February 2024 Council Meeting

Tuesday, February 6 – Wednesday, February 7, 2024

The Westin Arlington Gateway
F. Scott Fitzgerald Ballroom
(801 North Glebe Road, Arlington, VA 22203; (703) 717-6200)
or via Webex webinar

This meeting will be an in-person meeting with a virtual option. Council members, other meeting participants, and members of the public will have the option to participate in person at The Westin Arlington Gateway or virtually via Webex webinar. Webinar connection instructions and briefing materials will be available at: https://www.mafmc.org/briefing/february-2024.

Tuesday, February 6th

10:00 a.m. – 12:00 p.m.	**Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment** – Review and approve Public Hearing Document	**(Tab 1)**
12:00 p.m. – 1:30 p.m.	**---------- LUNCH ----------**	
1:30 p.m. – 4:00 p.m.	**Business Session**	
	Executive Director's Report – Dr. Chris Moore	**(Tab 2)**
.	**Organization Reports:** – NOAA Fisheries Greater Atlantic Regional Fisheries Office, NOAA Fisheries Northeast Fisheries Science Center, NOAA Office of General Counsel, NOAA Office of Law Enforcement, US Coast Guard	
	Liaison Reports: – New England Council, South Atlantic Council	**(Tab 3)**
	Other Business and General Public Comment	
4:00 p.m. – 4:15 p.m.	**Briefing Book Tutorial**	
4:15 p.m. – 5:00 p.m.	**Legal Review, Financial Disclosure and Recusal Training – John Almeida, NOAA Fisheries General Counsel**	**(Tab 4)**

Wednesday, February 7th

9:00 a.m. – 11:00 a.m.	**Offshore Wind Updates** – Updates from the Bureau of Ocean Energy Management – Updates from the state working group on a fisheries compensation fund administrator – Updates from offshore wind project developers - Ørsted - Vineyard Wind - Kitty Hawk Wind - Community Offshore Wind	**(Tab 5)**
11:00 a.m. – 12:00 p.m.	**Black Sea Bass Assessment Overview – Larry Alade, Kiersten Curti, NEFSC** – Overview of recently completed Research Track stock assessment	**(Tab 6)**
12:00 p.m. – 1:30 p.m.	**---------- LUNCH ----------**	
1:30 p.m. – 3:00 p.m.	**Sturgeon Framework** – Review progress on joint Mid-Atlantic/New England Council action to reduce Atlantic sturgeon interactions in the monkfish/dogfish gillnet fisheries – Approve final packages of alternatives	**(Tab 7)**
3:00 p.m. – 4:00 p.m.	**Northeast Fisheries Science Center (NEFSC) White Paper "Draft Proposed Plan for a Novel Industry Based Multispecies Bottom Trawl Survey on the Northeast US Continental Shelf" – Dr. Kathryn Ford, NEFSC** – Overview of the Industry-based survey white paper – Consider next steps	**(Tab 8)**
4:00 p.m. – 5:00 p.m.	**Awards Presentation**	**(Tab 9)**

This meeting will be recorded. Consistent with 16 USC 1852, a copy of the recording is available upon request.

The above agenda items may not be taken in the order in which they appear and are subject to change, as necessary. Other items may be added, but the Council cannot take action on such items even if the item requires emergency action without additional public notice. Non-emergency matters not contained in this agenda may come before the Council and / or its Committees for discussion, but these matters may not be the subject of formal Council or Committee action during this meeting. Council and Committee actions will be restricted to the issues specifically listed in this agenda. Any issues requiring emergency action under section 305(c) of the Magnuson-Stevens Act that arise after publication of the Federal Register Notice for this meeting may be acted upon provided that the public has been notified of the Council's intent to take final action to address the emergency. The meeting may be closed to discuss employment or other internal administrative matters.

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Stock Status of MAFMC-Managed Species

(as of 1/25/24)

SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	Overfished ½ B_{MSY}		
Summer Flounder 	$F35\%_{MSP}$=0.451	54.63 million lbs	Overfishing Not overfished	Most recent management track assessment was 2023.
Scup 	$F40\%_{MSP}$=0.19	86.64 million lbs	No overfishing Not overfished	Most recent management track assessment was 2023.
Black Sea Bass 	$F40\%_{MSP}$=0.46	15.92 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Bluefish 	$F_{35\%SPR}$=0.239	97.15 million lbs	No overfishing Not overfished*	Most recent management track assessment was 2023. *Note: The stock is no longer overfished but has not rebuilt to target reference points and will remain under a rebuilding plan.
***Illex* Squid (short finned)** 	Unknown	Unknown	Unknown Unknown	2022 research track assessment failed, but peer review agreed likely "lightly fished in 2019," though with cautions.
Longfin Squid 	Unknown	46.7 million lbs	Unknown Not overfished	Most recent management track assessment was 2023; not able to determine current exploitation rates.
Atlantic Mackerel 	$F_{40\%}$=0.21	169.9 million pounds	No overfishing Overfished	Most recent management track assessment was 2023.
Butterfish 	F_{Proxy}=2/3M =0.81	43.5 million lbs	No overfishing Not overfished	Most recent management track assessment was 2022.
Chub Mackerel 	At least 3,026 MT of catch per year	At least 3,026 MT of catch three years in a row	No overfishing Not overfished	No stock assessment.

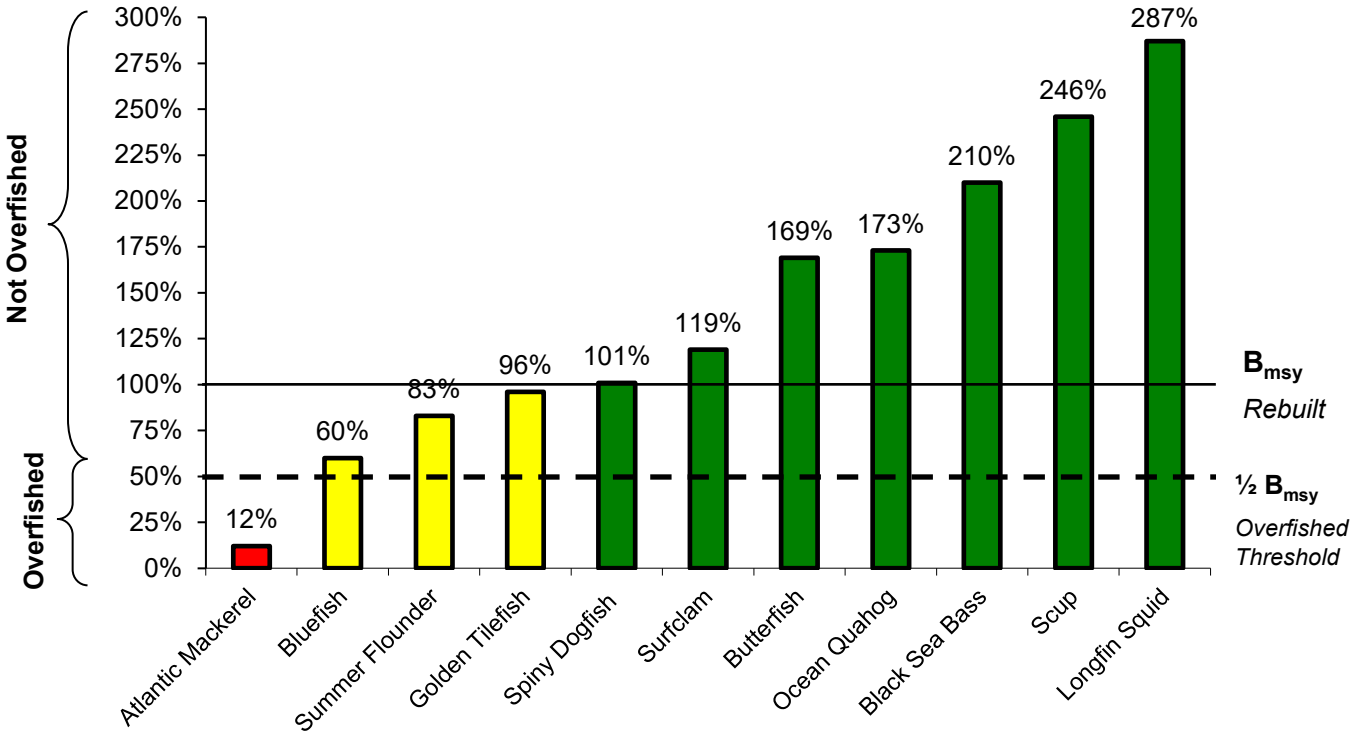
SPECIES	STATUS DETERMINATION CRITERIA		Stock Status	Most Recent Assessment
	Overfishing $F_{threshold}$	**Overfished** ½ B_{MSY}		
Surfclam 	$F/F_{threshold} = 1$ [a]	$SSB/SSB_{threshold} = 1$ [b]	No overfishing Not overfished	Most recent management track assessment was 2020.
Ocean Quahog 	$F/F_{threshold} = 1$ [c]	$SSB/SSB_{threshold} = 1$ [d]	No overfishing Not overfished	Most recent management track assessment was 2020.
Golden Tilefish 	$F_{40\%MSP}$=0.261	12.12 million lbs	No overfishing Not overfished	Most recent management track assessment was 2021.
Blueline Tilefish 	Unknown	Unknown	South of Cape Hatteras: No overfishing Not overfished North of Cape Hatteras: Unknown Unknown	Most recent benchmark assessment was 2017.
Spiny Dogfish (Joint mgmt with NEFMC) 	Fproxy = 0.025	94 million pups spawning output	No overfishing Not overfished	Most recent management track assessment was 2023.
Monkfish (Joint mgmt with NEFMC) 	Unknown	Unknown	Unknown Unknown	Survey biomass trends evaluated in 2022 Management Track Assessment.

SOURCES: Office of Sustainable Fisheries - Status Report of U.S. Fisheries; SAW/SARC, SEDAR, TRAC Assessment Reports, NEFSC Research and Management Track Stock Assessments.

[a] $F_{threshold}$ is calculated as 4.136 times the mean F during 1982 – 2015.
[b] $SSB_{threshold}$ is calculated as $SSB_0/4$.
[c] $F_{threshold}$ is 0.019.
[d] $SSB_{threshold}$ is calculated as $0.4*SSB_0$.

Stock Size Relative to Biological Reference Points

(as of 1/25/24)



Notes:

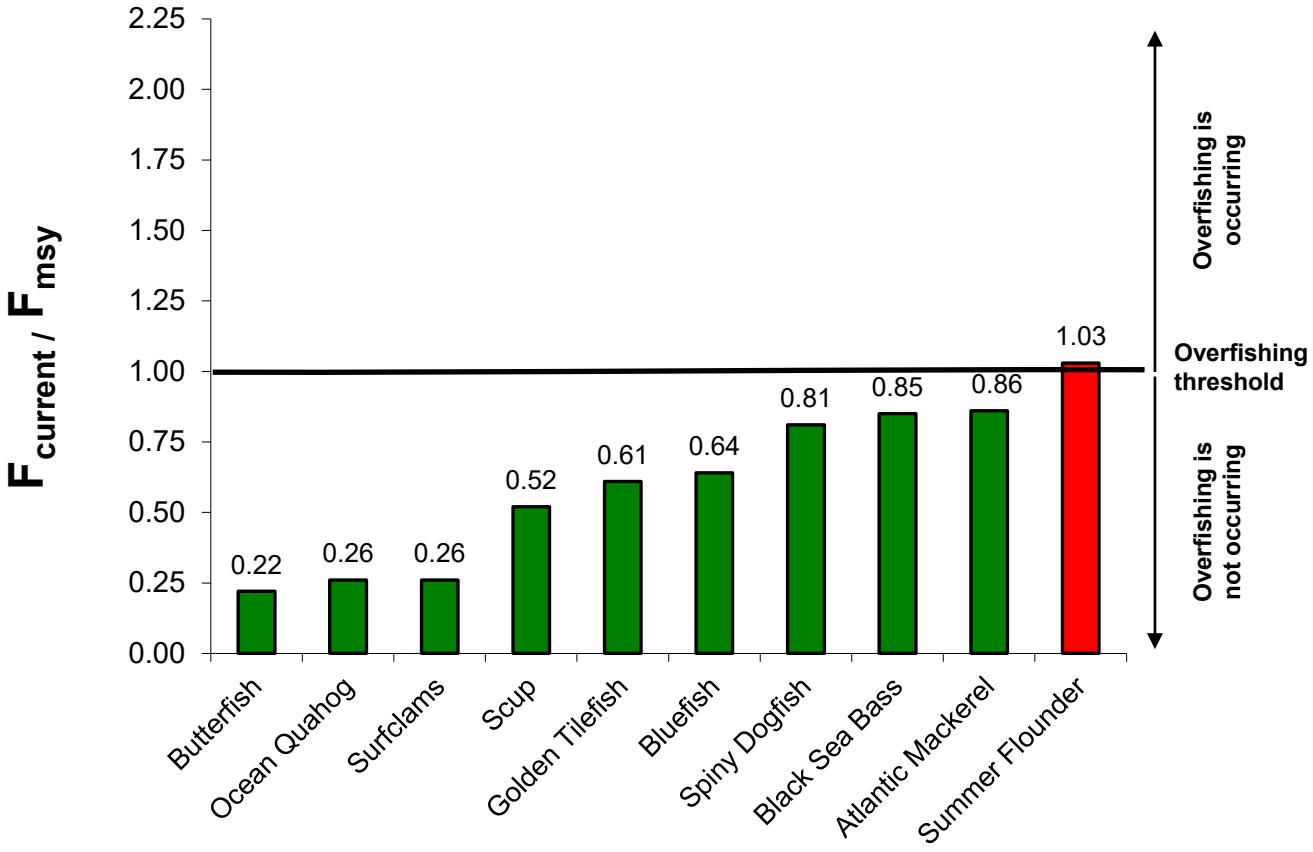
- Unknown B_{msy} - *Illex* squid, monkfish (Northern and Southern Fishery Management Areas), blueline tilefish (North of Cape Hatteras), and chub mackerel.
- Of the 15 species managed by the Council, 7 are above B_{MSY}, 4 are below B_{MSY}, and 4 are unknown.

Year of data used to determine stock size	
Atlantic Mackerel	2022
Black Sea Bass	2019
Bluefish	2022
Butterfish	2021
Golden Tilefish	2020
Longfin Squid	2021-2022 (average)
Ocean Quahog	2019
Spiny Dogfish	2022
Surfclam	2019
Scup	2022
Summer Flounder	2022

MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

Fishing Mortality Ratios for MAFMC-Managed Species

(as of 1/25/24)



Year of data used to determine fishing mortality	
Atlantic Mackerel	2022
Black Sea Bass	2019
Bluefish	2022
Butterfish	2021
Golden Tilefish	2020
Ocean Quahog	2019
Spiny Dogfish	2022
Surfclam	2019
Scup	2022
Summer Flounder	2022

Notes:

- Unknown fishing mortality: *Illex* squid, Longfin squid, monkfish (Northern and Southern Fishery Management Areas), blueline tilefish (North of Cape Hatteras), and chub mackerel.
- Of the 15 species managed by the Council, 9 are below F_{msy}, 1 is above F_{msy}, and 5 are unknown.

Status of Council Actions Under Development

AS OF 1/25/24

FMP	Action	Description	Status	Staff Lead
Summer Flounder, Scup, Black Sea Bass *and* Bluefish	Recreational Measures Setting Process Framework/Addenda	The Recreational Harvest Control Rule Framework modified the process for setting recreational management measures for summer flounder, scup, black sea bass, and bluefish (once bluefish is no longer in a rebuilding plan). The new "Percent Change Approach" will sunset no later than the end of 2025. This action considers a new process to be implemented in time for use in setting 2026 recreational measures. https://www.mafmc.org/actions/rec-measures-framework-addenda	The FMAT/PDT and Council/Commissioner work group are continuing to develop and analyze alternatives and develop the draft framework/addenda document. The Council and Policy Board are tentatively scheduled to meet in August 2024 to approve the final range of alternatives and approve a draft document for public hearings through the Commission process.	Beaty
	Recreational Sector Separation and Catch Accounting Amendment	This amendment considers (1) options for managing for-hire recreational fisheries separately from other recreational fishing modes and (2) options related to recreational catch accounting, such as private angler reporting and enhanced vessel trip report requirements for for-hire vessels.	An FMAT is being formed to begin development of issues for consideration and a draft scoping document. The Council and ASMFC's Policy Board are tentatively scheduled to review a draft scoping document in December 2024.	Dancy/Hart
	Summer Flounder Commercial Mesh Exemptions Framework Meeting #1	This framework adjustment will address several issues related to the summer flounder commercial fishery, specifically: To consider moving the western boundary of the Small Mesh Exemption Area; to clarify the regulatory definition of a flynet; and to ensure meaningful and effective evaluation criteria for the Small Mesh Exemption Program and the use of the flynet exemption.	An FMAT/PDT for this action is being formed. Framework meeting #1 is scheduled for April 2024.	Dancy

FMP	Action	Description	Status	Staff Lead
Surfclam and Ocean Quahog	Surfclam and Ocean Quahog Species Separation Requirements Amendment	As surfclams have shifted toward deeper water in recent years, catches including both surfclams and ocean quahogs have become more common. Current regulations do not allow surfclams and ocean quahogs to be landed on the same trip or in the same tagged cage. The Council is developing and Amendment to consider changes to species separation requirements in these fisheries. In addition, staff/NEFSC are exploring longer term solutions to catch monitoring through an electronic monitoring project on the clam survey. https://www.mafmc.org/actions/scoq-species-separation	The Council will review a draft public hearing document at the February 2024 Council meeting.	Coakley/ Montañez
Omnibus	Omnibus Essential Fish Habitat Amendment	This action is an opportunity to utilize the best available fish habitat science to improve EFH designations and support the Council's fish habitat conservation efforts while supporting the EFH consultation process. The consultation process plays an important role in addressing the impacts of non-fishing projects (such as wind energy projects) on fish habitat. This action will concurrently conduct the 5-year EFH review required under the Magnuson Stevens Act while amending fishery management plans for the Council, as needed. https://www.mafmc.org/actions/omnibus-efh-amendment	An FMAT was formed in January 2023. The FMAT will begin the EFH Review and development work for EFH and HAPC designations alternatives. The EOP Committee and Advisory Panel will meet to review technical approaches being considered in the first half of 2024. The Council is scheduled to review a draft public hearing document in October 2024.	Coakley/Kentner
Dogfish and Monkfish	Framework to Reduce the Bycatch of Atlantic Sturgeon	This joint action was initiated due to the 2021 Biological Opinion (BiOp) that considered the effects of ten FMPs on ESA listed species. The BiOp requires that sturgeon bycatch be reduced in federal large mesh gillnet fisheries, however it does not prescribe specific measures or a target percentage of bycatch reduction. https://www.mafmc.org/actions/sturgeon-bycatch-framework	Initiated in December 2022. NEFMC and MAFMC staff are co-leading the FMAT/PDT. The Councils approved a general range of alternatives in Fall 2023. Councils are reviewing alternative packages in February 2024. AP and Committee meetings are scheduled for March 2024. Final action is scheduled for April 2024.	Didden/Cisneros

Timeline and Status of Recent MAFMC Actions and Amendments/Frameworks Under Review

As of 1/25/24

The table below summarizes the status of actions after they have been approved by the Council. For information about the status of Council actions under development, please see the document titled "Status of Council Actions Under Development."

Title	Action Number	Council Approval	Initial Submission	Final Submission	NOA Published	Proposed Rule	Approval/ Disapproval Letter	Final Rule	Regs Effective	Notes
Black Sea Bass Commercial State Allocation Amendment	SFSBSB Amd 23	8/4/21	11/19/21	9/14/22	5/4/23	5/15/23	8/2/23			EA updated July 2023 only for ESA section due to change in sturgeon info.
Illex Vessel Hold Capacity Framework		10/3/23	NA	NA						NMFS GARFO determined that this qualifies for a NEPA "categorical exclusion." Staff is awaiting requests from GARFO RE: any supplemental documentation.

Timeline and Status of Current and Upcoming Specifications for MAFMC Fisheries

As of 1/25/24

Current Specifications	Year(s)	Council Approval	Initial Submission	Final Submission	Proposed Rule	Final Rule	Regs Effective	Notes
Golden Tilefish	2022-2024	8/11/21	10/7/21	4/22/22	9/14/22	11/10/22	11/9/22	
Blueline Tilefish	2022-2024	4/7/21	10/20/21	5/5/22	8/2/22	11/3/22	12/5/22	
Surfclam and Ocean Quahog	2021-2026	8/12/20	9/2/20	2/24/21	2/17/21	5/13/21	6/14/21	
Longfin Squid	2024-2026	8/10/23	10/12/23					SIR (near status quo) packaged with Illex, awaiting edits
Butterfish	2023-2024	6/8/22	9/8/22	2/17/23	3/7/23	7/27/23	7/27/23	
Illex Squid	2024-2025	4/5/23	10/12/23					SIR (near status quo) packaged with longfin, awaiting edits
Atlantic Mackerel (including RH/S cap)	2024-2025	8/10/23	1/3/24					
Chub mackerel	2023-2025	6/8/22	9/8/22	2/17/23	3/7/23	7/27/23	7/27/23	
Bluefish	2024-2025	8/9/23	10/6/23	11/16/23	11/16/23	1/2/24	1/1/24	
Summer Flounder and Scup	2024-2025	8/8/23	10/6/23	11/30/23	11/17/23	12/21/23	1/1/24	
Black Sea Bass	2024	8/8/2023	10/6/2023	12/3/2023	11/17/2023	12/21/2023	1/1/2024	
Spiny Dogfish	2024	12/13/23						

Recreational Management Measures

Current Management Measures	Year(s)	Council Approval	Initial Submission	Final Submission	Proposed Rule	Final Rule	Regs Effective	Notes
Summer flounder rec measures	2024	12/12/23	1/16/24					
Black sea bass rec measures	2024	12/12/23	1/16/24					
Scup rec measures	2024	12/12/23	N/A	N/A	11/17/23	12/21/23	1/1/24	Change to the federal recreational season was analyzed in a separate document prepared by GARFO, and was included in the 2024-2025 specifications rule
Bluefish rec measures	2020-2024	12/13/19	1/23/20	3/19/20	5/25/20	6/29/20	6/29/20	
Blueline tilefish rec measures	2024 and beyond	6/6/23	9/1/23	9/18/23	11/14/23			

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: January 25, 2024

To: Council

From: Jessica Coakley and José Montañez, Staff

Subject: Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment – Draft Public Hearing Document

At this meeting, the Council will review the draft Public Hearing Document for the Atlantic Surfclam and Ocean Quahog (SCOQ) Species Separation Requirements Amendment that has been prepared by the Fishery Management Action Team (FMAT). The Council could consider approving the document, and may choose to select a preferred alternative prior to soliciting additional public input. If approved, Council staff would schedule public hearings and provide notification of an open public comment period, after which comments received would be summarized and provided to the Council for consideration.

