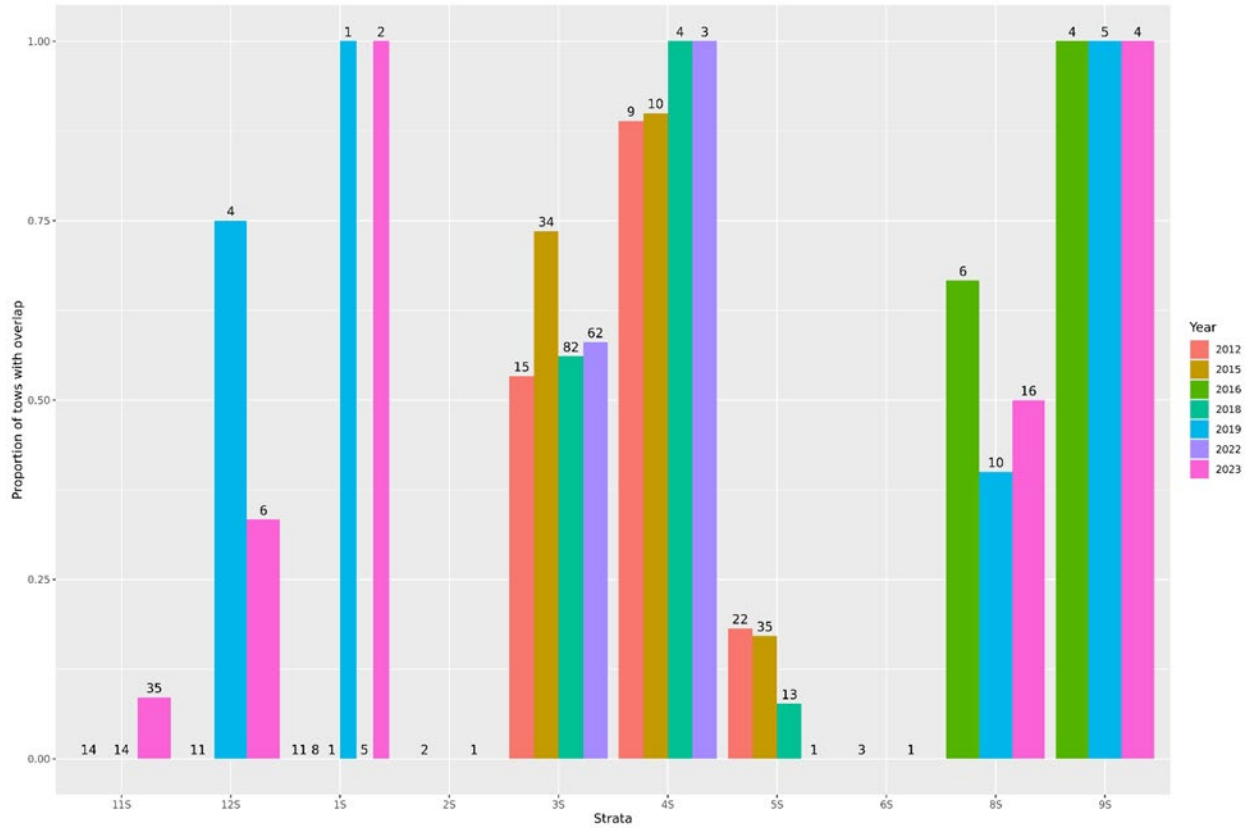


Figure 4. Proportion of all tows with 30+ total Atlantic surfclam containing at least 5% ocean quahog by number. Sample sizes are printed above each bar. Other strata in the southern area did not have sufficient tows that captured more than 30 surfclam to be included in this analysis.

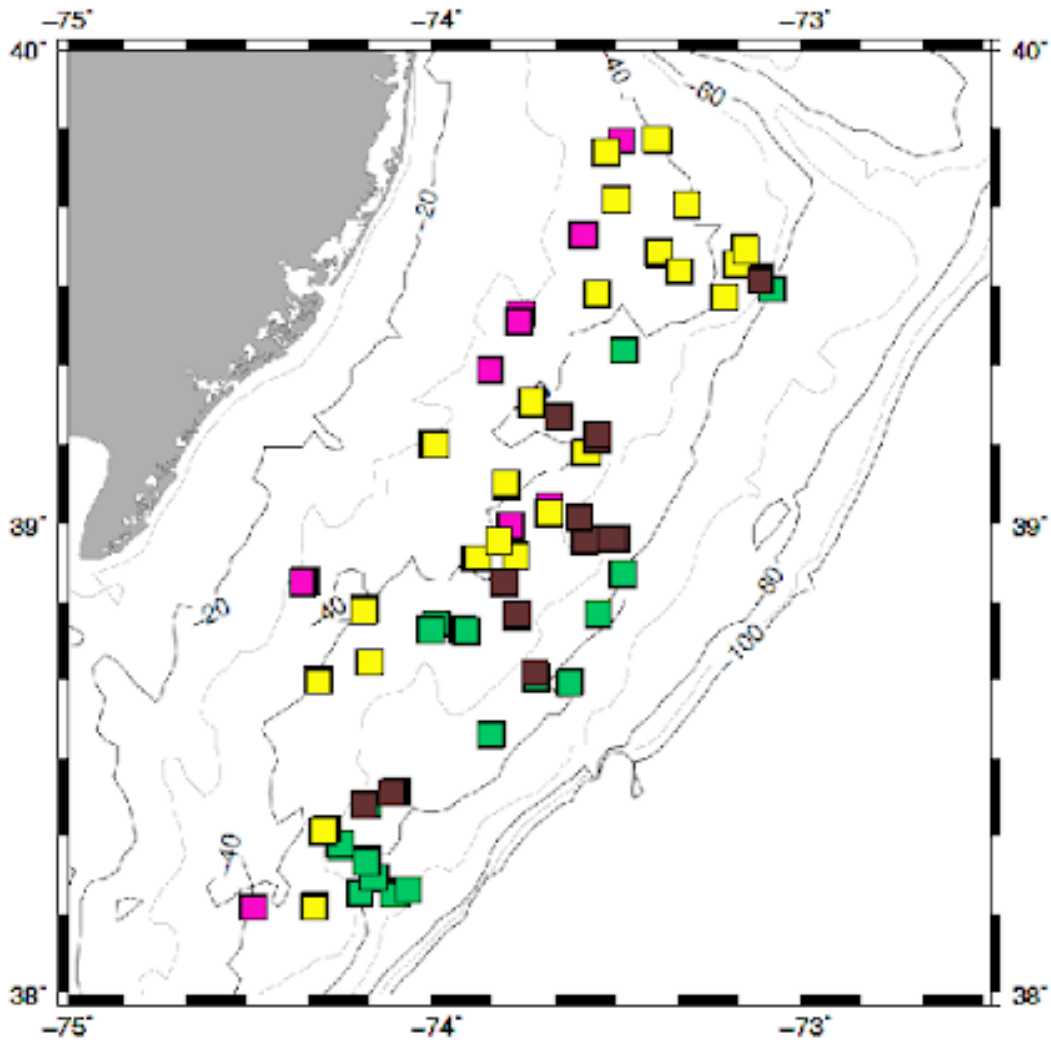


Figure 5. Locations sampled and catch characteristics. Dark pink boxes show locations where >24 of 25 clams were surfclams. Green boxes show locations where >24 of 25 clams were ocean quahogs. Yellow boxes show locations where at least 1 in 24 clams, but less than 12 in 24 were ocean quahogs. Brown boxes show locations where at least 1 in 24 clams, but less than 12 in 24 were surfclams.