The SCOQ Committee and Advisors are scheduled to meet jointly prior to this meeting, on February 5 via webinar, to review the draft Public Hearing Document. A summary of meeting outcomes will be available prior to Council discussion and any outcomes and/or Committee motions will be provided as part of the staff presentation.

SPECIES SEPARATION REQUIREMENTS AMENDMENT

AMENDMENT XX TO THE ATLANTIC SURFCLAM AND OCEAN QUAHOG FISHERY MANAGEMENT PLAN

Public Hearing Document

January 2024

Mid-Atlantic Fishery Management Council

in cooperation with

the National Marine Fisheries Service (NMFS)

Council Address	NMFS Address
Mid-Atlantic Fishery Management Council 800 North State Street, Suite 201 Dover, DE 19901	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 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 XXX 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. **TBD in-person**. (Philadelphia, Pennsylvania).
2. **TBD in person**. **(**Rhode Island or Massachusetts).
3. **Online** webinar.

Written Comments

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

- **Email** to: jcoakley@mafmc.org (use subject "SCOQ Species Separation")
- **Online** at: https://www.mafmc.org/comments/scoq-species-separation
- **Mail** to: Chris 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 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 onboard vessels, an issue raised by 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 has indicated that mixing clam catches makes it difficult to comply with existing management regulations that require only single species declared trips. In fact, the increasing frequency of mixed catches in these fisheries has the potential to impact onboard 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 Individual Transferable Quota (ITQ) programs.

This document details the management alternatives being considered and the impact of those alternatives. How well they address the issues related to reliability and quality of the catch data, accurate allocation tracking, and ability to enforce the requirements and verify the catch are detailed in Box ES-1 below.

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 (l), or an alternative may be much easier to enforce than others and be ranked high (h) 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, the practicability of the alternative is noted in Box ES-1 as well.

Box ES-1. Summary of the species separation requirements alternatives under consideration; High (H), Mod (M), Low (L).

Alternatives	**Brief Description of Alternatives**	Catch Monitoring (H, M, L)	Allocation Tracking (H, M, L)	Enforceability (H, M, L)	Cost ($ to $$$)	Practicability
Alternative 1 (No Action/*Status Quo*)	No changes would be made to the current regulations for surfclam and ocean quahog.	Low	Low	Low	N/A	Industry and the Surfclam and Ocean Quahog Committee have noted that action is needed, and that no action would not address the issue.
Alternative 2 (Require Onboard Sorting, No Mixing in Cages)	Current regulations would be modified to explicitly require onboard sorting and reporting of all discards.	Mod	Mod	Mod	$$	Industry has stated that fully sorting is not a practicable solution for their vessels and/or processor groups.
Alternative 3 (At-Sea Observing and Monitoring of Catch Disposition)	Current regulations would be modified to implement onboard sampling protocols developed by NOAA Fisheries to determine catch and discards onboard the fishing vessel for each monitored trip.	High	High	High	$$$	Other limited access programs with mixed catch/discard issues have similar programs (i.e., Groundfish Catch Share Sectors, Pacific Groundfish), making this a practicable solution.
Alternative 4 (Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer)	Current regulations would be modified to require full retention of both clam species onboard the fishing vessel.	Mod	Mod	Low	$$	Industry has stated that sorting at the dealer is the most practicable for them; however, this is the least enforceable of the options compared to the no action.
Alternative 5 (Require Electronic Monitoring, Allow for Mix in Cages)	Current regulations would be modified to 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.	High	High	High	$$$ to $	Not practicable as a solution in the short-term; this new EM program would require long-term development but could be practicable in the long-term.

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
eVTR	Electronic Vessel Trip Reports
FMAT	Fishery Management Action Team
FMP	Fishery Management Plan
GARFO	Greater Atlantic Regional Fisheries Office
IFQ	Individual Fishing Quota
ITQ	Individual Transferable Quota
MAFMC	Mid-Atlantic Fishery Management Council (Council)
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management 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 ft^3); 1 surfclam bushel = 17 lb meats (1.88 ft^3); 1 ocean quahog bushel = 10 lb meats (1.88 ft^3). Number of bushels divided by 32 = number of cage tags.

3.0 TABLE OF CONTENTS

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 fisheries. This action would amend the FMP and make changes to the regulations to address the issue of mixed catches that are currently occurring onboard clam vessels. Regulations may be modified at various levels to address onboard 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 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 and are not being reported as landings and/or discards consistently 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 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.

4.5 BACKGROUND ON THIS ACTION

Industry representatives recommended that the Council address issues related to the mixing of surfclam and ocean quahog landings in the fishery. The current regulations do not allow for both surfclam and ocean quahog to be landed on the same trip or to be placed in the same cages. Separate trip and cage tagging requirements were implemented as part of the ITQ system to allow landings to be tracked separately, and to eliminate incentives to use less expensive quahog tags for surfclam cages on the same trip. Industry noted that they currently 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. Despite both regulatory and economic incentives to avoid mixed catches, industry has indicated that this issue needs to be addressed through regulation because mixing of these clams is occurring more frequently, and it may become a larger problem in the future due to climate change. For more details on this mixing issue see Appendix A. In addition, 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 – therefore, data is not being collected in a manner consistent with the requirements of these ITQ fisheries. As a result, the Council has prioritized development of this action to address this issue.

The Council was approached by the fishing industry in 2018 and asked to consider an enforcement waiver so that both species could be landed on the same trip and in the same cage. The Council added this issue to its 2020 Implementation Plan that identifies its work priorities. The Council began the process of exploring possible modifications to the species separation requirements in these fisheries in early 2020 with the formation of a Fishery Management Action Team (FMAT). In November 2021, the FMAT provided a discussion paper that presented 9 options that could be further explored as approaches to address this issue to the Committee and Advisory Panel (AP) at a December 6, 2021 meeting. In the meeting summary it was noted that, "members of the AP indicated they were supportive of an approach like Option #3 (Modify Regulations to Require Onboard Sorting and Allow Mixed Trips) as a first step, which would require onboard sorting and separation of clams by species (surfclam or quahog) when cages are filled on board the vessel, and then taking a research and development (R&D) approach to look at other longer-term solutions (like Option #6 or other options that address long-term monitoring)."

Therefore, the Committee passed the following motion by unanimous consent: "I move that the Committee forward the recommendation of the AP and Committee as discussed Dec 6 (i.e., proposal of option 3 [required onboard sorting] and longer-term R&D such as EM type of solution), to the full Council for consideration." At the December 2021 Council Meeting, the Council also passed a similar motion "Move to initiate an Amendment that considers short-term solutions to species separation including white paper option 3. Also request that the Council/NEFSC staff explore the feasibility of longer-term solutions for monitoring (such as electronic monitoring testing on the clam survey)."

In 2022, development continued on an Amendment with 3 action alternatives included; the primary alternative that at the time was supported by Industry members (onboard sorting into cages) and two other potential alternatives to bracket the range of expected impacts and costs for the NEPA analysis (i.e., the development of a shoreside monitoring program and a longer-term solution of electronic monitoring). That document was taken out for public comment in October 2022, and industry members indicated that onboard sorting was not a feasible option nor were other alternatives contained within the action.

In December 2022, the Council reviewed public comments and agreed to postpone final action on the Amendment to allow time for development of additional alternatives. The FMAT met in January 2023 with the Surfclam and Ocean Quahog AP to solicit input on additional alternatives that are summarized here. The FMAT met again in April 2023 with port agents, enforcement experts, and NOAA Greater Atlantic Regional Fisheries Office (GARFO) data management experts (Analysis and Program Support Division) to gather additional input, including taking public comment from a number of industry and AP members.

On September 15, 2023 that summary and other background information were provided to the Surfclam and Ocean Quahog Committee and AP, during a joint webinar meeting summarized here. The Committee did not make any motions during this meeting.

5.0 MANAGEMENT ALTERNATIVES AND EXPECTED IMPACTS

This action considers a range of alternatives to address changes to the species separation requirements in the surfclam and ocean quahog fisheries. 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 of the NEPA 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. This means the current requirements that 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, will remain in place. This alternative assumes that each ITQ tagged cage only contains the target species. Industry has indicated that this creates an issue with compliance, as current regulations do not allow for mixed surfclam and quahog landings and they are finding it difficult to avoid mixed catches.

5.2 Alternative 2 - Require Onboard Sorting, No Mixing in Cages

Under this alternative, changes would be made to the current regulations for surfclam and ocean quahog. On a declared surfclam trip, onboard sorting would be explicitly required to ensure the cages onboard the vessel are filled with surfclam only, and the cages onboard 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, onboard sorting would be required to ensure the cages onboard the vessel are filled with ocean quahog only, and the cages onboard 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. 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 Observing and Monitoring of Catch Disposition

Under this alternative, changes would be made to the current regulations for surfclam and ocean quahog. 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 addition, 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. If funds were not available, the coverage level could be determined to be less by NOAA Fisheries. At-sea monitors would follow onboard sampling protocols developed by NOAA Fisheries to determine catch (both landings and discards) onboard the fishing vessel for each monitored trip.

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.

Those vessels willing to implement an EM/audit model (approved by NOAA Fisheries) could be exempt from carrying an at-sea monitor 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 would estimate the total weight 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.

Exclusions from the monitoring requirement would be permitted for vessels already carrying Northeast Fishery Observer Program (NEFOP) observers.

The Council will 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 target) and the cages would be required to be tagged prior to removal from the vessel, based on the declared target species. Changes may be required to the current ITQ program to account for the amount of non-target discards at-sea and/or brought to shore in the cages given the ITQ for both these fisheries is fully allocated. In addition, a portion of the costs associated with this new program would be recovered through the cost recovery program.

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

Under this alternative, changes would be made to the current regulations for surfclam and ocean quahog. On a declared surfclam or ocean quahog trip, full retention of both clam species on board the vessel once the dredge material has moved through the shaker would be required. All cages onboard the vessel would be tagged based on the target trip species declared (i.e., surfclam or ocean quahog).

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.

Changes may be required to the current ITQ program to account for the amount of non-target discards at-sea and/or brought to shore in the cages given the ITQ for both of these fisheries is fully allocated.

5.5 Alternative 5 - Require Electronic Monitoring, Allow for Mix in Cages

Under this alternative, changes would be made to the current regulations for surfclam and ocean quahog. 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). However, all trips would still be required to declare a VMS surfclam or ocean quahog trip (the intended target) and the cages would be tagged prior to removal from the vessel, based on the declared target species.

New EM regulations 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. To capture the bulk of the catch, full retention of both clam species on board the fishing vessel once the dredge material has moved through the shaker would be required. 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. In addition, a portion of the costs associated with this new program would be recovered through the cost recovery program.

Changes may be required to the current ITQ program to account for the amount of non-target discards at-sea and/or brought to shore given the ITQ for both of these fisheries is fully allocated. In addition, a portion of the costs associated with this new program would be recovered through the cost recovery program.

5.6 Elimination of Physical Tags to Transition to an Electronic (e-Tag) System

The fishing industry raised the issue of eliminating the physical tags for tracking allocation in this fishery in lieu of an electronic tag. The industry also indicated a desire to be able to track and receive credit for partially filled cages of surfclam and/or quahog (i.e., not be charged a full 32-bushel tag for portions of cages that are not the intended target clam species). At present, partial use of tags would be problematic for tracking in the GARFO databases, including the inability to

relate different databases to one another and account for the extensive amount of allocation movement (i.e., leasing and transfers that occur each year), which is unique to the surfclam and ocean quahog ITQ fisheries.

The NOAA Southeast Regional Fisheries Office (SERO) underwent a major data modernization process and has been shifting towards enhanced tracking capabilities for their 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 Individual Fishing Quota (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 (millions of dollars).

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.

5.7 Considered but Rejected from Further Analysis

<u>Allow Trips to Land Both Species under a Combined Trip Declaration</u>

Prior alternatives included the creation of a new VMS category to allow for trips to land both species under a "combined trip" in addition to the single species trip declarations under VMS. Currently, a trip must be declared under VMS as a surfclam trip or ocean quahog trip indicating which species is being targeted. In discussion with Office of Law Enforcement staff, they noted the importance of those trip declarations in terms of noting the intended species target even if

another species was being caught; therefore, this new combined VMS category was considered but rejected from further analysis.

Partial Sorting on Vessel and Further Sorting at Dealer

Partial sorting onboard the vessel, and then further sorting 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 allocation tracking in this fishery. 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/Shoreside Monitoring

The creation of a new shoreside sampling program with sample sizes adequate to assess catch composition to support the stock assessment was considered but rejected from further analysis. This would be a costly endeavor. 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 enter processing dealer facilities to conduct sampling which may interrupt processing and other operations and present other health or safety issues within the facility. 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 catch information.

6.0 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 here in Box ES-2.

Box ES-2. Brief Description of Alternatives.

Alternatives	Brief Description of Alternatives
Alternative 1 (No Action/*Status Quo*)	No changes would be made to the current regulations for surfclam and ocean quahog.
Alternative 2 (Require Onboard Sorting, No Mixing in Cages)	Current regulations would be modified to explicitly require onboard sorting and reporting of all discards.
Alternative 3 (At-Sea Observing and Monitoring of Catch Disposition)	Current requirements would be modified to implement onboard sampling protocols developed by NOAA Fisheries to determine catch and discards onboard the fishing vessel for each monitored trip.
Alternative 4 (Full Retention of Both Surfclam and Ocean Quahog; Sort at the Dealer)	Current requirements would be modified to require full retention of both clam species on board the fishing vessel.
Alternative 5 (Require Electronic Monitoring, Allow for Mix in Cages)	Current regulation would be modified to 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.

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 deeper, 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 the level of impacts to habitat, therefore the surfclam and ocean quahog fisheries would be expected to have minor, negative impacts on habitat, including essential fish habitat (EFH) because of the ongoing prosecution of these fisheries. In addition, there have never been documented interactions between protected species (Endangered Species Act (ESA)-listed and/or Marine Mammal Protection Act (MMPA) protected) 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.

6.1 Alternative 1 - No Action/Status Quo

Under alternative 1 there would be no changes to the current species separation requirements as established in the FMP and regulations. 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.

While industry members have indicated 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 allocation is 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 the allocation tracking may be low depending on how much mix is occurring – and how hard the industry is working to avoid 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 sustainability of these clam species over time. The mortality rates for discarded clams would be expected to be 100 percent (Hennen, 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 the potential for increased surfclam discarding as well.

Further increases in mixed catches in these fisheries have the potential to increase onboard 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 onboard operations, resulting in increased operational costs to land a similar number of clams. Therefore, not taking action has the potential to result in socioeconomic impacts that range from slight negative at present to negative in the long-term.

6.2 Alternative 2 - Require Onboard Sorting, No Mixing in Cages

Under alternative 2, onboard sorting will be explicitly required and discards of clam species, as well as other species are to be reported on eVTRs (as currently required).

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. 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.

Industry has indicated they already do some level of voluntary sorting onboard 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. Onboard 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 may result in increased operating costs for some trips. This will likely only impact some trips, not all vessel/processor groups, and it will depend on the extent to which vessels are fishing in beds with surfclam and ocean quahog co-occurring. Industry members have indicated that fully sorting on board is not a practicable 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.

6.3 Alternative 3 - At-Sea Observing and Monitoring of Catch Disposition

Under alternative 3, 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 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 evaluating fishery management measures and 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 it objectives – however several catch share and other limited access programs around the country with discard issues have implemented similar types of programs (e.g., Groundfish Catch Share Sectors, Pacific Groundfish, etc.) making this a practicable solution.

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 times $1,400 per trip (based on average trip duration of 1.75 days/trip), this would cost $1.7 million/per year. 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 as $1.2 million total.

Alternative 3 is expected to have negative impacts on the human communities, because of the potential for cost increases for processor groups; however, this depends on the extent to which the landings brought to their facility are mixed clam species. 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 will support the assessment of the stock and ability to effectively manage these resources sustainably.

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

Under alternative 4, 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. If protocols are followed, this 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 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 period of time before being processed. This greatly diminishes the potential for enforcement to make an unscheduled visit to witness the catch being sorted.

Industry has already indicated they already sort in the processing facility to ensure the species 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. Alternative 4 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 operation to follow sorting protocols. This may be a practicable 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 information it may not be as reliable as other action alternatives considered.

6.5 Alternative 5 - Require Electronic Monitoring to Assess Catch, Allow for Mix in Cages

Under alternative 5, the mixing of both clam species within the cages would be permitted with the implementation of a new onboard 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 on the vessel. Enforcement could focus on ensuring the EM system is operational and that all of the retained catch went through it, as well as ensuring any other requirements are met.

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 practicable as a solution in the short-term. 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 as $1.2 million total. While there may be costs associated with implementing EM technology borne by deploying the new technology to the industry (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 SCEMFIS 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) have shifted 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 surfclam (NEFSC, 2016), logistic regression models were used to detect trends in the probability of co-occurrence (surfclam and ocean quahog 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 2018 (the last complete year of sampling) were analyzed for catch composition. Tows that caught less than 30 surfclam 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 3S, 4S and 5S (Figure 3). The proportion of tows in which co-occurrence was observed ranged between about 10% in 5S to over 80% in 4S. The most productive and heavily sampled strata, 3S, showed about 50% co-occurrence (Figure 4).

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 quahog have traditionally been found. It is, however, equally important to note that only three of the six southern area Atlantic surfclam strata had sufficiently high densities of surfclam aggregations to warrant inclusion in this analysis. These two points reinforce the notion that Atlantic surfclam distribution is shifting into deeper water and that co-occurrence with ocean quahog 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/.

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Hofmann, E. E., Powell, E. N., Klinck, J. M., 480 Munroe, D. M., Mann, R., Haidvogel, D. B., Narváez, D. A., Zhang, X., & Kuykendall, K. M. (2018). An overview of factors affecting distribution

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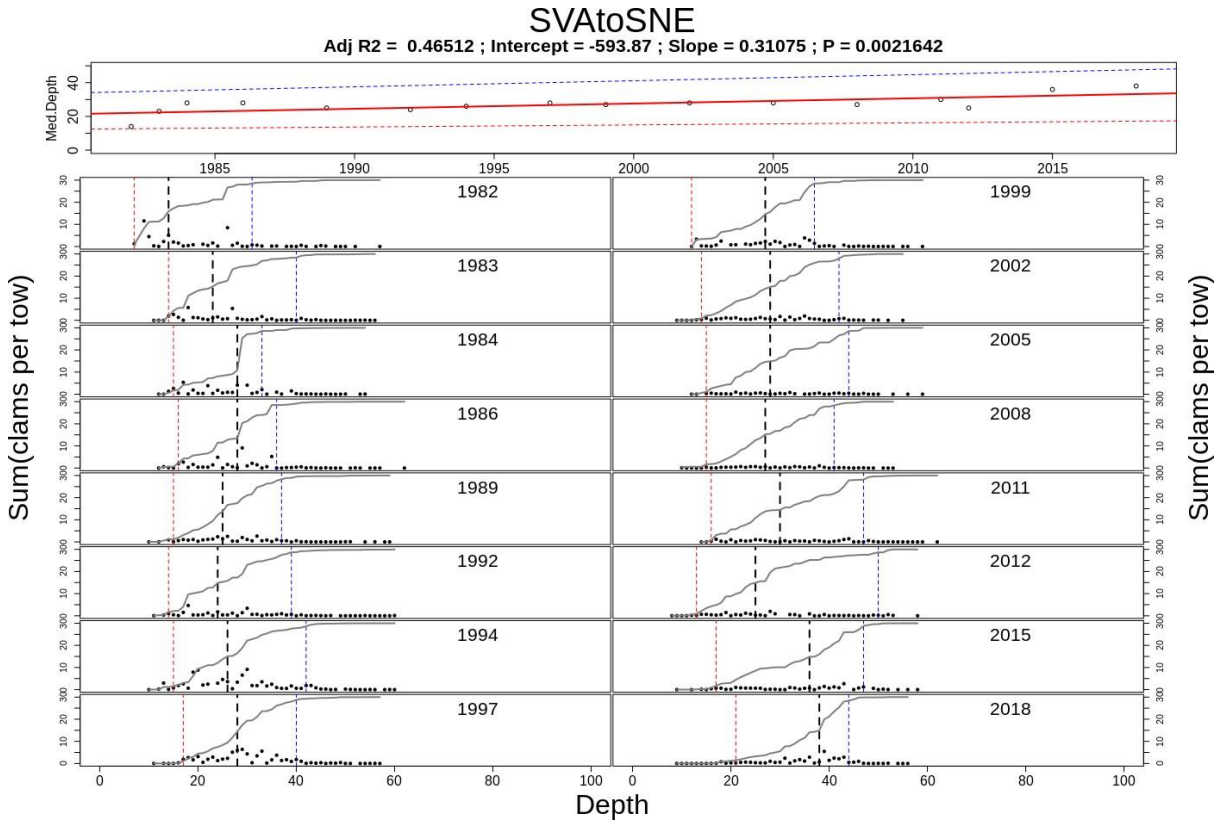


Figure 1. Total surfclam caught at depth by year in SVA to SNE. The points are clams caught aggregated by depth and the gray line is the cumulative sum of clams caught at depth. The black dashed vertical line is the depth at which half of the cumulative total clams caught in that survey were taken. If 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.

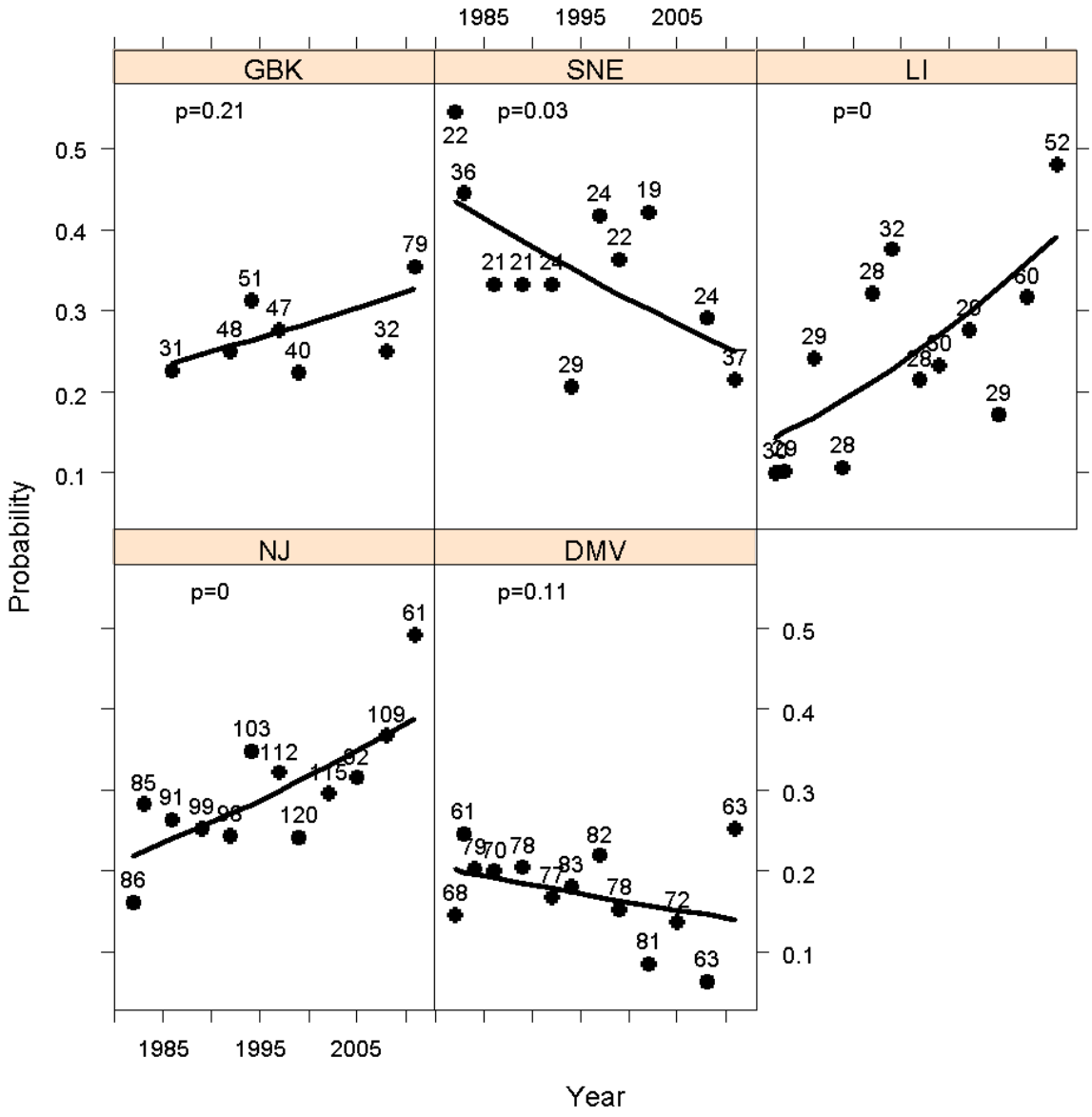


Figure 2. Trends in co-occurrence of surfclam and ocean quahog by region with p-values from a logistic regression (top of each panel) and sample sizes in each year.

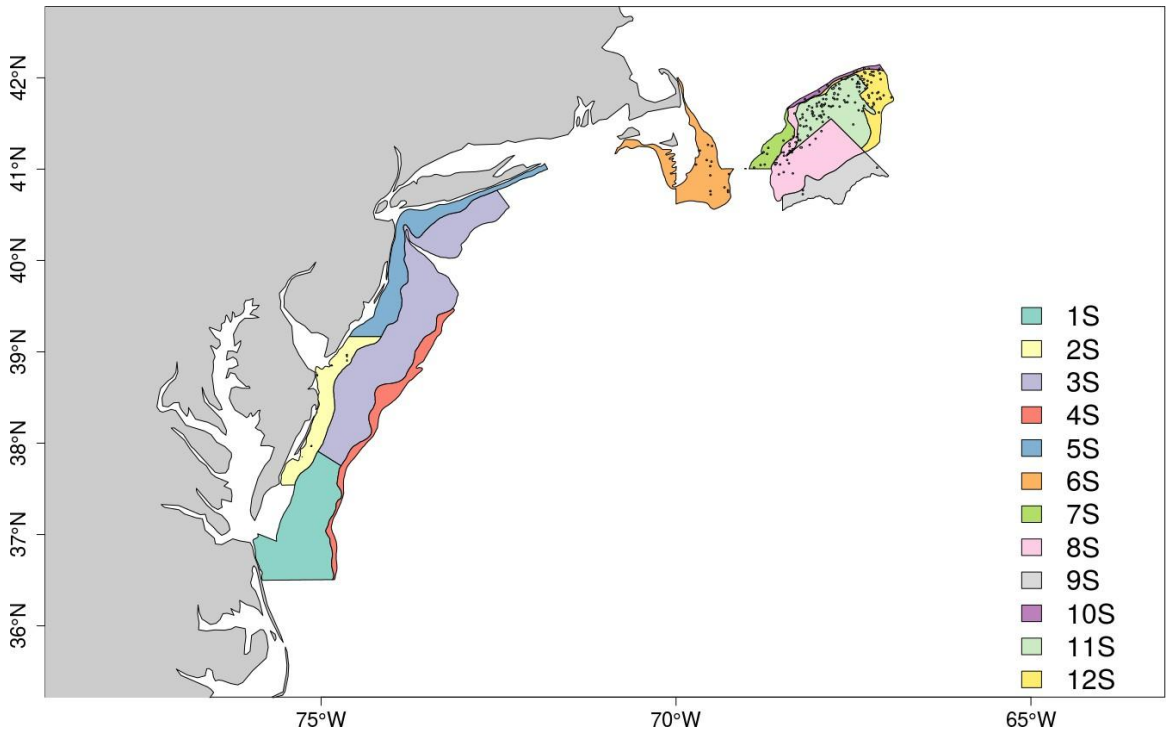


Figure 3. Atlantic surfclam strata used in the NEFSC clam survey.

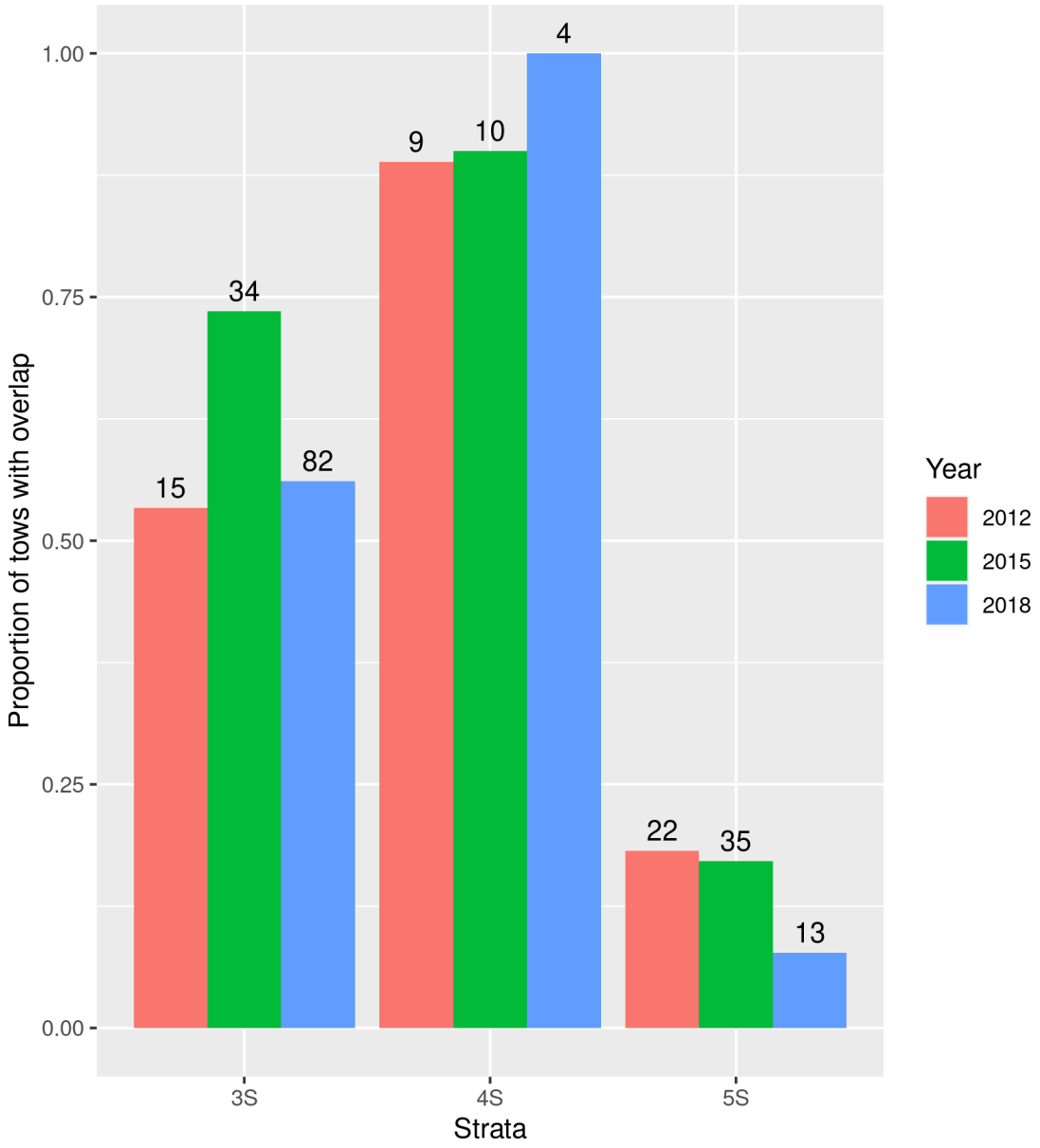


Figure 4. Proportion of all tows with 30+ total Atlantic surfclam containing at least 5% ocean quahog by number. Sample sizes are printed above each bar. Other strata in the southern area did not have sufficient tows that captured more than 30 surfclam to be included in this analysis.

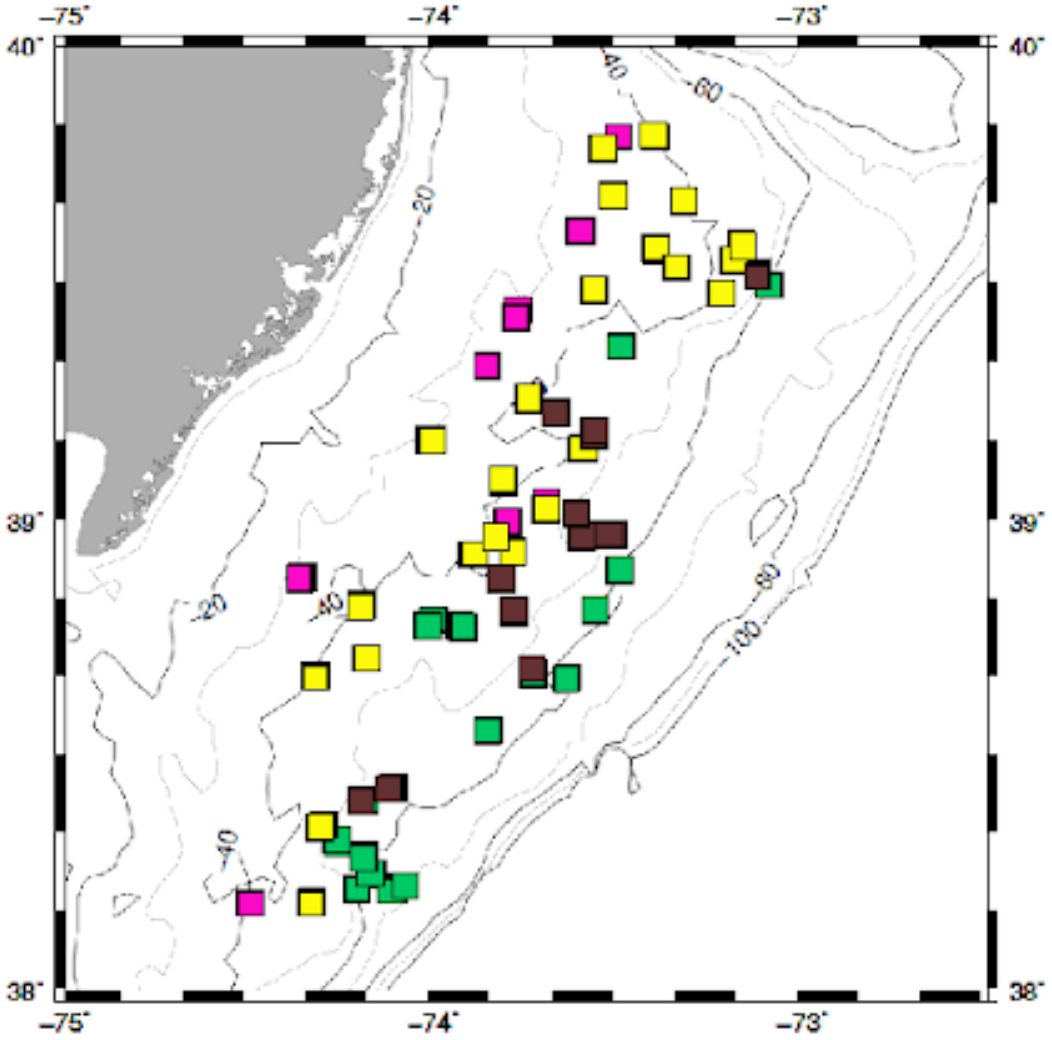


Figure 5. Locations sampled and catch characteristics. Dark pink boxes show locations where >24 of 25 clams were surfclams. Green boxes show locations where >24 of 25 clams were ocean quahogs. Yellow boxes show locations where at least 1 in 24 clams, but less than 12 in 24 were ocean quahogs. Brown boxes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

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: January 26, 2024

To: Council

From: Chris Moore, Executive Director

Subject: Executive Director's Report

The following materials are enclosed for review during the Executive Director's Report at the February 2024 Council Meeting:

1. 2025 Council Meeting Schedule
2. 2024 Planned Council Meeting Topics
3. 2024 Planned Actions and Deliverables
4. 2024 Stock Assessment Schedule and Assessment Meeting Dates for MAFMC-Managed Species
5. Action Plan: Summer Flounder Commercial Mesh Size Exemptions Framework/Addenda
6. Action Plan: Recreational Measures Setting Process Framework/Addenda
7. Agenda: Spiny Dogfish Ageing Workshop
8. New MAFMC Forage Web Page
9. Recreational Tilefish Permitting and Reporting Outreach/Program Evaluation:
    a. Project Narrative: Improving Catch and Effort Data Collection from Recreational Tilefish Anglers
    b. ACCSP Funding Letter
    c. Outreach Poster/Handout
    d. Project Narrative: Evaluation of MAFMC Private Recreational Tilefish Permitting and Reporting Program
10. NOAA Fisheries and BOEM Release Joint North Atlantic Right Whale and Offshore Wind Strategy

2025 Council Meeting Schedule

(As of November 12, 2023)

February 11-12, 2025	***(Virtual Meeting)***
April 8 – 10, 2025	
June 10 – 12, 2025* **(Last meeting for outgoing members)**	
August 11 – 14, 2025* **(New members sworn in on first day)**	
October 7 – 9, 2025	
December 8 – 11, 2025	

2024 Planned Council Meeting Topics

February 6 – 8, 2024 Council Meeting – Arlington, VA

- Joint MAFMC/NEFMC Framework to Reduce Atlantic Sturgeon Interactions in the Monkfish/Dogfish Gillnet Fisheries: approve final range of alternatives
- Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment: approve public hearing document
- Legal Review, Financial Disclosure, and Recusal Training (NOAA Office of General Counsel, Northeast)
- Offshore Wind Update
- Black Sea Bass Research Track Assessment Overview
- NEFSC Industry-Based Survey White Paper

April 9 – 11, 2024 Council Meeting – Atlantic City, NJ

- Joint MAFMC/NEFMC Framework to Reduce Atlantic Sturgeon Interactions in the Monkfish/Dogfish Gillnet Fisheries: final action
- Summer Flounder Commercial Mesh Exemptions Framework Meeting #1 (with ASMFC SFSBSB Board)
- 2024 Ecosystem Approach to Fisheries Management (EAFM) Risk Assessment Report
- 2024 State of the Ecosystem Report
- Golden Tilefish Research Track Assessment Overview
- Habitat Activities Update (GARFO-HESD)
- NTAP Proposal for Industry-Based Survey Pilot Program: review
- Golden Tilefish Catch Share Program Review: review public comments and discuss next steps

June 4 – 6, 2024 Council Meeting – Riverhead, NY

- Advisory Panel Reappointments (Executive Committee)
- 2025-2029 Strategic Plan: discuss vision, mission, goals (Executive Committee)
- Recreational Measures Setting Process Framework/Addenda: update (with ASMFC Policy Board)
- Summer Flounder Commercial Mesh Exemptions Framework Meeting #2 (with ASMFC SFSBSB Board)
- 2025 Atlantic Mackerel Specifications: review
- 2025 Chub Mackerel Specifications: review
- 2025 Longfin Squid Specifications: review
- 2025 *Illex* Squid Specifications: review
- Unmanaged Commercial Landings Report
- SSC's Overfishing Limit (OFL) Coefficient of Variation (CV) Guidance Document: review and approve updates

August 12 – 15, 2024 Council Meeting – Philadelphia, PA

- 2025 Atlantic Surfclam Specifications: review
- 2025 Ocean Quahog Specifications: review
- Recreational Measures Setting Process Framework/Addenda: approve public hearing document (with ASMFC Policy Board)
- 2025 Black Sea Bass Specifications: approve (with ASMFC SFSBSB Board)
- 2025 Summer Flounder Specifications: review (with ASMFC SFSBSB Board)
- 2025 Scup Specifications: review (with ASMFC SFSBSB Board)
- 2025 Bluefish Specifications and Recreational Management Measures: review (with ASMFC Bluefish Board)
- 2025-2026 Butterfish Specifications: approve
- 2025-2027 Golden Tilefish Specifications: approve
- 2025 Blueline Tilefish Specifications: approve
- Draft 2025-2029 Strategic Plan: review (Executive Committee)
- Council Program Review: review final report

October 8 – 10, 2024 Council Meeting – Dewey Beach, DE

- 2025 Implementation Plan: review draft deliverables (Executive Committee)
- 2025-2029 Strategic Plan: approve
- Atlantic Surfclam and Ocean Quahog Species Separation Requirements Amendment: final action
- Omnibus Essential Fish Habitat Amendment: approve public hearing document
- 2025 Spiny Dogfish Specifications: review
- Recreational Tilefish Permitting and Reporting Update (GARFO)
- Tilefish Angler Outreach and Program Evaluation: review report and discuss next steps
- Habitat Activities Update (GARFO-HESD)
- Offshore Wind Update
- Scientific Coordination Subcommittee 8th National Workshop Outcomes

December 9 – 12, 2024 Council Meeting – Annapolis, MD

- 2025 Black Sea Bass Recreational Management Measures: approve (with ASMFC SFSBSB Board)
- 2025 Summer Flounder Recreational Management Measures: review (with ASMFC SFSBSB Board)
- 2025 Scup Recreational Management Measures: review (with ASMFC SFSBSB Board)
- Recreational Sector Separation Amendment: approve scoping document (with ASMFC Policy Board)
- 2025-2029 Council Research Priorities: approve
- 2025 Implementation Plan: approve
- River Herring Data Portal Project: review
- Ricks E Savage Award Nominations (Executive Committee)
- Overview of National Fishing Effects Database
- 2024 EAFM Risk Assessment Report Updates: review

2024 PROPOSED ACTIONS AND DELIVERABLES

This section provides an overview of the activities, amendments, frameworks, specifications, and other projects the Council expects to initiate, continue, or complete during the year. These activities are organized by Fishery Management Plan (FMP) and topic area. See the Appendix for additional details about the proposed deliverables.

Note: Asterisks (*) denote contractor-supported projects.

SUMMER FLOUNDER, SCUP, BLACK SEA BASS

1. 2025 black sea bass specifications
2. 2025 summer flounder and scup specifications review
3. 2025 black sea bass recreational management measures
4. 2025 summer flounder and scup recreational management measures review
5. Recreational Measures Setting Process Framework/Addenda (continuing)
6. Recreational Sector Separation and Recreational Catch Accounting Amendment (continuing)
7. Advisory panel fishery performance reports
8. Black sea bass management track assessment support
9. Summer Flounder commercial mesh exemption framework
10. Scup bycatch prediction and avoidance modeling and research*

BLUEFISH

11. 2025 bluefish specifications review
12. 2025 bluefish recreational management measures review
13. Advisory panel fishery performance report

Note: Items 5 and 6 in the previous section will also address bluefish recreational management issues

GOLDEN AND BLUELINE TILEFISH

14. 2025-2027 golden tilefish specifications
15. 2025 blueline tilefish specifications
16. Advisory panel fishery performance reports
17. Update on private recreational tilefish permitting and reporting performance
18. Development of strategies to improve compliance with recreational tilefish permitting and reporting requirements*
19. Blueline tilefish operational assessment support
20. Golden tilefish research track assessment support
21. Golden tilefish management track assessment support
22. South Atlantic Deepwater Longline Survey expansion into Mid-Atlantic waters*

MACKEREL, SQUID, BUTTERFISH (MSB)

23. 2025-2026 butterfish specifications
24. 2025 Atlantic mackerel, chub mackerel, longfin squid, and *Illex* squid specifications review
25. Advisory panel fishery performance reports
26. Butterfish management track assessment support
27. Longfin squid research track assessment support*

28. Longfin squid biological sampling project*
29. Squid modeling project*

RIVER HERRING AND SHAD (RH/S)

30. RH/S run data portal development project*
31. RH/S bycatch prediction and avoidance modeling and research*

SPINY DOGFISH

32. 2025 spiny dogfish specifications review
33. Advisory panel fishery performance report
34. Spiny dogfish ageing project*
35. Spiny dogfish ageing workshop
36. Joint framework action to reduce Atlantic sturgeon bycatch in the monkfish and spiny dogfish fisheries (final action)

SURFCLAM AND OCEAN QUAHOG (SCOQ)

37. 2025 surfclam and ocean quahog specifications review
38. Advisory panel fishery performance reports
39. Atlantic surfclam management track assessment support
40. SCOQ electronic monitoring project*
41. Supplemental surfclam genetics project*
42. Surfclam and Ocean Quahog Species Separation Requirements Amendment (continuing)

SCIENCE AND RESEARCH

43. 2025-2029 Council research priorities
44. Updates to the SSC's Overfishing Limit (OFL) Coefficient of Variation (CV) Guidance Document
45. Supplemental port biological sampling*
46. Mid-Atlantic fish ageing project*
47. Northeast Trawl Advisory Panel (NTAP) coordination and facilitation

ECOSYSTEM AND OCEAN PLANNING/HABITAT

48. Joint Mid-Atlantic and New England Fishery Management Council offshore wind web page management
49. Council comments on habitat and fishery issues related to offshore energy development
50. 2024 Ecosystem Approach to Fisheries Management (EAFM) risk assessment report
51. National Fishing Effects Database project*
52. Omnibus Essential Fish Habitat Amendment (continuing)
53. Northeast Regional Habitat Assessment (NRHA) maintenance and integration of products
54. Comments on Exempted Fishing Permit (EFP) applications for Forage Amendment Ecosystem Component species (e.g., thread herring EFP application review)

GENERAL

55. 2025-2029 Strategic Plan
56. Reappointment of all advisory panels
57. Update on commercial landings of unmanaged species (including consideration of possible landings thresholds for further evaluation for management)

58. Participation on Council Coordination Committee Working Groups and Subcommittees (Habitat, Area-Based Management, Climate Change, Legislative, ESA/MSA Coordination, Equity and Environmental Justice, Council Member Ongoing Development)
59. Participation on marine mammal take reduction teams and protected resources working groups
60. Activities related to Marine Stewardship Council (MSC) certifications/audits for Council-managed fisheries (i.e., respond to requests for information)
61. Legislative issue tracking (including development of comments upon request)
62. Review of Vessel Monitoring System (VMS) utility and its use for enforcement (in coordination with NEFMC)

CLIMATE RESILIENCE AND GOVERNANCE

63. Program review of Council/GARFO processes for fishery management action development*
64. Evaluation of Council committee structure, use, and decision making (in collaboration with other East coast Councils; addresses scenario planning potential action G1)
65. Activities related to Inflation Reduction Act funded-projects for climate-ready fisheries (proposal development and project management)

COMMUNICATION AND OUTREACH

66. Ongoing communication activities to support understanding and awareness of the Council and its managed fisheries (development of web resources, email announcements, press releases, YouTube videos, webinars, face-to-face meetings, printed and digital communication materials, etc.)
67. Outreach campaigns to increase stakeholder awareness and understanding of Council actions under development and opportunities for participation
68. Council website improvements (continuing)

STAFF WRAP-UP ON COMPLETED ACTIONS

The following actions have been, or are expected to be, approved by the Council by the end of 2023 but will require staff work in 2024 to finalize for submission to NMFS:

69. Completion/submission of any outstanding specifications packages for 2024

POSSIBLE ADDITIONS

To be considered for addition to the 2024 implementation plan if time and resources allow:

70. Action to authorize an experimental Atlantic surfclam fishery in the Great South Channel Habitat Management Area (HMA)
71. Development of spatial management options for Atlantic surfclam open water aquaculture in the New York Bight and central Atlantic
72. Framework to allow quota transfer between commercial and recreational sectors for summer flounder, scup, and black sea bass
73. Action to implement "did not fish" reports for commercial, for-hire, and private tilefish permit holders
74. Coordination on Monkfish FMP actions initiated by the New England Council
75. Framework action to consider modifications to the commercial scup Gear Restricted Areas (GRA) or other measures to help reduce scup discards

2024

	Species/Topic	Stock Area	Management Organization(s)
February Research Track	Applying State Space Models		
March Research Track	Golden tilefish		MAFMC
June Management Track	Atlantic cod	Eastern Gulf of Maine	NEFMC
	Atlantic cod	Georges Bank	NEFMC
	Atlantic cod	Southern New England	NEFMC
	Atlantic cod	Western Gulf of Maine	NEFMC
	Atlantic herring		NEFMC, ASMFC
	Atlantic surfclam		MAFMC
	Black sea bass		MAFMC
	Butterfish		MAFMC, ASMFC
	Golden Tilefish		MAFMC
	Northern shrimp*		ASMFC
	Shad*		ASMFC
	Striped bass*		ASMFC
	Sturgeon*		ASMFC
July Joint US/Canada Assessments Transboundary Resources Assessment Committee (TRAC)	Atlantic cod	Eastern Georges Bank	NEFMC
	Haddock	Eastern Georges Bank	NEFMC
	Yellowtail flounder	Georges Bank	NEFMC
September Management Track	American plaice		NEFMC
	Atlantic halibut		NEFMC
	Haddock	Georges Bank	NEFMC
	Haddock	Gulf of Maine	NEFMC
	Pollock		NEFMC
	Witch flounder		NEFMC
November Research Track	Yellowtail flounder	Cape Cod / Gulf of Maine	NEFMC
		Southern New England / Mid-Atlantic	NEFMC
		Georges Bank [TRAC]	NEFMC

* Stock assessments denoted with an asterisk are conducted by the Atlantic States Marine Fisheries Commission. All other assessments are conducted by the Northeast Fisheries Science Center.

V. 10/6/2023

2024 Assessment Dates for MAFMC Species

Golden Tilefish 2024 Research Track Assessment

- **March 11-15, 2024** – Peer Review Meeting

June 2024 Management Track Assessment

- **June 24-28, 2024** – Peer Review Meeting for MAFMC-Managed Species (Atlantic Surfclam, Black Sea Bass, Butterfish, Golden Tilefish)

Additional assessment information and meeting details can be found on the Council's website at https://www.mafmc.org/stock-assessments.

Summer Flounder Commercial Mesh Size Exemptions Framework/Addenda

Draft Action Plan

January 2024

Framework/Addenda Goal: This management action is being developed by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission)'s Summer Flounder, Scup, and Black Sea Bass Board (Board). This action will evaluate potential changes to two exemptions to the summer flounder commercial minimum mesh size requirements, including 1) the Small Mesh Exemption Program (SMEP), and 2) the flynet exemption. Consideration of these changes is intended to modernize these requirements with consideration of current fishing industry gear use and practices and to provide additional flexibility to fishery participants while continuing to meet the conservation objectives of the FMP.

Alternatives to be Considered: The Council and Board have identified the issues below for exploration through this action. They may also identify other alternatives to address the objectives of the action at future meetings.

- **Small Mesh Exemption Program Area Revisions:** This action will consider modifications to the area associated with the SMEP for summer flounder, including evaluating suggested revisions made by fishing industry representatives during the Fall 2023 review process for this exemption.
- **Flynet Exemption Gear Definition Updates:** This action will consider modifying the regulatory definition of a flynet as it relates to the flynet exemption to the summer flounder commercial minimum mesh size. Changes would be considered in light of changes in the use and configuration of commercial trawl gear since this exemption was put in place in the 1990s.
- **Other alternatives**: This action may consider other alternatives, as appropriate. For example, this could include potential revisions to the timing associated with the SMEP, or administrative requirements associated with either exemption.

Fishery Management Action Team (FMAT) / Plan Development Team (PDT)

An FMAT/PDT is being formed to assist with development and analysis of potential alternatives. FMAT/PDT members are listed in the table below. Other Council, Commission, and NOAA Fisheries staff, as well as other experts, will be consulted as needed.

FMAT/PDT Member Name	Agency	Role/Expertise
Kiley Dancy	Mid-Atlantic Fishery Management Council	FMAT/PDT Co-Chair
Chelsea Tuohy	Atlantic States Marine Fisheries Commission	FMAT/PDT Co-Chair
Hannah Hart	Mid-Atlantic Fishery Management Council	FMAT/PDT Co-Chair
Laura Deighan	NMFS Greater Atlantic Regional Fisheries Office	Fisheries policy and legal requirements
Emily Keiley	NMFS Greater Atlantic Regional Fisheries Office	Fisheries policy and legal requirements
Marianne Randall	NMFS Greater Atlantic Regional Fisheries Office	National Environmental Policy Act requirements

Sara Turner	NMFS Greater Atlantic Regional Fisheries Office	Analysis and Program Support
TBD	NMFS Northeast Fisheries Science Center	Population dynamics
TBD	NMFS Northeast Fisheries Science Center	Observer program
TBD	NMFS Northeast Fisheries Science Center	Gear expertise (Consult as needed)

Draft Timeline – *Subject to change*

December 2023	● Council initiates framework action
February 2024	● Board initiates addendum (February 14 webinar meeting)
January-March 2024	● FMAT/PDT formed; first meeting(s) ● Development of range of alternatives and draft document for meeting 1
April 2024	● Framework/addendum meeting 1: approve range of alternatives; Board approves draft document for public hearings
April/May 2024	● Public comment period (30 days required for Commission addendum) and optional public hearings
May 2024	● FMAT/PDT and Advisory Panel meetings to provide input to Council and Board prior to final action
June 2024	● Framework/addendum meeting 2: final action
Late Summer/Fall 2024	● Development, review, and revisions of framework/addenda document(s) ● Federal rulemaking
November 1, 2024	● Effective date of implemented changes

Summer Flounder, Scup, Black Sea Bass, and Bluefish
Recreational Measures Setting Process Framework/Addenda

Draft Action Plan

January 2024

https://www.mafmc.org/actions/rec-measures-framework-addenda

Framework/addenda goal: This management action is being developed by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission). This is a follow-on action to the Recreational Harvest Control Rule Framework/Addenda, which implemented the Percent Change Approach for setting recreational management measures. In adopting the Percent Change Approach, the Council and the Commission's Interstate Fisheries Management Program Policy Board (Policy Board) agreed it should sunset by the end of 2025 with the goal of considering an improved measures setting process, as developed through this management action, starting with 2026 measures.

Alternatives to be considered: During their June 2022 and August 2023 meetings, the Council and Policy Board agreed to further develop the following alternatives through this management action. They may also identify other alternatives to address the objectives of the action at future meetings.

- **Percent Change Approach** – This approach was implemented starting with the 2023 recreational management measures for summer flounder, scup, and black sea bass. It will also be used for bluefish once that stock is no longer under a rebuilding plan. Under the Percent Change Approach, a determination is made to either liberalize, restrict, or leave measures unchanged based on two factors: 1) Comparison of a confidence interval around an estimate of expected harvest under status quo measures to the average recreational harvest limit (RHL) for the upcoming two years and 2) Biomass compared to the target level, as defined by the most recent stock assessment. These two factors are used to define a target harvest level for setting management measures. The target is defined as a percentage difference from expected harvest under status quo measures. The Percent Change Approach is described in detail in the reference guide and final framework document for the previous action. The Council and Policy Board agreed that further development of this approach should, at a minimum, include greater consideration of fishing mortality. This could include development of approaches to assign fishing mortality rates and targets to the recreational fishery.
- **Biological Reference Point Approach and Biological Based Matrix Approach** - These alternatives use a combination of indicators to place the stock in one of multiple potential management measure "bins." The indicators vary by alternative and include expected harvest under status quo measures, biomass compared to the target level, fishing mortality, recruitment, and/or trends in biomass. The intent is that bins associated with poor indicators would have more restrictive management measures and bins with positive indicators would have more liberal measures. These alternatives are described in more detail in the reference guide and final framework document for the previous action. The Council and Policy Board agreed that further development of these alternatives should at a minimum include development of example measures using modeling (e.g., the Summer Flounder Management Strategy Evaluation model) or other approaches. In December 2023, the Council and the Policy Board agreed to modify these alternatives such that measures will no longer be assigned to all bins the first time either

approach is used through the specifications process. Further consideration will be given to the appropriate method for setting measures under these alternatives.

Other topics to be considered: During their June 2022 and August 2023 meetings, the Council and Policy Board agreed that the following additional topics should also be considered through this management action. These are not management alternatives; rather, they are topics that will be considered in the context of the management alternatives listed above.

- **Target metric for setting measures** – The previous framework/addenda considered if recreational measures in state and federal waters should collectively aim to achieve a target level of harvest (e.g., based on the RHL), recreational dead catch (e.g., based on the recreational annual catch limit), or fishing mortality. This will be further considered through this action.
- **Starting point for measures** – Many recreational stakeholders have expressed frustration that the current measures do not appear to be aligned with stock status. The Council and Policy Board agreed that further consideration should be given to the starting point for measures under all alternatives.
- **Management uncertainty** – The Council and Policy Board agreed that further consideration should be given to the implications of the alternatives for management uncertainty buffers as currently defined in the Fishery Management Plan.
- **Use of the Summer Flounder Management Strategy Evaluation (MSE) model** – The previously developed Summer Flounder MSE model will be used to analyze several aspects of this management action. For example, it may be used to evaluate the performance of potential indicator thresholds which define the boundaries between management measure bins, the management response to crossing those thresholds, and measures assigned to each management response. Given time constraints, simplifying assumptions will need to be made and realistic example measures are not expected to be generated for every bin under all alternatives.
- **Impacts on the commercial sector** – Although this action will only consider the process for setting recreational measures, the Council and Policy Board agreed to further evaluate potential indirect impacts to the commercial sector. This action will not consider any changes to commercial management and it will not consider transferring quota between the commercial and recreational sectors.
- **Other topics** – This action may consider other topics, as appropriate. For example, this could include potential revisions to the accountability measures and considerations related to conservation equivalency.

Fishery Management Action Team (FMAT) / Plan Development Team (PDT)

An FMAT/PDT has been formed to assist with development and analysis of potential alternatives. FMAT/PDT members are listed in the table below. Other Council, Commission, and NOAA Fisheries staff, as well as other experts, will be consulted as needed.

FMAT/PDT Member Name	Agency	Role/Expertise
Tracey Bauer	Atlantic States Marine Fisheries Commission	FMAT/PDT Co-Chair
Julia Beaty	Mid-Atlantic Fishery Management Council	FMAT/PDT Co-Chair
Chelsea Tuohy	Atlantic States Marine Fisheries Commission	FMAT/PDT Co-Chair
Mike Celestino	New Jersey Department of Environmental Protection	Technical analysis and state management
Alexa Galvan	Virginia Marine Resources Commission	Technical analysis and state management
Emily Keiley	NMFS Greater Atlantic Regional Fisheries Office	Fisheries policy and legal requirements
Marianne Randall	NMFS Greater Atlantic Regional Fisheries Office	National Environmental Policy Act requirements
Scott Steinback	Northeast Fisheries Science Center	Recreational fisheries economist
Rachel Sysak	New York Department of Environmental Conservation	Technical analysis and state management
Corinne Truesdale	Rhode Island Department of Fish and Wildlife	Technical analysis and state management
Sam Truesdell	Northeast Fisheries Science Center	Stock assessments
Sara Turner	NMFS Greater Atlantic Regional Fisheries Office	Scientific and technical analysis of federal fisheries management

Commissioner/Council Member Work Group

The Council and Policy Board established a small group of Commissioners and Council members to act as a liaison between the PDT/FMAT and the Policy Board. The purpose of the Work Group is to guide the FMAT/PDT on the intent of the Council and Policy Board, not to develop new options/alternatives. This group will periodically meet with the PDT/FMAT. Work Group members are listed below.

Work Group Member Name	Council Member or Commissioner
Skip Feller	Council member
Jason McNamee	Commissioner
Nichola Meserve	Commissioner
Adam Nowalsky	Both
Paul Risi	Council member

Draft Timeline – *Subject to change*

May 2023	• FMAT/PDT formed.
June - July 2023	• FMAT/PDT meetings.
August 2023	• Council and Policy Board meeting to review progress and discuss next steps. • Council member/Commissioner work group formed.
September - November 2023	• FMAT/PDT and Council member/Commissioner work group meeting. • AP meeting to review progress and provide input. • Scientific and Statistical Committee (SSC) meeting to review progress.
December 2023	• Council and Policy Board meeting to review progress and discuss next steps.
January - June 2024	• FMAT/PDT and Council/Commissioner work group meetings to continue development and analysis of alternatives and develop draft document for public hearings. • Formation and meetings of an SSC sub-committee to assist with analysis.
June 2024	• Council and Policy Board meeting to review progress and discuss next steps.
July 2024	• SSC meeting to review draft sub-group report and finalize report from full SSC. • AP meeting to review draft range of alternatives and provide input to Council and Policy Board.
August 2024	• Council and Policy Board meeting to approve final range of alternatives and approve draft document for public hearings through Commission process.
Fall 2024	• Public hearings through Commission process.
Late 2024 - Early 2025	• FMAT/PDT and AP meetings to provide input to Council and Policy Board prior to final action.
April 2025	• Council and Policy Board meeting for final action.
April-December 2025	• Development, review, and revisions of framework/addenda documents. • Federal rulemaking. • Monitoring and Technical Committee use new process to set 2026 recreational measures.
Late 2025 or early 2026	• Effective date of implemented changes.

Agenda – Atlantic spiny dogfish ageing workshop

January 22-23rd, 2024

Sheraton Raleigh Hotel, 421 S Salisbury St, Raleigh, NC

Day 1/Jan. 22nd

08:30: Welcome and Introductions – Michelle Passerotti

08:45: Ageing Atlantic spiny dogfish at the NEFSC: Past, present, and future – Michelle Passerotti/Jonathan Auguste

09:30: Perspectives on *S. acanthias* ageing in the northeastern US – Marta Nammack/Wally Bubley

10:15: Break

10:30: VIMS ageing perspectives – Jameson Gregg

11:00: Discussion

11:30: Lunch (on your own, plenty of walkable locations near the hotel)

1:00: Perspectives from spiny dogfish ageing on two coasts– Cindy Tribuzio (remote)

1:45: Ageing protocol overview – Cindy Tribuzio + group

2:45: Break

3:00: Hands-on ageing using reference collection/age trial

5:00: End Day 1

Day 2/Jan. 23rd

08:00: Recap day 1 – Michelle Passerotti

08:15: Ageing spiny dogfish in Norway – Rosario Lavezza, Norway Institute of Marine Research

09:00: Bayesian techniques for spiny dogfish age and growth studies – Fabio Caltabellotta/Lisa Hillier

09:45: Break

10:00: Practical discussion
Developing best practices and SOPs

Cleaning
Counting
Workflows
Precision tools
Data analysis

11:45: Final thoughts/discussion

12:30: Meeting adjourned

Forage Management in the Mid-Atlantic

https://www.mafmc.org/forage

Forage species are small, low trophic level fish and invertebrates that play an important role in marine food webs. These species facilitate the transfer of energy to higher trophic levels by consuming very small prey and then being eaten by larger fish, marine mammals, and seabirds. Many forage species are short-lived and undergo substantial cyclic fluctuations in stock size. Abundance of forage species is often sensitive to environmental variables. These factors pose challenges for traditional stock assessment and management approaches.

In 2016, as part of its **Ecosystem Approach to Fisheries Management (EAFM) Guidance Document**, the Mid-Atlantic Council adopted a policy of supporting the "maintenance of an adequate forage base in the mid-Atlantic to ensure ecosystem productivity, structure and function, and to support sustainable fishing communities." The EAFM Guidance Document also outlines the Council's science and management goals and strategies of both managed and unmanaged forage species related to their roles in the ecosystem, the economy, and society more generally.

Managed Forage Species

The Mid-Atlantic Council manages five forage species – Atlantic mackerel, chub mackerel, *Illex* squid, longfin squid, and butterfish – under a **single Fishery Management Plan** (FMP). The Council sets annual catch limits, accountability measures, and other management measures that are intended to prevent overfishing while allowing these fisheries to achieve optimum yield.

The Council is also involved in the conservation and management of river herring (alewives and blueback) and shad (American and hickory). The Atlantic States Marine Fisheries Commission (ASMFC) has primary management responsibility for river herring and shad (RH/S), as there are no directed fisheries for these species in federal waters. However, the Council sets measures to limit the incidental catch of RH/S in the Atlantic mackerel fishery. The Council also collaborates with

NOAA Fisheries and the ASMFC on the Atlantic Coast River Herring Collaborative Forum to help address broader river herring conservation issues. Learn more **here**.

Protections for "Unmanaged" Forage Species

Unmanaged Forage Amendment

In August 2016, the Mid-Atlantic Fishery Management Council took final action on the **Unmanaged Forage Omnibus Amendment** (Forage Amendment). This amendment established a 1,700 pound possession limit for over 50 forage species which were previously unmanaged in Mid-Atlantic Federal waters. These species were designated as ecosystem component (EC) species in all the Council's FMPs. The possession limit applies to combined landings of all EC species.

The goal of the Forage Amendment was to prohibit the development of new and expansion of existing directed commercial fisheries for unmanaged forage species until the Council has had an adequate opportunity to assess the scientific information relating to any new or expanded directed fisheries and consider potential impacts to existing fisheries, fishing communities, and the marine ecosystem. See the Forage ID guide linked below for a list of taxa designated as ecosystem components by the Council through the Forage Amendment. The federal regulations at 50 CFR 648.2 further enumerate this list to the species level.

- **Unmanaged Forage ID Guide**

Exempted Fishing Permits (EFP) for Forage Amendment EC Species

The Forage Amendment requires use of an Exempted Fishing Permit (EFP) as a first step towards the Council considering allowing landings beyond the 1,700 pound possession limit. An EFP is a permit that exempts a vessel from certain specified federal fishing regulations. EFPs for Forage Amendment EC species are issued by the NOAA Fisheries Greater Atlantic Regional Fisheries Office (GARFO).

In December 2023, the Council approved a guidance document for review of EFP applications for Forage Amendment EC species. The document is intended to establish a standard process for Council review of relevant EFP applications. This document outlines the information needed by the Council to inform its review of EFP applications for Forage Amendment EC species. The document does not modify or replace the process described in the federal regulations for obtaining EFPs from the National Marine Fisheries Service (NMFS) regional offices.

- **Guidance Document for Council Review of Exempted Fishing Permit Applications for Unmanaged Forage Amendment Ecosystem Component Species** (December 2023)

Unmanaged Landings Reports

As a follow on to the Forage Amendment, the Council requested that NOAA Fisheries provide annual updates on commercial landings of Forage Amendment EC species as well as other "unmanaged" species (i.e., species not managed by the Mid-Atlantic, New England, or South Atlantic Councils, NOAA Fisheries, the Atlantic States Marine Fisheries Commission, or states).

These **Unmanaged Landings Reports** allow the Council to monitor for signs of developing unmanaged commercial fisheries in the Mid-Atlantic. New or growing fisheries could develop in response to changing species distributions, changing markets, changes in other fisheries, or for other reasons. The information contained in these annual reports can serve as a high level summary to help determine if further evaluation is needed and if consideration of a management response may be warranted.

Additional Resources

- White Paper: Managing Forage Fishes in the Mid-Atlantic Region
- EAFM Guidance Document, revised 2/8/19

Staff Contacts

- **Forage Amendment, EFP review process, unmanaged landings reports, and chub mackerel**: Julia Beaty, Fishery Management Specialist - 302-526-5250, jbeaty@mafmc.org
- **Atlantic mackerel, longfin squid,** Illex **squid, butterfish, river herring, and shad**: Jason Didden, Fishery Management Specialist – 302-526-5254, jdidden@mafmc.org

Improving Catch and Effort Data Collection from Recreational Tilefish Anglers

Project Narrative

This proposal aims to involve private anglers in the recreational fishing community who hold tilefish permits and are required to report their tilefish catch using a mobile application. The goal is to engage them through different outreach initiatives, which will be described in detail later in the proposal, to raise awareness about the tilefish reporting regulations and promote the use of the app.

The specific objectives would include:

- Improve compliance with recreational tilefish mandatory reporting.
- Conduct outreach activities to the recreational fishing community.
- Improve the collected analytic metadata within eFin such as number and locations of trips, ports landed, number of catches submitted, usage of specific app features, errors encountered during upload, etc.

Background/Need

The Mid-Atlantic Fishery Management Council (MAFMC) is responsible for developing and implementing fishery management plans (FMPs) that promote the conservation and sustainable use of fishery resources in the Mid-Atlantic region. The Council's management decisions are based on the best available scientific information and are designed to prevent overfishing while achieving optimum yield from each fishery. Tilefish is managed by the MAFMC from Maine through the Virginia/North Carolina border. For most fisheries, recreational catch and effort are estimated by National Oceanic Atmospheric Administration's (NOAA) Marine Recreational Information Program (MRIP) using a suite of surveys to collect data from anglers. However, because tilefish are caught far offshore and relatively few anglers participate in the fishery, MRIP estimates may not accurately capture recreational catch and effort. To address these concerns, in August 2020, mandatory permitting and reporting requirements for private recreational vessels fishing for blueline or golden tilefish were implemented. Although for-hire and commercial fishermen have been reporting their harvest for many years, mandating private recreational anglers to report tilefish trips electronically was a first for the east coast. Under these regulations, private recreational vessels must obtain a federal private recreational tilefish vessel permit to target or retain golden or blueline tilefish. These vessel operators are also required to submit vessel trip reports electronically within 24 hours of returning to port for trips where tilefish were targeted or retained. These requirements are intended to improve our understanding of recreational tilefish catch and effort.

However, since the mandatory permitting and reporting requirements were implemented, angler reporting rate has been very low. Collectively from 2020 through October 2023 about 3,074 permits have been issued to 1,564 unique vessels, but only 146 trips have been reported (about

1,995 tilefish - 1,132 blueline and 783 golden tilefish and 107 tilefish species unknown). This mismatch between the number of permits issued and the number of reported trips highlights the need for outreach to improve the overall awareness of and compliance with the tilefish permitting and reporting requirements. At this time, it is unclear if anglers are simply unaware of the requirements or if there are other hurdles associated with the lack of reporting. Additional outreach will provide insight into this issue and enable us to identify potential solutions. Successful reporting is critical to improving our understanding of recreational golden and blueline tilefish catch and effort and will ensure that the fisheries are being monitored and managed appropriately. Additionally, given the increasing interest in private recreational reporting requirements for other fisheries, successful tilefish reporting could provide a gold standard for future discussions or actions on this topic.

Results and Benefits

This proposal is intended to increase reporting of tilefish by recreational anglers. It is critical that management decisions for the tilefish fishery are based on the best available scientific information and are designed to prevent overfishing while achieving optimum yield from each fishery. The MAFMC's implementation of mandatory reporting for tilefish represents a significant stride towards sustainable fisheries management. This initiative not only serves to enhance the monitoring and conservation of tilefish populations but also offers valuable insights and lessons for other agencies considering mandatory recreational reporting for different species.

We expect the following tasks and approaches to produce results that reflect increased reporting of private recreational caught tilefish and will improve private recreational data on tilefish catch and effort.

Tasks/Approach:

I. Create outreach materials including but not limited to, presentations, brochures, and flyers describing the tilefish reporting requirement for audiences at fishing shows, fishing clubs, tackle shops, current permit holders, and other interested groups/individuals.

II. Prepare outreach article describing the purpose of and need for the tilefish reporting requirement, how to acquire the permit, and options for self-reporting, for publication in *On The Water Magazine* and sharing on *On The Water's* social media pages. Sharing information about the permit on *On The Water's* podcast is also a possibility.

III. Attend a minimum of four major fishing shows/seminar series in the southern New England and Mid-Atlantic regions and host a booth and/or give brief presentations to describe the tilefish self-reporting requirement. If feasible, provide attendees with an opportunity to acquire the permit on-site. Decisions on which shows to attend will be made based on input from MAFMC staff, state managers, and local stakeholders. Attend each show for a minimum of two days each. Hours are inclusive of travel time.

Examples of events that could be of particular interest to tilefish anglers include:

- Castafari Offshore Fishing Seminar, Quincy, MA (March 2-3, 2024)
- New England Saltwater Fishing Show, Providence, RI (March 8-10, 2024)
- Canyon Runner Seminar Series, Atlantic City, NJ (February 2-3, 2024)

- Saltwater Fishing Expo, Edison, NJ (March 15-17, 2024)
- Ocean City Boat Show, Ocean City, MD (February 16-18, 2024)
- Mid-Atlantic Sports and Boat Show, Virginia Beach, VA (TBD)

IV. Attend and present at a minimum of four local saltwater/offshore fishing club meetings to describe the tilefish self-reporting requirement and, if feasible, provide attendees with an opportunity to acquire the permit-on-site. Decisions on which shows to attend will be made based on input from MAFMC staff, state managers, and local stakeholder. Hours are inclusive of travel time.

Examples of clubs that may include a significant number of tilefish anglers include:

- South Shore Marlin and Tuna Club (NY)
- Staten Island Tuna Club (NY)
- Manasquan River Marlin and Tuna Club (NJ)
- Forked River Tuna Club (NJ)
- Ocean City Marlin Club (MD)
- Peninsula Salt Water Sport Fisherman's Association (VA)
- Virginia Beach Bluewater Fishing Club (VA)

V. Metadata: Enhance eFin application analytics infrastructure to better understand the effectiveness of outreach efforts to increase the usage of the application and the analysis of any correlations between outreach efforts and increased reporting results. By improving the infrastructure for the collection of analytics, data will be retained on a persistent basis without manually tabulating data periodically, making analysis more convenient and more valuable.

VI. Pursue opportunities to collaborate with/leverage resources of the NOAA Fisheries Atlantic Highly Migratory Species (HMS) Management Division given the existing overlap of user groups.

Specific approaches could include:

- Use HMS Angling permit-holder contact information for the purposes of direct outreach regarding the need to acquire the tilefish permit and report catch/effort (MAFMC staff have communicated that 2022 HMS Angling permit-holder information has already been shared with the MAFMC by HMS Management Division staff.).
- Coordinate tilefish outreach with HMS Recreational Coordinator to identify synergies and opportunities for shared engagement with offshore anglers.
- Explore possibility of presenting on the tilefish requirement at the spring meeting of the Atlantic HMS Advisory Panel Meeting (W. Goldsmith is an AP member and the HMS Management Division is currently exploring options to increase reporting compliance for its own recreational self-reporting requirement).

Geographic location:

All states north of the North Carolina/Virginia border, with a targeted focus on Mid-Atlantic / New England states with known private recreational tilefish effort. Target states include Virginia, Maryland, Delaware, New Jersey, New York, Rhode Island, and Massachusetts.

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200A-N | Arlington, VA 22201
703.842.0780 | 703.842.0779 (fax) | www.accsp.org

24 January 2024

Hannah Hart
Mid-Atlantic Fisheries Management Council
800 N. State Street
Suite 201
DE, Dover 19901

Dear Hannah,

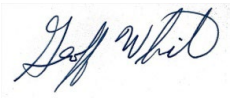
At its October 17, 2023 meeting, the ACCSP Coordinating Council approved the Mid-Atlantic Fisheries Management Council's proposal entitled "*Improving Catch and Effort Data Collection from Recreational Tilefish Anglers*" for the amount of $65134.

The NOAA Grants Office has been notified of this award. The office will provide you with its "Guidelines for Submitting to the Grants Office" document for further guidance on the submission process. I recommend agency personnel begin to prepare the documents required by the Grants Office soon in order to facilitate timely approval of this proposal.

Please send electronic copies of your grant application and project reports, as well as any other relevant project documents, to the ACCSP Deputy Director, Julie DeFilippi Simpson (julie.simpson@accsp.org). This will allow us to track project progress and maintain a steady flow of information between the program and our partners. In this way, we can share lessons learned which may benefit our other state and federal partners in improving and implementing their own programs.

Congratulations on your award.

Sincerely,



Geoff White
ACCSP Director

cc: Julie DeFilippi Simpson

Atlantic Coastal Cooperative Statistics Program
1050 N. Highland Street, Suite 200A-N | Arlington, VA 22201
703.842.0780 | 703.842.0779 (fax) | www.accsp.org

ATTENTION TILEFISH ANGLERS!
Blueline and Golden Tilefish Permitting and Reporting Requirements

Our Tilefish Fishery

- Both blueline (or gray) and golden tilefish are popular targets for offshore anglers in the Northeast and Mid-Atlantic.
- Recreational fishermen are thought to account for a sizable amount of harvest for both species.

Blueline (or gray) tilefish (left) and golden tilefish (right)

Management Challenges

- Due to their deep-water habitat and unique life-history, both tilefish species are considered "data-poor," making effective management challenging.
- It is particularly difficult to estimate how many tilefish are harvested by private anglers.
- **Fishery scientists and managers urgently need to understand how many anglers target tilefish, how much time they spend fishing, and how many fish they catch to better assess these species' overall health and ensure a strong fishery into the future.**

If you own or operate a private recreational vessel and target tilefish from Virginia northward, you are required to possess a free recreational tilefish permit and submit a trip report within 24 hours of returning to port from a tilefish trip. Here's how to stay legal.

Step 1: Get a Permit

- The **free** annual permit helps managers understand the potential "universe" of tilefish anglers. It is required for both private vessels and for-hire vessels fishing privately.
- This is a vessel permit; you do not need to obtain it if fishing on someone else's vessel.
- To obtain the permit, visit the NOAA Fisheries' **Fish Online** website, create an account, and apply for a Private Recreational Tilefish Permit.
- Fishing for/keeping tilefish without a permit can result in a civil violation of $500.

NOAA Fish Online:

Plan Ahead: The permit can take up to 30 days to be issued, so be sure to apply well before your first trip targeting tilefish this season.

Step 2: Submit Trip Reports

- Vessel owners/operators must submit electronic trip reports for all trips on which tilefish are targeted, **even if you didn't catch or keep any fish.**
- A mobile app called **eFin Logbook** has been developed for tilefish reporting.
  - Download the app to your smartphone or tablet and log in using your Fish Online credentials.
  - After each trip, submit key information such as: number of anglers, time spent fishing, and number of tilefish kept/discarded.
- Learn more at bit.ly/efinlogbook

eFin for iPhone:

eFin for Android:

Remember: Trip reports must be submitted within 24 hours of returning to port from any trip on which you fished for tilefish, even if you targeted other species.

The Data That YOU Report Will Help Ensure Healthy Fisheries for Years to Come

Accurate reporting of catch and fishing effort will help improve our understanding of the blueline and golden tilefish fisheries and ensure that these fisheries are being monitored and managed appropriately. **Your efforts now are an investment in long-term fishery health.**

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Learn More: Visit bit.ly/mafmc for additional information, resources, and contacts.

Program Evaluation: Mid-Atlantic Fishery Management Council Private Angler Tilefish Reporting

Project Narrative

This proposal aims to conduct a series of in-person meetings with recreational tilefish community leaders to evaluate the Mid-Atlantic Fishery Management Council's (MAFMC) private angler tilefish permitting and reporting requirement and identify potential strategies for future success. While the requirement has been in place since August 2020, the program continues to encounter challenges with recruiting anglers to acquire the permit and then to report golden and blueline tilefish catch/effort, inhibiting the ability of the MAFMC and NOAA Fisheries to use the data for science and management purposes.

Through the approaches described below, Pelagic Strategies, in partnership with Stevenson Sustainability Consulting, will convene in-person, regionally focused "grasstops" meetings and solicit candid views directly from fishery participants regarding potential barriers to compliance and opportunities for increased participation. This effort will complement and enhance the MAFMC's upcoming outreach campaign to raise awareness of the tilefish permitting/reporting requirement at stakeholder events (fishing shows/club events) this coming winter. In addition, it could serve as a valuable precursor to development of a more robust program evaluation/strategic plan.

Background/Need

The Council is responsible for developing and implementing fishery management plans (FMPs) that promote the conservation and sustainable use of fishery resources in the Mid-Atlantic region. The Council's management decisions are based on the best available scientific information and are designed to prevent overfishing while achieving optimum yield from each fishery. Tilefish is managed by the MAFMC from Maine through the Virginia/North Carolina border. For most fisheries, recreational catch and effort are estimated by NOAA's Marine Recreational Information Program (MRIP) using a suite of surveys to collect data from anglers. However, because tilefish are caught far offshore and relatively few anglers participate in the fishery, MRIP estimates may not accurately capture recreational catch and effort. To address these concerns, in August 2020, mandatory permitting and reporting requirements for private recreational vessels fishing for blueline or golden tilefish were implemented. Although for-hire and commercial fishermen have been reporting their harvest for many years, mandating private recreational anglers to report tilefish trips electronically was a first for the east coast. Under these regulations, private recreational vessels must obtain a federal private recreational tilefish vessel permit to target or retain golden or blueline tilefish. These vessel operators are also required to submit vessel trip reports electronically within 24 hours of returning to port for trips where tilefish were targeted or retained. These requirements are intended to improve our understanding of recreational tilefish catch and effort.

However, since the mandatory permitting and reporting requirements were implemented, the angler reporting rate has been very low. Collectively from August 2020 through October 2023 about 3,074 permits have been issued to 1,564 unique vessels, but only 146 trips have been

reported (about 1,995 tilefish - 1,132 blueline and 783 golden tilefish and 107 tilefish species unknown). This mismatch between the number of permits issued and the number of reported trips highlights the need to evaluate the current requirements and investigate potential barriers to compliance.

Results and Benefits

This proposal is intended to evaluate the current private recreational tilefish permitting and reporting requirements and identify potential strategies for future success. This effort will complement and enhance the MAFMC's upcoming outreach campaign to raise awareness of the tilefish permitting/reporting requirement at stakeholder events (fishing shows/club events) this coming winter. In addition, it could serve as a valuable precursor to the development of a more robust program evaluation/strategic plan.

Tasks/Approach:

I. Initial scoping to identify key "grasstops" leaders within the private angler tilefish community in each of five regions along the east coast: 1) Long Island, New York; 2) Northern New Jersey; 3) Southern New Jersey; 4) Coastal Maryland; and 5) Coastal Virginia. Examples of community leaders include: Tackle shop owners; offshore fishing club presidents/board members; outdoor writers/social media "influencers"; and particularly avid/well-known tilefish anglers. We will aim to identify three to six leaders within each region.

II. Prepare a list of questions/discussion points to structure the meetings. Specific topics to discuss may include:
   - Perception of angler awareness/compliance in their region
   - Perception of why the program exists and how the data could be used
   - Angler attitudes about the program and barriers to compliance
   - Tangible steps that the MAFMC or NOAA Fisheries could take to increase participation
   - Broader views on recreational fishery catch and effort estimation and the role of angler electronic self-reporting
   - Scope angler attitudes to alternative regulatory mechanisms. Develop alternative approaches to potentially consider for improving estimates of private recreational tilefish catch and fishing effort.

III. Organize and facilitate five in-person, informal tilefish "grasstops" leader meetings/workshops in each of the regions. We anticipate that each workshop will take approximately three hours. Workshops will begin with a brief overview presentation of the tilefish reporting requirement and progress to date before moving into the questions developed in Task II. Workshops will be hosted at venues convenient to participants (and cost-effective where possible; e.g., in university/non-profit office space), and participants will be reimbursed at the rate of $200 for their time/travel. Meetings will occur over the course of two trips: One trip for the Long Island and two New Jersey meetings; and one trip for the Maryland and Virginia meetings.

IV. Synthesize key meeting themes and provide strategic recommendations for potential next steps in the form of an oral presentation to the MAFMC's Tilefish Committee/Advisory Panel and full MAFMC and a written report (both the report and presentation deliverables will be complete by August 31, 2024).

NOAA Fisheries and BOEM Release Joint North Atlantic Right Whale and Offshore Wind Strategy

NOAA National Marine Fisheries sent this bulletin at 01/25/2024 01:56 PM EST

January 25, 2024

NOAA Fisheries and BOEM Release Joint North Atlantic Right Whale and Offshore Wind Strategy

Today, NOAA Fisheries and the Bureau of Ocean Energy Management announced the release of their final joint strategy to protect and promote the recovery of endangered North Atlantic right whales while responsibly developing offshore wind energy.

The joint strategy identifies the agencies' goals and key actions to continue to evaluate and mitigate the potential effects of offshore wind energy development on North Atlantic right whales and their habitat. It also builds on existing mitigation measures that are already in place to protect North Atlantic right whales from the potential impacts of offshore wind development.

Under this strategy, NOAA Fisheries and BOEM will take several actions to avoid, minimize, and monitor impacts to North Atlantic right whales from offshore wind development. For example, the agencies will advance current and novel

technologies—such as uncrewed systems, artificial intelligence, and passive acoustic monitoring—to achieve the strategy's mitigation, research, and monitoring goals.

Other specific actions called for in the strategy include:

- Avoiding leasing in areas where major impacts to right whales may occur.
- Establishing noise limits during construction.
- Supporting research to develop new avoidance and minimization technologies; and
- Prioritizing research, development, and implementation of mitigation related to quieting technology and methods for offshore wind development.

This strategy exemplifies how the Administration's all-of-government approach can leverage the resources and expertise of federal agencies like BOEM and NOAA Fisheries to protect ocean biodiversity and co-use while helping ensure the responsible development of offshore wind energy to address the climate crisis.

It is also a key component of NOAA Fisheries' North Atlantic Right Whale Road to Recovery, a plan that encapsulates our ongoing work across the agency and in collaboration with partners to address threats to the species and monitor recovery progress. The North Atlantic right whale is one of the world's most endangered large whale species. The latest estimate suggests there are approximately 360 remaining, with fewer than 70 reproductively active females. Climate change is affecting every aspect of right whales' survival—changing their ocean habitat, their migratory patterns, the location and availability of their prey, and even their risk of becoming entangled in fishing gear or being struck by vessels.

For more information on the strategy, go to our website.

New England Fishery Management Council Meeting Agenda
Tuesday – Thursday, January 30-February 1, 2024
The Venue at Portwalk Place, 22 Portwalk Place, Portsmouth, NH 03801
tel: (603) 422-6114 | The Venue at Portwalk Place
Webinar Registration Option

PUBLIC COMMENTS: *The Council's "Guidelines for Providing Public Comments" can be found **here**. Anyone interested in speaking during the open period for public comment on Tuesday, January 30, 2023 at 1:45 p.m. should fill out the sign-up sheet on the table at the entrance to the Council meeting room. To speak remotely, email Janice Plante at jplante@nefmc.org to get on the list.*

Tuesday, January 30, 2024

9:00 a.m. **Closed Session** (Council Chair Eric Reid)
Council discussion on Scientific and Statistical Committee appointments

9:30 **Introductions and Announcements** (Council Chair Eric Reid)

9:35 **Reports on Recent Activities**
Council Chair, Council Executive Director, Greater Atlantic Regional Fisheries Office (GARFO) Regional Administrator, National Oceanic and Atmospheric Administration (NOAA) General Counsel, Northeast Fisheries Science Center (NEFSC), Mid-Atlantic Fishery Management Council (MAFMC), Atlantic States Marine Fisheries Commission (ASMFC), U.S. Coast Guard, NOAA Enforcement, U.S. Fish and Wildlife Service, and ICCAT Advisory Committee

10:45 **Risk Policy Working Group Report** (Megan Ware)
Progress report on addressing Terms of Reference 1 and 2 to revise the Council's Risk Policy

12:00 p.m. **Aquaculture** (Kevin Madley, GARFO; Chris Schillaci, NCCOS)
GARFO and NOAA National Centers for Coastal Ocean Science update on revised siting for Blue Water Fisheries offshore aquaculture project

12:30 p.m. **Lunch Break**

1:45 **Open Period for Public Comment**
Opportunity for the public to provide brief comments on issues relevant to Council business but not listed on this agenda (please limit remarks to 3-5 minutes)

2:00 **Herring Committee Report** (Cheri Patterson)
Amendment 10: update on action to minimize user conflicts in the Atlantic herring fishery; review draft scoping document and scoping meeting schedule

4:00 **Congressional Update** (Dave Whaley)
Update on legislative activities; Council questions

5:00 **Council Adjourns**

6:00 **Council Public Outreach** (AC Hotel, Lobby Level, 299 Vaughn Street, 4-minute walk from the Council meeting room at The Venue at Portwalk Place)
Informational exchange to foster open lines of communication among Council members, staff, industry, and meeting attendees; all are welcome; light snacks provided

Wednesday, January 31, 2024

9:00 a.m. **Standardized Bycatch Reporting Methodology** (Staff)

Presentation on three-year review of the Northeast Region's Standardized Bycatch Reporting Methodology

9:45 **NEFSC Fishery Monitoring and Research Division** (Katherine "KB" McArdle and Dr. Anna Mercer, NEFSC)
Report on Northeast Fishery Monitoring and Research Division activities, including: (1) status of ongoing responsibilities; (2) at-sea monitoring and observer program activities; and (3) cooperative research updates

11:45 **Industry-Based Surveys** (Dr. Kathryn Ford, NEFSC)
Overview of Northeast Fisheries Science Center white paper outlining potential plans for industry-based surveys to complement federal spring and fall bottom trawl surveys on the *Henry B. Bigelow*; Council input on research priorities for consideration in future industry-based survey

12:30 p.m. **Lunch Break**

1:45 **Marine Recreational Information Program Fishing Effort Survey** (Dr. Katherine Papacostas, NOAA Fisheries)
NOAA Fisheries presentation on Marine Recreational Information Program (MRIP); update on status of Fishing Effort Survey (FES)

2:45 **Groundfish Committee Report** (Rick Bellavance)
Recreational Measures: provide recommendations to GARFO on fishing year 2024 recreational measures for Georges Bank cod, Gulf of Maine cod, and Gulf of Maine haddock; Atlantic Cod Management Transition Plan: update; Metrics for Amendment 23 Monitoring System Review: progress report; 2024 Groundfish Priorities: update on workplan for year ahead

4:45 **Whiting Report** (Rick Bellavance)
Revisit fishing year 2024-2026 specifications approved in December 2023 for small-mesh multispecies (whiting) fishery to address southern red hake rebuilding

Thursday, February 1, 2024

9:00 a.m. **Spiny Dogfish Committee** (Nichola Meserve, NEFMC committee co-chair; Jason Didden, MAFMC staff)
Review, discuss, and approve fishing year 2024-2026 spiny dogfish specifications

10:00 **Monkfish Report** (Matt Gates)
Framework 15: progress report on joint New England/Mid-Atlantic Council action to reduce monkfish/dogfish large-mesh gillnet fishery interactions with Atlantic sturgeon

11:30 **On-Demand Fishing Gear Conflict Working Group** (Mike Pierdinock)
Update on working group activities to prevent or reduce potential gear conflicts between mobile, fixed, and recreational gear and on-demand or ropeless fishing gear

12:00 p.m. **Black Sea Bass Research Track Stock Assessment** (Dr. Larry Alade, NEFSC)
Presentation on peer-reviewed 2023 Black Sea Bass Research Track Stock Assessment

12:30 **Other Business**

Times listed next to the agenda items are estimates and are subject to change.
This meeting is being held in person and by webinar. Council member financial disclosure forms are available for examination on the Council website.

Although other non-emergency issues not contained on this agenda may come before this Council for discussion, those issues may not be the subject of formal action during this meeting. Council action will be restricted to those issues specifically listed in this notice and any issues arising after publication of this notice that require emergency action under section 305 (c) of the Magnuson-Stevens Act, provided the public has been notified of the Council's intent to take final action to address the emergency.

Documents pertaining to Council actions are available for review prior to a final vote by the Council.
Please check the Council's website, www.nefmc.org, or call (978) 465-0492 for copies.
This meeting will be recorded. Consistent with 16 USC 1852, a copy of the recording is available upon request.

SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

4055 Faber Place Drive, Suite 201, North Charleston SC 29405
Call: (843) 571-4366 | Toll-Free: (866) SAFMC-10 | Fax: (843) 769-4520 | Connect: www.safmc.net

Carolyn N. Belcher, Ph.D., Chair |Trish Murphey, Vice Chair
John Carmichael, Executive Director

Draft Agenda

Villas by the Sea Resort
1175 N. Beachview Drive
Jekyll Island, GA 31527

March 4-8, 2024

Except for advertised (scheduled) public hearings and public comment sessions, the times indicated on the agenda may be adjusted as necessary to accommodate the completion of agenda items. Interested parties should be aware that meetings may start earlier or later than indicated.

Hybrid Public Comment Session:
The public comment session for the meeting (March 6, 2024, at 4 PM), will allow for both in-person and remote (via webinar) verbal public comment. Individuals intending to provide verbal public comment remotely are asked to sign-up at the following link: [LINK]. Members of the public intending to provide verbal public comment in-person will be asked to sign-in at the meeting.

Written Comments:
To submit written comment on items on this agenda, visit the online public comment form: [LINK]
Written comments will be accepted from February 16 to March 8, 2024. These comments are accessible to the public, part of the Administrative Record of the meeting, and immediately available for Council consideration.
View submitted written comments at: [LINK]

Written comments submitted by mail/fax received by close of business the Monday before the meeting (February, 25 2024) will be compiled, posted to the website as part of the meeting materials, and included in the administrative record.

From February 26 to 5 PM on March 8, written comments must be submitted electronically through the online public comment form at the link above.

Monday, March 4, 2024 COUNCIL SESSION

COUNCIL SESSION I /Belcher 1:30 pm – 5:00 pm

- Approve agenda
- Approve minutes (December 2023)

1. Reports:
    a. NOAA Office of Law Enforcement
    b. US Coast Guard
    c. Council liaisons
    d. State agencies

2. Inflation Reduction Act (IRA) Projects Update – John Carmichael

3. NMFS Presentation on Equity and Environmental Justice – TBD, NMFS HQ

4. Best Fishing Practices Update
    a. Master Volunteer Program
    b. 'What It Means to Me' Project

5. Stakeholder engagement meetings update

6. Law Enforcement Advisory Panel (AP) Recommendations on items not on the agenda – Capt. Scott Pearce, Chair

Tuesday, March 5, 2024 COUNCIL SESSION

COUNCIL SESSION I/Belcher 8:30 am – 12:00 noon

7. Potential Modifications to the Southeast For-Hire Integrated Electronic Reporting (SEFHIER) Program
    a. Law Enforcement AP Recommendations – Capt. Scott Pearce
    b. SEFHIER program update – NMFS SERO
    c. Charter Vessel Reporting Compliance in South Carolina – Amy Dukes, SCDNR
    d. Southeast Region Headboat Survey Reporting Compliance – TBD, SEFSC

8. Consideration of Limited-Entry in South Atlantic For-Hire Fisheries
    a. Overview of available information and preliminary data

12:00 noon to 1:30 pm Lunch

Tuesday, March 5, 2024 COMMITTEE MEETINGS

Mackerel Cobia Committee/Roller 8:30 am – 10:00 am

- Approve agenda
- Approve minutes (December 2023)

1. Law Enforcement Advisory Panel (AP) Recommendations – Capt. Scott Pearce

2. Mackerel Port meetings
    a. Approve plan for 2024 meetings

SEDAR Committee/Belcher 10:00 am – 12:00 noon (CLOSED)

- Approve agenda

- Approve minutes (December 2023)

1. System Management Plan Workgroup and SEDAR appointments

12:00 noon to 1:30 pm Lunch

Snapper Grouper Committee/McCawley 1:30 pm – 5:00 pm

- Approve agenda
- Approve minutes (December 2023)
- Briefing on exempted fishing permit (EFP) applications – NMFS SERO
- Presentation on projections for 2024 recreational seasons for red snapper and gag – NMFS SERO

1. Wreckfish (Amendment 48)
    a. Wreckfish Sub-Committee report
    b. Approve for public hearings

2. Gag and Black Grouper Vessel Limit and On-Demand Gear for Black Sea Bass (Regulatory Amendment 36)
    a. Law Enforcement AP Recommendations – Capt. Scott Pearce
    b. Review scoping comments

3. Black Sea Bass (Amendment 56)
    a. Assessment presentation – TBD, SEFSC
    b. Scientific and Statistical Committee Recommendations – Dr. Jeff Buckel, Chair

Wednesday, March 6, 2024 COMMITTEE MEETINGS

Snapper Grouper Committee/McCawley 8:30 am – 12:00 noon

4. Private Recreational Permit and Education Requirement (Amendment 46)
    a. Law Enforcement AP Recommendations – Capt. Scott Pearce
    b. Consider modifications to actions

5. Scamp/Yellowmouth Grouper (Amendment 55)
    a. Review preliminary analyses

12:00 noon to 1:30 pm Lunch

Snapper Grouper Committee/McCawley 1:30 pm – 3:45 pm

6. Red Snapper (Regulatory Amendment 35)
    a. Consider modifications, additional actions

Wednesday, March 6, 2024 PUBLIC COMMENTS

4:00 pm

Public comment will be accepted from individuals attending the meeting (in-person and remotely) regarding any of the items on the Council agenda. The Council Chair, based on the number of individuals wishing to comment, will determine the amount of time provided to each commenter. Those intending to provide verbal public comment via webinar can sign-up here: [LINK]

- Exempted Fishing Permit(s) (if any)

Thursday, March 7, 2024 COMMITTEE MEETINGS

Snapper Grouper Committee/McCawley 8:30 am – 12:00 noon

7. Management Strategy Evaluation Update – Blue Matter Science
    a. SSC Recommendations – Dr. Jeff Buckel

8. Overview of Commercial Permits

9. Agenda topics for March 2024 Advisory Panel Meeting

12:00 noon to 1:30 pm Lunch

Thursday, March 7, 2024 COUNCIL SESSION

COUNCIL SESSION II/Belcher 1:30 pm – 5:00 pm

- Litigation Brief (if needed)

1. Staff Report

2. Agency reports
    a. NMFS Southeast Regional Office Report – NMFS SERO
    b. NMFS Southeast Fisheries Science Center Report – NMFS SEFSC

3. Council workplan

4. Upcoming meetings

COUNCIL SESSION II/Belcher 8:30 am – 12:00 noon

- Committee reports

Other business

Adjourn

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: January 26, 2024

To: Council

From: Chris Moore, Executive Director

Subject: Legal Review, Financial Disclosure, and Recusal Training

On Tuesday, February 7, the NOAA Office of General Counsel will provide a briefing on the Magnuson-Stevens Act financial disclosure and recusal requirements, as well as a review of the litigation process for Council actions. More information is provided in the attached FAQs and at the links below.

- 50 CFR § 600.2335 – Financial Disclosure and Recusal Regulations
- Policy Directive 01-116-01 – Procedures for Review of Financial Disclosures and Recusal Determinations
- NOAA Office of General Counsel, Northeast presentation

https://www.fisheries.noaa.gov/partners/frequent-questions-financial-disclosure-and-financial-interests-form

Frequent Questions: Financial Disclosure and Financial Interests Form

Council nominees and members of the Science and Statistical Committees must file a Statement of Financial Interests to fulfill the requirements of the MSA. Learn more about these requirements below.

What fishing-related financial or ownership interests do I report on the Statement of Financial Interests form?

You are required to report any ownership or financial interest in a "harvesting, processing, lobbying, advocacy, or marketing activity." This includes charter boat related activities. You also must report fishing related ownership or financial interests held by your spouse, minor child, or partner.

List on the financial interest form any ownership or financial interest in a "harvesting, processing, lobbying, advocacy, or marketing activity" that is being or will be undertaken within any fishery over which your council has jurisdiction. Report all of the following:

- Stock, equity, and/or ownership interests in any company or business engaged in a harvesting, processing, lobbying, advocacy, or marketing activity.
- Stock, equity, and/or ownership interests in fishing vessel(s), including equity or ownership
  interest in the vessel(s), engaged in a harvesting, processing, or marketing activity.
- Stock, equity, and/or ownership interests in any company that provides equipment or other services essential to a harvesting, processing, lobbying, advocacy, or marketing activity.

What fishing-related employment interests do I report on the Statement of Financial Interests form?

You are required to report any employment interest in a "harvesting, processing, lobbying, advocacy, or marketing activity." This includes employment with any organization or association (other than the council). You must also report fishing related employment of your spouse, minor child, or partner. List on the form any employment interest in a "harvesting, processing, lobbying, advocacy, or marketing activity" that is being or will be undertaken within any fishery over which the council has jurisdiction.

Report employment with any:

- Company or business engaged in a harvesting, processing, or marketing activity.
- Fishing vessel engaged in a harvesting, processing, or marketing activity.

- Equipment company or company that provides other services essential to a harvesting, processing, or marketing activity.
- Firm providing consulting, legal, or representational services to an entity engaged in, or providing equipment or services essential to, a harvesting, processing, or marketing activity, including a firm engaging in lobbying or advocacy services in any fishery under the jurisdiction of your council.

Additionally, you must report employment with any association whose members include companies, vessels, or other entities engaged in harvesting, processing, lobbying, advocacy, or marketing activities. You must report employment with a company providing services to harvesting, processing, or marketing activities, or an organization engaged in lobbying or advocacy with regard to any fishery under the jurisdiction of your council.

Do I have to include membership or service with an association on my financial interest form?

You must report memberships or service with associations or organizations whose members include companies, vessels, or other entities engaged in harvesting, processing, lobbying, advocacy, or marketing activities. You must also report membership to an organization engaged in lobbying or advocacy with regard to any fishery under the jurisdiction of your council. This MUST include any service as an officer, director, or trustee of an association, including companies that provide services to harvesting, processing, or marketing activities. You must also report membership or service held by your spouse, minor child, or partner.

What happens if I do not file my form within the time stated on Page 1 of the form?

For currently appointed council members, if you do not file a timely, complete, accurate, and up-to-date form as required by regulations, you may be subject to criminal and/or civil penalties. And if you participate in matters affecting an undisclosed harvesting, processing, lobbying, advocacy, or marketing activity, you may be subject to criminal and/or civil penalties. The financial interest forms are an integral part of the system for exempting you from certain provisions of a criminal conflict of interest statute. If you are a voting member of a council, appointed by the Secretary, you must file a form with the executive director of your council within 45 days of taking office. You also must file an updated form with the executive director of your council within 30 days of the time any new financial interest is acquired or substantially changed by you or your spouse, partner or minor child. You also must file an updated form with the executive director of your council by February 1 of each year regardless of whether any information has changed on your form.

What if I knowingly withhold some information on my form?

Knowing and willful failure to disclose, or falsification of, information required to be reported may subject you to criminal prosecution or subject you to civil penalties. It is unlawful for an affected individual to knowingly and willfully fail to disclose, or to falsely disclose, any financial interest as required by the MSA, or to knowingly vote on a council decision in violation of this Act. In addition to the criminal penalties applicable, a violation of this provision may result in removal from council membership.

What is considered a council decision?

A council decision primarily includes an approval of a fishery management plan (FMP) or FMP amendment (including any proposed regulations). Council decisions also include requests for an amendment to regulations implementing an FMP; finding that an emergency exists involving any fishery (including recommendations for responding to the emergency); and comments to the Secretary on FMPs or amendments developed by the Secretary. Council decisions do not include a vote by a committee of a council.

What if I have a financial interest with regard to a fishery under the jurisdiction of my council?

Public disclosure is the method for a member of a fishery management council to resolve a potential conflict with regard to most financial interests in fishery related harvesting, processing, lobbying, advocacy, or marketing activities. Restrictions on voting are not always required, except as identified in 50 CFR 600.235(c). Generally, you are only restricted from voting on a council decision that would have a significant and predictable effect on your disclosed financial interests, or on the disclosed financial interests of your spouse, minor children, or general partners.

If I believe I have a conflict of interest, can I voluntarily recuse myself?

Yes, if you believe that a council decision would have a significant and predictable effect on your financial interests, you may, at any time before a vote is taken, announce your intent not to vote on the decision. You may still participate in council deliberations.

When is recusal from voting on a council action mandatory?

You cannot participate fully as a council member on a matter that will affect your financial interests (or those interests of your spouse, partner, or minor child) when:

- A council decision will have an expected and substantially disproportionate benefit (see question 13 below) to your financial interests (or those interests of your spouse, partner, or minor child).
- A council action involves a matter primarily of individual concern (see question 14 below) to your financial interests (or those interests of your spouse, partner, or minor child).
- A council action affects a fishing related financial interest of yours that you have not reported on your financial interest form.

What is the scope of a recusal on voting? What am I not allowed to do if there is a conflict?

If you or the designated official determines that you cannot vote on a council decision, you can participate in deliberations but must first notify the council that you will not be voting on the matter and identify the financial interest that would be affected. You cannot vote or participate in deliberations regarding a matter primarily of individual concern that will affect your interests (or those whose interests that are attributable to you, such as spouse, partner or minor child). Your participation in an action by a council during any time in which you are not in compliance with the regulations may not be treated as cause for the invalidation of that council action.

Who determines whether my financial interests require my recusal from voting on a council decision?

You can independently conclude that a council decision would have a significant and predictable effect on your financial interests and as such you are recused from voting on the matter. You may also request a determination from the designated official as to whether a council decision would have a significant and predictable effect on your financial interests. The designated official for your council is an attorney from the regional NOAA General Counsel's office that works with your council. The designated official uses the member's form and other information to make a determination. The councils, NOAA General Counsel and the NOAA Fisheries Service Regional Offices regularly communicate to implement these regulations. If a council member would like to appeal a determination, the member may file a written request to the NOAA General Counsel for review of the designated official's determination within 10 days of the determination.

Does NOAA keep a record of council member recusals?

Yes, the councils and the NOAA Fisheries Regional Offices maintain records of financial disclosure statements. NOAA Fisheries submits a Report to Congress annually on actions taken by the Secretary and councils to implement the disclosure of financial interest and recusal requirements of the MSA. This includes identifying any conflict of interest problems and recommendations for addressing any such problems.

How is a "significant and predictable effect on a financial interest" determined?

A "significant and predictable effect on a financial interest" exists if an expected and substantially disproportionate benefit to the member's financial interest is closely linked to the council decision. A council action will have an "expected and substantially disproportionate benefit" to you if you (or those whose interests are attributed to you) have:

- A greater than 10 percent interest in the total harvest of the fishery (or the sector of the fishery) that is under consideration by the council.
- A greater than 10 percent interest in the marketing or processing of the total harvest of the fishery (or sector of the fishery) that is under consideration by the council.
- Full or partial ownership of more than 10 percent of the vessels using the same gear type within the fishery (or sector of the fishery) that is under consideration by the council.

Interests of your spouse, minor children, general partners, non-federal employers, and entities with which you are seeking employment and any organization in which you serve as an officer, director, or trustee are attributed to you.

The percentage of interest will be determined with reference to the most recent fishing year for which information is available, except that for fisheries in which Individual Fishing Quotas (IFQs) are assigned, the percentage of IFQs assigned will be determinative. If you believe that these provisions require your disqualification from a matter, you should announce your recusal from voting before council deliberations on the matter. If you have any questions regarding the application of the rules to your situation, you may seek advice from the NOAA Regional Attorney who advises your council (or an attorney in the Ethics Law and Programs Division of

the U.S. Department of Commerce). If you would like a determination as to whether an interest requires your recusal from voting, you may seek such a determination from the NOAA Regional Attorney who advises your council.

What are "matters primarily of individual concern"?

"Matters primarily of individual concern" are those matters that affect a small number of identified, or easily identifiable, parties, rather than broad policy matters affecting many entities. For example, a contract between your council and a company that employs you would be a matter primarily of individual concern for you. Thus, you would be disqualified from participating in any council action regarding the contract, even if the company was listed on your financial interest form. An FMP would usually be considered a broad policy matter, rather than a matter primarily of individual concern.

However, if a fishery had only a few active vessels and you owned one of those vessels, an FMP regarding that fishery would be a matter primarily of individual concern. You would be required to disqualify yourself from participating in matters concerning the plan. If you have any questions regarding the application of the rules to your situation, you should seek advice from the NOAA Regional Attorney who advises your council (or an attorney in the Ethics Law and Programs Division of the U.S. Department of Commerce).

Can I sign my form electronically and to whom do I submit my form?

If allowed by the requesting authority, nominees and members can submit their forms electronically via email, but you will need to print and sign the form for the official filing.

- For council nominees, your form must be initially filed with the state governor's office which nominated you to the council. Each nominee should ensure that a final complete form is filed with the Assistant Administrator by April 15 or, if nominated after March 15, 1 month after nomination by the governor. Nominees may contact NOAA Fisheries at (301) 427-8500 with questions.
- For seated members, the form must be filed with the executive director of the appropriate council within 45 days of taking office; and must file an update with the executive director of the appropriate council within 30 days of the time any such financial interest is acquired or substantially changed.
- All council members must file this form annually by February 1st regardless of whether any information on the form has changed.
- For SSC nominees and members, you must file this form with the Regional Administrator for the geographic area concerned within 45 prior to appointment. You must file an update with the Regional Administrator for the geographic area concerned within 30 days of the time any such financial interest is acquired or substantially changed. All SSC members must file this form with the Regional Administrator annually by February 1st regardless of whether any information on the form has changed.

If I have other questions not on this list, who can I talk to?

NOAA Fisheries encourages you to speak with your executive director, regional NOAA General Counsel, or NOAA Fisheries Regional Office with any questions. Please note that the requirements discussed in this FAQ are also included by NOAA Fisheries among the topics covered in its annual training of council members.

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: January 25, 2024

To: Council

From: Julia Beaty, staff

Subject: Updates on Offshore Wind Energy Development

On February 7, 2024, the Council will receive updates on the following offshore wind energy topics:

- **Bureau of Ocean Energy Management (BOEM)** staff will provide an update on several topics, which may include, but is not limited to:
    - The proposed sale notice for two new Central Atlantic lease areas, one off Delaware/Maryland and one off Virginia.
    - The draft environmental assessment for leasing, site assessment, and site characterization activities in the Central Atlantic.
    - Next steps for consideration of additional lease areas in the Central Atlantic.
    - The draft programmatic environmental impact statement for the New York Bight leases.
    - Next steps for finalization of BOEM's guidance for fisheries mitigation.
    - Recent approvals for the commercial scale Coastal Virginia Offshore Wind project and Empire Wind.
    - The NOAA and BOEM North Atlantic Right Whale and Offshore Wind Strategy.
- **State working group on a regional fisheries compensation fund administrator**
    - Kris Ohleth, executive director of the Special Initiative on Offshore Wind will provide an update on an initiative led by eleven east coast states to establish a regional fund administrator for fisheries compensatory mitigation. More information is available here.
- The Council will also receive presentations on the following offshore wind energy projects:
    - **South Fork Wind** (currently in construction off Massachusetts/Rhode Island). This presentation will focus on the fisheries compensatory mitigation fund.

- **Vineyard Wind 1** (currently in construction off Massachusetts), with a focus on the fisheries compensatory mitigation fund. A short summary of the Vineyard Wind 1 fisheries compensatory mitigation program is available behind this tab.
- **Kitty Hawk Wind** (off North Carolina, currently in the planning stages). A fact sheet on Kitty Hawk Wind is included behind this tab.
- **Community Offshore Wind** (off New Jersey, currently in the planning stages).

The following additional updates are provided for informational purposes, but are not expected to be addressed in presentations during the Council's October meeting:

- **Comment letters in progress**. Mid-Atlantic and the New England Council staff are working on joint comment letters for the Central Atlantic proposed sale notice (comment period ends February 10, 2024) and the New York Bight draft programmatic environmental impact statement (comment period ends February 26, 2024).
- The New Jersey Board of Public Utilities selected two offshore wind projects, Leading Light Wind and Attentive Energy Two, to provide a total of 3,742 MW of offshore wind capacity through the state's third offshore wind energy solicitation. More information is available here.
- Ørsted has withdrawn from the Maryland Public Service Commission Orders approving the Skipjack Wind 1 and 2 projects, stating that "the payment amounts for [offshore renewable energy credits] set forth in the Orders are no longer commercially viable because of today's challenging market conditions, including inflation, high interest rates and supply chain constraints." Ørsted will seek to negotiate new offtake agreements for Skipjack 1 and 2 through future solicitations. More information is available here."
- Ørsted and Eversource submitted a new bid to the New York State Energy Research and Development Authority (NYSERDA) for the Sunrise Wind project. If selected through New York's current offshore wind solicitation, this would replace the existing contract for Sunrise Wind. If not selected, this would cancel the previous agreement with NYSERDA. More information is available here.
- The Regional Wildlife Science Collaborative for Offshore Wind released the Integrated Science Plan for Offshore Wind, Wildlife, and Habitat in U.S. Atlantic Waters. This plan includes recommendations for data management, collection, and analysis across wildlife species groups and topics (including marine mammals, birds, bats, sea turtles, protected fish, oceanography, seafloor habitat, and technology).
- **Construction activities.** The following projects have been approved by BOEM. Construction and pre-construction activities are underway or may take place in the near future.
    - **Vineyard Wind 1**. The 62 turbine Vineyard Wind 1 project, located 15 miles south of Martha's Vineyard and Nantucket, is currently under construction. The most recent notices to mariners regarding construction activities are available here.
    - **South Fork Wind**. The 12 turbine South Fork Wind project, located approximately 19 miles southeast of Block Island and 35 miles east of Montauk Point, is currently under construction. For the most recent notices to mariners regarding construction activities, see the Northeast mariners briefings posted here.

- **Revolution wind.** The up to 65 turbine Revolution Wind Projected, located about 15 nautical miles southeast of Point Judith, Rhode Island, is currently in construction. For the most recent notices to mariners regarding construction activities, see the Northeast mariners briefings posted here.
- **Coastal Virginia Offshore Wind** (CVOW). The up to 176 turbine CVOW project, located about 24 nautical miles off Virginia Beach, has been approved but offshore construction activities have not yet begun. The most recent notices to mariners are available here.
- **Empire Wind.** The up to 147 turbine Empire Wind project, located about 12 nautical miles south of Long Island, has been approved but offshore construction activities have not yet begun. The most recent notices to mariners are available here.
- Although Ørsted announced they would cease development of the approved Ocean Wind 1 and 2 projects off New Jersey, the company is continuing work on construction an operations and maintenance facility in Atlantic City, NJ. This includes the installation of pontoons, or floating docks, which will extend into Clam Creek. More information is available in the Mid-Atlantic mariners briefings posted here.

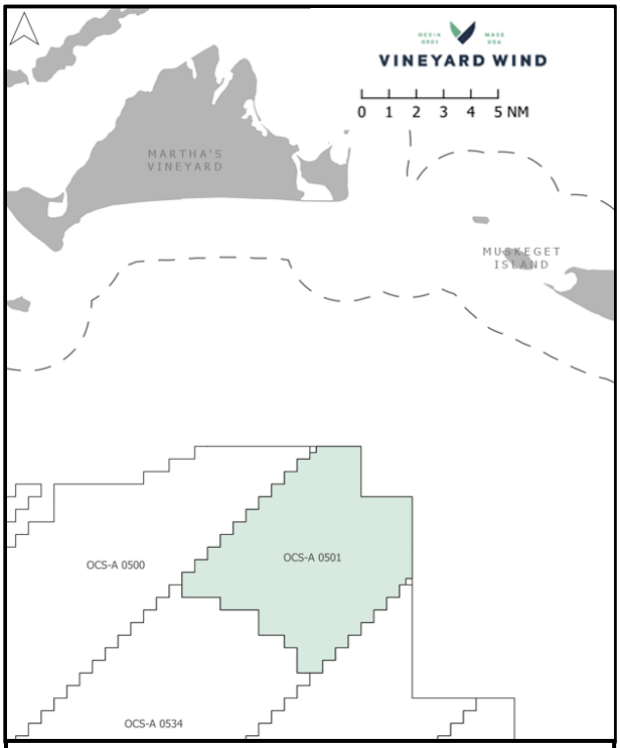
- **Ongoing survey activities (geotechnical, geophysical, fisheries, etc.)**. Several offshore wind projects are undertaking geophysical, geotechnical, fisheries, and other types of survey work throughout the region. These surveys use a variety of gear types, including some equipment that is left in place for extended periods of time (e.g., buoys, acoustic receivers). The best way to stay informed of these survey activities is to sign up for email updates from individual wind developers (see the project specific links available here).
- **Fisheries liaison outreach**. Fisheries liaisons for most offshore wind projects periodically host port hours, dock visits, and other outreach events. The best way to stay informed of these events is to sign up for email updates from individual wind developers (see the project specific links available here).
- **Stay informed**. To stay up to date on individual wind projects, including development of fishery communications plans, details on offshore survey operations, outreach events, and other updates, see the project-specific links available at https://www.mafmc.org/offshore-wind-notices.

OCS-A 0501 MASS USA

VINEYARD WIND

Vineyard Wind 1 Fisheries Compensatory Mitigation Program

Vineyard Wind 1 LLC is constructing an 800 MW offshore wind project located in federal Lease Area OCS-A-0501 approximately 15 miles south of Martha's Vineyard and Nantucket. The lease area (also referred to as the Wind Development Area of WDA) is approximately 63,000 acres where 62 wind energy turbines and one electrical platform will be installed in a grid pattern spaced one nautical mile apart in a north/south/east/west direction.



Vineyard Wind 1 WDA (green shaded area) within federal Lease Area OCS-A 0501

Vineyard Wind has created a fisheries compensatory mitigation program with a primary objective to provide fair, equitable compensation to commercial fishermen for economic losses attributable to Vineyard Wind 1's construction, operations, and decommissioning activities.

Three escrow funds have been established to compensate affected fishermen in Massachusetts, Rhode Island, and Other States (Connecticut, New Jersey, and New York). Compensation may also be available to fishing businesses (i.e., shoreside businesses) in Massachusetts.

For commercial fishermen, the first phase of the program will be the eligibility phase, which will require commercial fishing vessel owners to qualify for compensation payments based on defined eligibility criteria. Once qualified, a commercial vessel owner may elect to participate in either an expedited claims process or a regular claims process, both of which are based on a commercial fishing vessel owner's historic revenue dependence on the WDA but require different levels of documentary proof. Fishermen will not need to demonstrate economic impacts from Vineyard Wind 1 in order to qualify for the program or receive compensation payments.

The Vineyard Wind 1 Fisheries Compensatory Mitigation Program is scheduled to be launched in January 2024. Information about the third-party administrator, the program, and how to apply will be available on the program's website: www.vw1fisheriescomp.com. Once the program launches, commercial fishermen will be able to apply to the program to establish eligibility. The program's eligibility criteria for commercial fishing vessel owners is provided on the following page.

OCS-A 0501 MASS USA

VINEYARD WIND

Eligibility Criteria for Fishermen

- Commercial fishing vessel owners/operators homeported in Massachusetts, Rhode Island, Connecticut, New Jersey, or New York

- Valid 2023 commercial fishing permit from NOAA Fisheries

- Current government-issued vessel registration showing ownership, or a vessel lease agreement

- Documented fishing activities within the WDA in at least three of the last seven years of the baseline period (2016-2022). Fishing activities can be established by submitting information that includes, but is not limited to, the following:

    - Vessel Trip Reports
    - Vessel Monitoring System information
    - AIS information
    - Fishery observer or At-Sea Monitor information
    - NOAA Cooperative Research Study Fleet information
    - Chart plotter data/images
    - Logbooks
    - Other trip level reporting information that establishes fishing activity in the WDA

- Documented annual revenue from fishing activities in the corresponding three years. Annual revenues can be established by submitting information that includes, but is not limited to, the following:

    - Internal Revenue Service Form 1099 and/or other tax documents that include reported income
    - Sales receipts
    - Dealer slips
    - Dealer compilation reports
    - Other income information that establishes income from fishing activities

700 Pleasant Street, Suite 510, New Bedford, MA 02740
TEL 508.717.8964 EMAIL info@vineyardwind.com
VINEYARDWIND.COM

Tour Kitty Hawk Wind

Kitty Hawk Wind
Avangrid

Project Overview

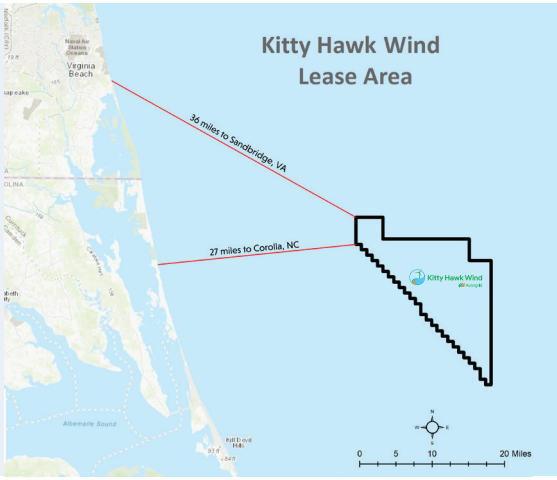
Avangrid, a national offshore wind leader, is developing the Kitty Hawk Wind project off the coasts of Virginia and North Carolina. The project will provide enough clean, renewable energy to power more than 1 million homes while creating jobs and bringing economic investment to the region.

At a Glance:

- ~3,500 megawatts of clean energy
- ~1 million homes powered
- $2 billion economic impact
- Creating an average of 800 jobs annually
- Commercial operation in late 2020s

Location

- The Kitty Hawk Wind project is located in federal waters 36 miles from its proposed landfall location in Virginia Beach, VA and 27 miles off the coast of North Carolina's Outer Banks.
- The lease area was delineated by the U.S. Bureau of Ocean Energy Management (BOEM) after a 4-year stakeholder process.
- Through a competitive auction conducted by BOEM in 2017, Avangrid secured an offshore lease area to develop the Kitty Hawk Wind project.



Renewable Energy

Why Now?
Kitty Hawk Wind will play an important role in meeting the ambitious clean energy targets set by Virginia, North Carolina, and the federal government. Offshore wind delivers a triple-win for our climate, our communities, and our workforce.

The project is projected to support up to 3,500 megawatts of clean electricity generation, enough to power approximately 1 million homes.

$2 Billion
of economic impact to be generated by Kitty Hawk Wind in the next decade.

800 Jobs
created in Virginia and North Carolina annually on average during construction.

$100 Million
in additional income and sales tax revenues generated in the next decade.

These economic impact totals come from a detailed economic analysis conducted in 2019 by an industry-leading organization for the development, construction and maintenance of the entire Kitty Hawk Wind project.

Local Economic Benefits

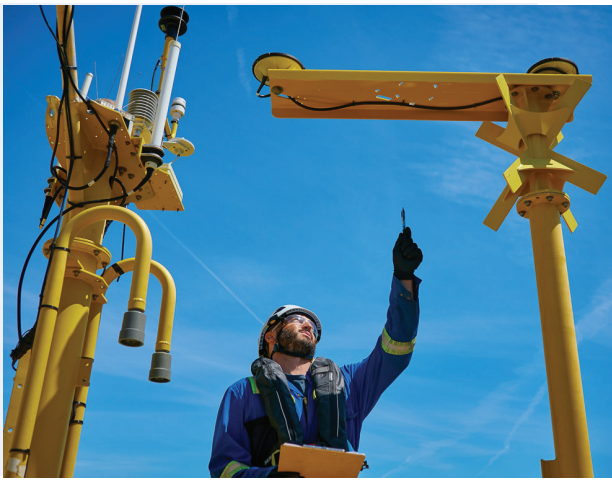
- During construction anticipated spending in Virginia and North Carolina will be $1.5 billion.
- Once construction begins, the project will create an annual average of 800 jobs in Virginia and North Carolina, with net household earnings increase of $390 million.
- Once fully operational, the project is expected to support approximately 900 jobs in the region on an ongoing basis.

Stakeholder Outreach

- In 2020, Avangrid opened an office in Virginia Beach to support the development of the Kitty Hawk Wind project and ignite this new industry off the coasts of Virginia and North Carolina.
- Avangrid continues to engage regularly with officials from the U.S. Department of Defense (DOD) on this project to ensure DOD's vital national security mission is not compromised.
- Commercial and recreational fishing will be allowed throughout the project area. The project's excellent siting and use of local knowledge to inform the project design will ensure the project's successful coexistence with commercial and recreational fishing activities.
- Since 2017, Avangrid has been consulting with community leaders and organizations and studying the lease area to minimize impacts to natural resources and ocean users.

Responsible Development

- Kitty Hawk Wind is committed to responsibly sharing the ocean environment.
- Extensive assessments, studies, and surveys are conducted prior to any construction to ensure the project is developed responsibly and in compliance with BOEM through the National Environmental Policy Act process.
- Assessments include: Marine Mammal and Sea Turtle Assessments; Navigation Safety Risk Assessment; Commercial and Recreational Fishing Assessment; Environmental Justice; Offshore Bats and Birds Assessments; Threatened and Endangered Species Evaluation and more.



Connection to the Grid

- Subsea cables, already commonly in use worldwide to transmit power, will connect Kitty Hawk Wind to the electric grid.
- Currently the landfall for the north portion of Kitty Hawk Wind is anticipated at Sandbridge, VA, following a designated corridor to the new onshore substation within Corporate Landing Business Park.
- During construction, Kitty Hawk Wind will use best management practices and implement mitigation measures that will be least disruptive to the community and environment.

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
P. Weston Townsend, Chairman | Michael P. Luisi, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: January 22, 2024

To: Council

From: Brandon Muffley and Julia Beaty, Council staff

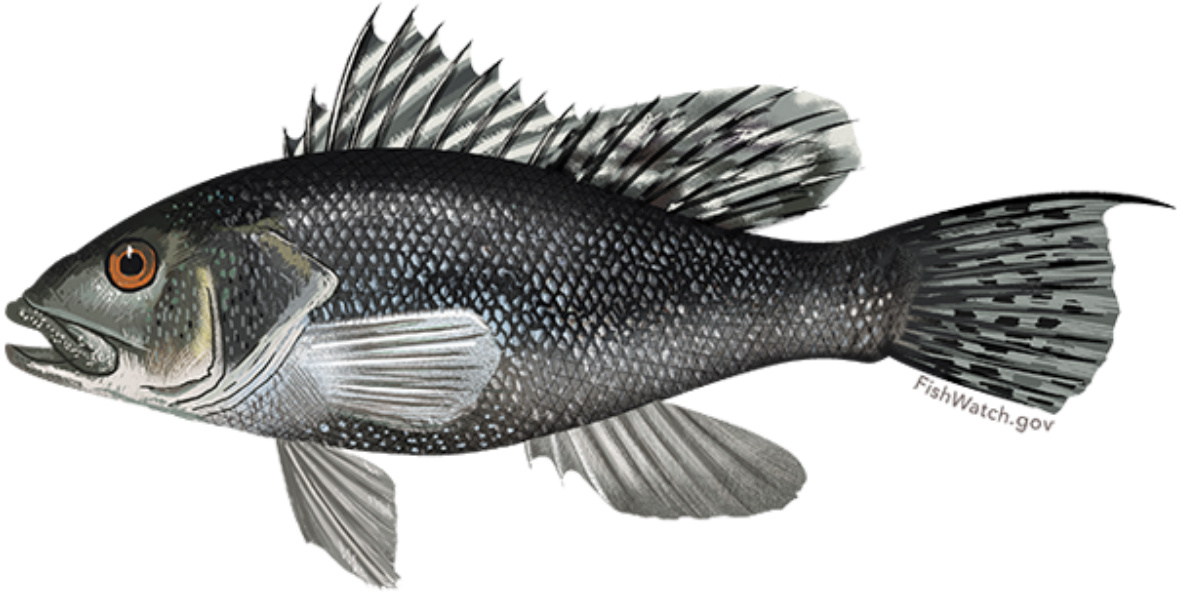
Subject: Meeting Materials – Black Sea Bass Research Track Stock Assessment

On Wednesday, February 7, 2024, the Northeast Fishery Science Center (NEFSC) will provide the Mid-Atlantic Fishery Management Council (Council) with an overview of the recently completed research track stock assessment and peer review for black sea bass. The newly approved stock assessment will be updated with information through 2023 as part of the management track peer review in June 2024. Results from the June management track review will be used to inform management and future catch specifications.

Materials listed below are provided for Council consideration of this agenda item.

- 2023 Report of the Black Sea Bass Research Track Working Group Report – Executive Summary
    - The full working group report can be found at: Stock Assessment Support Information (SASINF) Search Tool
- Summary Report of the Black Sea Bass Research Track Stock Assessment Peer Review

Report of the Black Sea Bass (*Centropristis striata*) Research Track Stock Assessment Working Group



November 20, 2023

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PARTICIPANTS

Working Group

NAME	AFFILIATION	E-MAIL
Kiersten Curti	NEFSC	kiersten.curti@noaa.gov
Anna Mercer	NEFSC	anna.mercer@noaa.gov
Julia Beaty	MAFMC	jbeaty@mafmc.org
Gavin Fay	UMASSD-SMAST	gfay@umassd.edu
Marissa McMahan	Manomet	mmcmahan@manomet.org
Jason McNamee	RIDEM	jason.mcnamee@dem.ri.gov
Tim Miller	NEFSC	timothy.j.miller@noaa.gov
Sam Truesdell	NEFSC/MADMF	samuel.truesdell@noaa.gov
Ricky Tabendera	NEFSC/HCRI	ricky.tabandera@gmail.com

Contributors and Participants in Working Group Meetings

NAME	AFFILIATION	E-MAIL
Tracey Bauer	ASMFC	tbauer@asmfc.org
Gregory Bopp	NEFSC	gregory.bopp@noaa.gov
Jason Boucher	NEFSC	jason.boucher@noaa.gov
Krystina Braid	Stonybrook	krystina.braid@stonybrook.edu
Russ Brown	NEFSC	russell.brown@noaa.gov
Jeffrey Brust	NJDEP	Jeffrey.Brust@dep.nj.gov
Michael Celestino	NJDEP	mike.celestino@dep.nj.gov
Lisa Chong	MSU	chonglis@msu.edu
Steve Doctor	MDDNR	steve.doctor@maryland.gov
Greg DiDomenico	Lunds	gDiDomenico@lundsfish.com
Alexander Dunn	NEFSC	alexander.dunn@noaa.gov
Alexa Galvan	VMRC	alexa.galvan@mrc.virginia.gov

Remy Gatins	NEU	remygatinsa@gmail.com
Alex Hansell	NEFSC	alex.hansell@noaa.gov
Andy Jones	NEFSC	andrew.jones@noaa.gov
Scott Large	NEFSC	scott.large@noaa.gov
Bobby Lemeiux	Industry	bobbylemieux10@gmail.com
Chris Legault	NEFSC	chris.legault@noaa.gov
Emily Liljestrand	NEFSC	emily.liljestrand@noaa.gov
John Maniscalco	NYDEC	john.maniscalco@dec.ny.gov
Nichola Meserve	MADMF	nichola.meserve@mass.gov
Andie Painten	SMAST	apainten@umassd.edu
Willow Patten	NCDENR	willow.patten@ncdenr.gov
Maria Cristina Perez	SMAST	mperez12@umassd.edu
Michele Traver	NEFSC	michele.traver@noaa.gov
Abigail Tyrell	NEFSC	abigail.tyrell@noaa.gov
Hannah Verkamp	CFRF	hverkamp@cfrfoundation.org
Matthew Vincent	NOAA	matthew.vincent@noaa.gov
John Wiedenmann	Rutgers	john.wiedenmann@rutgers.edu
Rich Wong	DEDFW	Richard.Wong@delaware.gov
Paula Fratantoni	NEFSC	paula.fratantoni@noaa.gov

LIST OF ACRONYMS

ASAP	Age structured assessment program
ASM	At sea monitoring
B_{MSY}	Biomass at maximum sustainable yield
$B_{threshold}$	Biomass level defining an overfished state
ChesMMAP	Chesapeake Bay Multispecies Monitoring and Assessment Program
CPA	Catch per angler
CPUE	Catch per unit effort
CV	Coefficient of variation
F	Fishing mortality rate
F_{40}	Fully selected F achieving 40% of unfished spawning biomass per recruit
F_{MSY}	Fishing mortality rate at maximum sustainable yield
M	Natural mortality rate
MRIP	Marine Recreational Information Program
MSY	Maximum sustainable yield
NAFO	Northwest Atlantic Fisheries Organization
NEAMAP	Northeast Area Monitoring and Assessment Program
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCC	Northeast Regional Coordinating Council
OSA	One-step-ahead
SARC	Stock assessment review committee

SAW	Stock assessment workshop
SDC	Status determination criteria
SE	Standard error
SPR	Spawning biomass per recruit
SS	Stock synthesis modeling approach
SSB	Spawning stock biomass
SSC	Mid-Atlantic Fishery Management Council's Scientific and Statistical Committee
TOR	Term of reference
VAST	Vector Autoregressive Spatio-Temporal models
VIMS	Virginia Institute of Marine Science
VTR	Vessel trip report
WHAM	Woods Hole Assessment Model
YOY	Young of year

EXECUTIVE SUMMARY

The working group was formed in July 2021 and met over the following two years to address its terms of reference (TORs). This report represents consensus of the working group and includes contributions from working group members and participants.

TOR1: Ecosystem and Climate Influences

"*Identify relevant ecosystem and climate influences on the stock. Characterize the uncertainty in the relevant sources of data and their link to stock dynamics. Consider findings, as appropriate, in addressing other TORs. Report how the findings were considered under impacted TORs*."

The working group explored several avenues for integrating ecosystem considerations in the black sea bass stock assessment, which are described in TOR 1: Ecosystem and Climate Influences and in the Truesdell & Curti 2023b, Hansell & Curti 2023, Tabendera et al. 2023, McMahan & Tabendera 2023, McNamee 2023, and Mercer et al. 2023 working papers. In an effort to recognize the impact that climate change has on the biology of black sea bass, the working group evaluated and implemented time varying growth and maturity, developed new age-length keys that are regionally and seasonally specific (Truesdell & Curti 2023b working paper), and conducted spatiotemporal modeling with environmental covariates (Hansell & Curti 2023 working paper). The working group also evaluated ecosystem influences on black sea bass, which included a literature review and development of oceanographic indicators for black sea bass recruitment and mixing rates between regions (Tabendera et al. 2023 working paper). After careful consideration, the working group moved forward with integrating a bottom temperature covariate on recruitment in the stock assessment model. In addition, the working group explored black sea bass food habits and empirical approaches for estimating natural mortality, which suggested maintaining natural mortality at 0.4 (McMahan & Tabendera 2023 and McNamee 2023 working papers). Finally, the working group made a significant effort to gather ecological and fishery knowledge from black sea bass stakeholders through public events and one-on-one conversations. The information gleaned from this effort was critical for sense checking the data inputs and model outputs of the black sea bass stock assessment, and also contributed to the development of novel standardized catch per unit effort (CPUE) indices from the commercial trawl fleet (Mercer et al. 2023 working paper).

TOR2: Fishery Data

"*Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data*."

The working group's analysis of black sea bass fishery data and discard mortality are described in TOR 2: Fishery Data and in the Beaty et al. 2023, Curti et al. 2023a, Curti et al. 2023b, Truesdell & Curti 2023a, and Verkamp et al. 2023 working papers. For the commercial component of the black sea bass fishery, the primary gears used are otter trawls, pots, and

handlines (Curti et al. 2023a working paper). Over the commercial catch time series (1989-2021), trawl gears accounted for 45% of the commercial landings, pots and traps represented 41%, handlines accounted for 10% and other gears comprised the remaining 5%. Total commercial landings averaged approximately 1,240 mt through 2007, decreased to an average of 739 mt between 2008-2012 due to quota regulations, and generally increased from 2013 onward to a time series maximum of 2,013 mt in 2021 due to both population and regulatory changes. Over the course of the time series, the proportion of commercial landings that came from the northern region generally increased from an average of 24% through 2000 to a maximum of 83% in 2018.

Black sea bass commercial landings are distributed from Cape Hatteras to Cape Cod, with a concentration of landings inshore (<30m) representing the summer fishery, and a concentration of landings offshore representing the winter fishery (Curti et al. 2023b working paper). The spatial distribution of black sea bass commercial landings has changed over time, with the highest landings shifting from the waters off of Virginia, Delaware, and New Jersey in early years (1994-2005) to the waters off of New York, Rhode Island, and Massachusetts in recent years (2006-2021). The total commercial landings from the continental shelf south of New York and Rhode Island has also increased in recent years (2016-2021), potentially reflecting increased availability in these areas.

Commercial landings by market category varied over time. Landings prior to 2000 were primarily small and medium fish, and landings since 2010 have been primarily large and jumbo individuals. Annual length samples were combined across gears to permit length expansions by region, semester and market category. The primary differences in size composition among gears were accounted for by completing catch expansions separately for each market category. Region, year and semester-specific age-length keys were applied to expanded commercial landings-at-length to estimate commercial landings-at-age for each region (Truesdell & Curti 2023b). Landings-at-age in the northern and southern regions showed an expansion in the age structure over the time series with ages 6^{+} becoming more prevalent from approximately 2000 onward.

Commercial discards were estimated by gear type for bottom trawl, gillnet, handline, pots/traps and scallop gears. Total annual commercial dead discards in the north averaged approximately 28 mt through 2000, increased to an average of 86 mt in the 2000s, and then increased substantially during the 2010s to a maximum of 918 mt in 2017. Total annual commercial dead discards in the south generally varied without trend over the 1989-2021 time series and averaged 66 mt. Across both regions, bottom trawls were generally the greatest source of discards, though scallop gear and pots/traps were also dominant in some years. The spatial distribution of discarded catch from observed commercial trips is greatest on the outer continental shelf. In recent years (2015-2021), total observed discards have increased in nearshore waters south of Rhode Island and Massachusetts as well as offshore around Hudson Canyon.

Discard length expansions were completed for each region, semester, year and gear type. Discard length composition data were obtained from the Northeast Fisheries Science Center (NEFSC) Northeast Fisheries Observer and At Sea Monitoring programs, and the Commercial Fisheries Research Foundation (Verkamp et al. 2023). Resulting expanded discards-at-length showed an increase over the time series in the maximum length in both regions and an increase in the median discarded length in the northern region. The same age-length keys used for commercial landings were also applied to expanded commercial discards-at-length to estimate commercial discards-at-age for each region. Similar to the trends in landings, discards-at-age in both the northern and southern regions showed an expansion in the age structure over the time series with ages 6^{+} becoming more prevalent from approximately 2000 onward.

Trends in total commercial catch varied by region. In the northern region, total commercial catch averaged approximately 450 mt through 2010 but then increased to a maximum of 2,346 mt in 2017 and averaged approximately 1,850 mt since 2017. In the southern region, total commercial catch averaged approximately 940 mt through 2005, decreased during the late 2000s and has averaged 450 mt since 2010. Across regions, the majority of commercial catch is landed, but the proportion of the catch that is discarded has increased since 2010, especially in the northern region.

After extensive literature review and analysis (Beaty et al. 2023 working paper), the working group decided to assume 15% discard mortality for handlines, pots and traps and 100% discard mortality for trawl, gillnet and scallop gears.

The primary source of recreational catch data, including annual weight and catch-at-age for both harvest and discard, is NOAA's Marine Recreational Information Program (MRIP) which provides estimates back to 1981. The MRIP program estimates quantities and coefficients of variation (CVs) for harvest weight and discards in numbers via angler interviews and observations on retained fish which occur primarily at shore-side fishing locations. Recreational harvest and dead releases substantially increased in the northern region beginning in approximately 2010; prior to 2010 harvest and releases generally increased but at a modest rate (Truesdell & Curti 2023a working paper).

Recreational fishing effort for black sea bass from party/charter vessels is largely concentrated in nearshore waters from Cape Hatteras to Cape Cod in water depths less than 30 meters. Since 2005, the number of black sea bass trips in Long Island Sound and Southern New England has increased. The distribution of recreational fishing effort has also expanded in deeper waters across the continental shelf in recent years (2015-2021; Curti et al. 2023b working paper).

The size composition for total recreational catch was limited to fish larger than 10 cm and included very few fish larger than approximately 55 cm. Median size of recreational harvest increased over time in both the north and the south and the median size of recreational discards also increased though not as dramatically. Large cohorts were not evident by eye in the length compositions, but after they were converted to ages these year classes, especially 2011 and 2015 in the northern region, were evident in the age compositions (Truesdell & Curti 2023a working paper).

TOR3: Survey Data

"*Present the survey data used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, application of catchability and calibration studies, etc.) and provide a rationale for which data are used. Describe the spatial and temporal distribution of the data. Characterize the uncertainty in these sources of data*."

The working group examined numerous fishery-independent surveys as potential indices of index black sea bass relative abundance, which are described in TOR 3 Survey Data and in the Truesdell & Curti 2023c, Hansell & Curti 2023, Painten et al. 2023, Brust et al. 2023, and Jones et al. 2023 working papers. In the northern region, the surveys explored included: the NEFSC, Northeast Area Monitoring and Assessment Program (NEAMAP), Massachusetts, Rhode Island and Connecticut Long Island Sound spring and fall bottom trawl surveys, the Massachusetts and Rhode Island ventless trap surveys, and the New York Peconic Bay trawl survey (Truesdell & Curti 2023c working paper). In the southern region, the surveys explored included: the NEFSC winter, spring and fall surveys; the NEAMAP spring and fall surveys, the New Jersey bottom trawl survey, the Delaware trawl survey and the Maryland trawl survey. The working group considered incorporating each of the surveys in three ways: using the data directly as a stratified or geometric mean (depending on the survey design), standardizing the indices using generalized linear models, and compiling an aggregate index using a spatiotemporal model (i.e., VAST). After fully vetting each option, the working group decided to move forward with Vector Autoregressive Spatio-Temporal models (VAST) indices to account for time-varying catchability among surveys and the small geographic footprint (and potentially changing availability) of the state surveys in comparison to the range of the stock.

Seasonal VAST models were used to produce both aggregated and age-based distribution and abundance estimates (Hansell & Curti 2023 working paper). VAST model results suggest that black sea bass center of gravity has shifted northeast in the southern region and that their range has expanded poleward. VAST model results further suggest that relative abundance has increased in the northern region and remained stable in the southern region.

In addition to trawl survey indices, the working group also considered a ventless trap survey index (Painten et al. 2023 working paper). The ventless trap survey time series, however, was limited in length and, thus, the working group did not prioritize the inclusion of this index in model runs.

The working group also developed and considered two fishery-dependent indices of abundance: recreational catch per angler (CPA) and commercial CPUE. Black sea bass stock assessments since 2017 have included an abundance index based on recreational CPA. This index provides broad spatial and temporal coverage that is difficult to achieve with federal and state-run fishery independent surveys. After reviewing diagnostics and comparing trends to other possible indices of abundance, the working group decided to include the recreational CPA index in the stock assessment model (Brust et al. 2023 working paper).

In an effort to explore the utility of fine-scale fishery dependent data from the commercial fleet to the black sea bass stock assessment, the working group developed standardized commercial CPUE indices for bottom trawl gear (Jones et al. 2023 working paper). To do this, the working group combined data sets from two fine-scale fishery dependent collection programs: 1) the NEFSC's Study Fleet Program, and 2) the Northeast Fisheries Observer Program. The standardized CPUE indices largely followed the trends of the survey and recreational fishery indices, and provided complementary information about trends in the black sea bass stock. Though the commercial CPUE indices from this effort are not included in any model runs, they are useful as a qualitative 'sense checking' comparison.

TOR4: Stock Size and Fishing Mortality

"*Use appropriate assessment approach to estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Compare the time series of these estimates with those from the previously accepted assessment(s). Evaluate a suite of model fit diagnostics (e.g., residual patterns, sensitivity analyses, retrospective patterns), and (a) comment on likely causes of problematic issues, and*

(b), if possible and appropriate, account for those issues when providing scientific advice and evaluate the consequences of any correction(s) applied."

The working group developed two stock assessment models that are described in TOR 4: Stock Size and Fishing Mortality and in the Miller et al. 2023, Miller 2023, and Fay et al. 2023 working papers. The proposed base model uses a multi-stock, multi-region extension of the Woods Hole Assessment Model (WHAM) R package (Multi-WHAM refers to this extension of WHAM) to simultaneously model the northern and southern regions of the stock and movement of fish originating in northern region (see Stock Structure and Spatial Partitioning section for a description of the regions, Miller et al. 2023 and Miller 2023 working papers). Recreational CPA and spring VAST aggregate indices for the northern and southern regions along with corresponding age composition data were used to inform the model. Catch and associated age composition data for regional recreational and commercial fleets were also used. The model also includes effects of a winter bottom temperature covariate on recruitment in the northern region. Process errors in the latent bottom temperature covariate, recruitment, survival, and selectivity of some fleets and indices are estimated as random effects. The working group arrived at the proposed base model from analyzing more than 30 different fits of Multi-WHAM to different sets of observations. The proposed base model exhibits negligible retrospective patterns in fishing mortality or spawning stock biomass (SSB) for either region and one step ahead (OSA) residuals appear adequate for most of the data components.

WHAM outputs indicate that SSB in the northern region averaged approximately 1,300 mt through 2005, beyond which it steadily increased to a maximum of almost 16,300 mt in 2016 and has averaged approximately 13,400 mt since 2017. This consistent and sustained increase in the northern SSB was largely driven by strong 2011 and 2015 year classes. In contrast, SSB in the southern region averaged approximately 3,800 mt before increasing to a peak of 11,200 mt in 2002 as strong 1998, and especially 1999, year classes moved through the population. SSB in the south then decreased back to an average of 4,300 mt through the late 2000s and early 2010s and then steadily increased during the last eight years of the time series to approximately 7,500 mt in 2021. Stock-wide SSB across the northern and southern regions combined was estimated at 22,630 mt in 2021.

Recruitment estimates indicated that year class strength varied substantially between the two regions. In the north, the 2011 and 2015 year classes were the biggest recruitment events of the time series. In the southern region, these year classes were both above the time-series average, but were not of the magnitude observed in the north. In contrast, in the south the largest recruitment events occurred during the beginning of the time series with the 1994 and 1999 year classes. Stock-wide recruitment across the northern and southern regions combined was estimated at 35.2 million in 2021, 95% of the 1989-2021 time series average.

Fully-selected fishing mortality rates have been similar for both regions, ranging across the time series from 0.44-1.31 in the north and 0.24-1.70 in the south. Over the time series, fishing mortality in the north largely varied without trend and averaged 0.71. In the southern region, however, fishing mortality was generally higher during the beginning of the time series, averaging 1.19 through 1997, declined during the late 1990s and has averaged 0.40 since 2001. Fleet-specific fishing mortality rates indicate notable differences between regions, where the southern recreational fishing mortality exhibited the largest fishing mortality of the four fishing fleets through the late 1990s and then generally decreased during the 2000s to an average of 0.24 since 2011. In contrast, fishing mortality rates for the recreational fleet in the north have trended from the lowest of the four fleets during the 1990s, averaging 0.21, to the highest fleet-specific rates since 2009, averaging 0.49. Fully-selected total fishing mortality across all regional fleets was estimated at 1.12 in 2021.

A stock synthesis (SS) modeling approach produced similar results, suggesting that the results are robust to a range of data and model decisions (Fay et al. 2023 working paper). The SS model, however, exhibits strong retrospective patterns in both fishing mortality and SSB.

TOR5: Status Determination Criteria

"*Update or redefine status determination criteria (SDC; point estimates or proxies for B_{MSY}, $B_{THRESHOLD}$, F_{MSY} and MSY reference points) and provide estimates of those criteria and their uncertainty, along with a description of the sources of uncertainty. If analytic model-based*

estimates are unavailable, consider recommending alternative measurable proxies for reference points. Compare estimates of current stock size and fishing mortality to existing, and any redefined, SDCs."

As described in TOR 5 Status Determination Criteria, the Multi-WHAM package was used to develop biological reference points based the most recent 5-year average of age-specific maturity, SSB weight, catch weight, fleet selectivity, and natural mortality estimates to calculate $F_{40\%}$, and the average annual recruitment for years after 1999 to estimate SSB at $F_{40\%}$. The average of recruitments after 1999 for each region were used to weight the region-specific equilibrium spawning biomass per recruit (SPR) estimates to determine the stock-wide unfished SPR and the fishing mortality at 40% of this unfished value. The total estimated fully selected fishing mortality that achieved 40% of unfished SPR was $F_{40} = 1.03$ and values for the north and south were 0.71 and 0.32, respectively. The percentages of unfished SPR for the northern and southern regions were 39% and 41%, respectively. The estimated total equilibrium SSB at F_{40} was 12,491 mt, and for the northern and southern regions, estimates were 6,474 and 6,017 mt, respectively. In 2021, there is a 0.71 probability of $F>F_{40}$ and SSB >0.5 SSB(F_{40}), a 0.29 probability of $F<F_{40}$ and SSB>0.5SSB(F_{40}), and a negligible probability of SSB<0.5 SSB(F_{40}).

The objective of this research track is to develop the assessment and projection methodology that will be used in subsequent management track assessments. As such, stock status recommendations are not part of the research track Terms of Reference and the results from this research track assessment will not be used directly in management. Instead, this research track assessment will inform a management track assessment scheduled for June 2024. The 2024 management track assessment will provide updated estimates of stock status using data through 2023 and will be used to inform management measures for 2025-2026.

TOR6: Projection Methods

"*Define appropriate methods for producing projections; provide justification for assumptions of fishery selectivity, weights at age, maturity, and recruitment; and comment on the reliability of*

resulting projections considering the effects of uncertainty and sensitivity to projection assumptions."

The objective of this research track TOR is to develop the projection methodology that will be used in subsequent management track assessments. The working group used WHAM to configure short-term (2022-2024) projections, as described in TOR6 Projection Methods. Following the methods used to estimate reference points under prevailing conditions (TOR5), region-specific average annual recruitment estimates for years after 1999 and the most recent 5-year average of age-specific maturity, SSB weight (by region), catch weight (by fleet), fleet selectivity (by fleet), and natural mortality estimates (by region) were used to conduct short-term projections. Models for random effects on the bottom temperature covariate, recruitment, and survival were used to predict bottom temperature and abundance-at-age in the projection years. Given that this is a research track stock assessment with a focus on methodology, these projection results will not be used directly in management. A management track assessment scheduled for June 2024 will provide updated projections using data through 2023 and will be used to inform management measures for 2025-2026.

TOR7: Research Recommendations

"*Review, evaluate, and report on the status of research recommendations from the last assessment peer review, including recommendations provided by the prior assessment working group, peer review panel, and SSC. Identify new recommendations for future research, data collection, and assessment methodology. If any ecosystem influences from TOR 2 could not be considered quantitatively under that or other TORs, describe next steps for development, testing, and review of quantitative relationships and how they could best inform assessments. Prioritize research recommendations*."

This working group reviewed and prioritized previous and new research recommendations, as described in TOR7 Research Recommendations. High priority research topics include 1)

Movement rates and cues, including research to quantify movement between the northern and southern regions and research on environmental drivers of this movement, 2) Role of varying recruitment and strong year classes in stock dynamics, including drivers of recruitment, 3) Development of reliable indices of abundance beyond existing surveys, 4) Enhanced port sampling or similar programs to bolster the data that support estimation of fishery length and age compositions, and 5) Metrics for measuring recruitment as a response variable to environmental indicators. Medium priority research topics include 1) Environmental drivers of recruitment, 2) Expanded fishery-independent abundance indices, 3) Use of industry study fleet data, 4) Discard mortality rates, particularly for gear types for which there has been limited or no new recent research, 5) Methods for filling bottom temperature data gaps for use as an environmental indicator, including consideration of new data sources and analytical products, 6) Development of a commercial CPUE index, 7) Socioeconomic drivers of recreational and commercial fishing for black sea bass and associated species, 8) Impacts of expansion into the northern range of the stock on fishing behavior, 9) Food web interactions and impacts on stock productivity and 10) Incorporation of a fall VAST index, and 11) Scaling recreational catch CVs. Other research priorities include 1) Further evaluation of the two region structure of the model, 2) Spatial patterns in growth, recruitment, and mortality, 3) Quantification of range expansion, 4) Habitat use and seasonal changes, 5) Sex change, sex ratios, and spawning dynamics, 6) Natural mortality, 7) Precision and uncertainty in discard estimates, and 8) Exploring separate age-length keys by semester, region, and fishery/survey after 2008 when more data are available.

TOR8: Backup Assessment Approach

"*Develop a backup assessment approach to providing scientific advice to managers if the proposed assessment approach does not pass peer review or the approved approach is rejected in a future management track assessment*."

As described in TOR8 Backup Assessment Approach, the working group recommended that if the proposed Multi-WHAM assessment approach does not meet peer review standards, a simpler

WHAM configuration that emulates ASAP (i.e. model with only fixed effects) is used as the backup approach. This fixed-effects ASAP-like WHAM model would still integrate biological, catch, age composition and index information, and therefore, is considered a more informative contingency plan than a purely empirical approach. Following standard practice, a retrospective adjustment would be applied to the terminal year estimates if the rho-adjusted values fall outside of the 90% confidence intervals of the original values.

Summary Report of the Black Sea Bass Research Track Stock Assessment Peer Review

December 5 - 7, 2023
Northeast Fisheries Science Center, Woods Hole, Massachusetts

Report prepared by Panel Members:
Olaf Jensen (Chair), MAFMC SSC
Jean-Jacques Maguire, independent contractor with CIE
Sven Kupschus, independent contractor with CIE
Joel Rice, independent contractor with CIE

Introduction

The Northeast Region Coordinating Council (NRCC)[1] has developed an enhanced stock assessment process to improve the quality of assessments. The process involves two tracks of assessment work: 1) a management track that includes routine updates of previously approved assessment methods to support regular management actions (e.g., annual catch limits), and 2) a research track that allows comprehensive research and development of improved assessments on a stock-by-stock or topical basis. The research track assessment process allows for a more thorough review of information available and for the evaluation of different assessment approaches than would be possible in a standard stock assessment process where the results are immediately used for management advice. This Panel reviewed the Research Track Assessment for the northern stock of black sea bass.

The previous stock assessment for the northern stock of black sea bass (BSB) (https://www.google.com/url?q=https://repository.library.noaa.gov/view/noaa/39406&sa=D&source=docs&ust=1702049662893310&usg=AOvVaw3_x9gT-g1DXYlR1OSKQ1Au) was based on a two independent region-specific Age-Structured Assessment Program (ASAP) models with the division between the northern and southern *stock components* occurring roughly at Hudson Canyon. A separate southern *stock* of black sea bass south of Cape Hatteras, NC is assessed and managed separately and was not the focus of this Research Track assessment. The Black Sea Bass Research Track Working Group (WG) opted to maintain the two-region approach with the same regions but developed new fishery-dependent and fishery-independent indices of relative abundance, tested environmental covariates of recruitment, and explored two modeling frameworks: a multi-region extension of the Woods Hole Assessment Model ("multi-WHAM") and Stock Synthesis (SS).

[1] Atlantic States Marine Fisheries Commission (ASFMC), Greater Atlantic Regional Fisheries Office (GARFO), Mid-Atlantic Fishery Management Council (MAFMC), New England Fishery Management Council (NEFMC), and Northeast Fisheries Science Center (NEFSC).

The work of the WG has been reviewed by the Black Sea Bass Research Track Peer Review Panel that met via Webex from December 5-7, 2023. The Panel included three independent scientists selected by the Center for Independent Experts (CIE): Jean-Jacques Maguire (independent contractor and member of the Scientific and Statistical Committee of the New England Fisheries Management Council), Sven Kupschus (European Commission Joint Research Center, Italy) and Joel Rice (Joel Rice Consulting, USA). The Panel was chaired by Olaf Jensen (University of Wisconsin - Madison and member of the Scientific and Statistical Committee of the Mid-Atlantic Fisheries Management Council).

The Working Group Assessment Report and 18 supporting Working Papers were made available to the panel on the data portal (https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php) on November 14, 2023. The Panel was also given access to the GitHub repositories used by the WG where they could access model code, data input files, and model outputs including figures and tables. Individual Panel Members and the Chair took the lead in providing first drafts of various sections of the report, but the entire Panel is responsible for the whole report. Prior to the meeting, members of the Panel met with Michele Traver (NEFSC's Stock Assessment Workshop Process Lead), Larry Alade (Chief, NEFSC Population Dynamics Branch) and Alexander Dunn (Communications Specialist, NEFSC Population Dynamics Branch) to review and discuss the meeting agenda, reporting requirements, meeting logistics and the overall process.

Presentations made by WG members during the review panel are listed in the agenda (Appendix 2) and available as PDFs on the data portal. Other WG members were present and answered questions from the review panel and contributed to the discussions on various topics. Jessica Blaylock, Toni Chute, Giovanni Gianesin, Brian Linton, and Emily Liljestrand acted as rapporteurs throughout the meeting (see Appendix 4 for materials provided and Appendix 5 for meeting attendees). The WG was chaired by Anna Mercer (NEFSC) and included staff from NOAA Fisheries, academia, a non-governmental organization, and state fishery management agencies. Terms of Reference for the WG are provided in Appendix 1.

Panel members and the Chair drafted this Summary Report in a Google Doc. The Panel Chair compiled and edited this Summary Report with assistance (by correspondence) from the CIE Panelists, before submission of a draft report to the WG. The scope of the WG review of the draft was limited to suggesting corrections for errors of fact or requesting that Panel recommendations be clarified. Additionally, each of the CIE Panelists will submit their separate reviewer's reports to the CIE.

The Panel agreed that all nine TORs had been met: TORs 1-3 and 5-9 ***fully met*** and TOR 4 ***partially met***. The Panel agrees that the new assessment framework proposed by the WG (multi-WHAM) is a significant advance from the previous ASAP models and is an acceptable basis for providing management advice, including estimating biological reference points (BRPs) and making projections. However, the Panel recommends conducting additional sensitivity runs (described under TOR 4 and 7) before deciding on a final model configuration for use in the management track assessment.

The Panel's evaluation of the WG's response to the nine TORs is provided below and key recommendations are summarized under TOR 7.

Evaluation of the Terms of Reference for Black Sea Bass

1. Identify relevant ecosystem and climate influences on the stock. Characterize the uncertainty in the relevant sources of data and their link to stock dynamics. Consider findings, as appropriate, in addressing other TORs. Report how the findings were considered under impacted TORs.

The Panel agreed that this TOR has been **fully met**.

Considerable work was accomplished by the WG under this TOR and important advancements have been made not only in describing ecosystem change, but also in incorporating quantitative links between ecosystem change and stock dynamics in the assessment model. Two specific accomplishments under this TOR stand out: (1) development of a bottom temperature index and including it in the assessment model to help predict recruitment to the northern region, and (2) developing a time series of annually varying biological reference points that model changes in stock productivity without having to specify the mechanistic basis for these changes. This second accomplishment was not explicitly framed by the WG as belonging to TOR 1, but it substantially advances the underlying goal of incorporating ecosystem change into the stock assessment.

Work under this TOR began with a hypothesis driven exploration of relationships between the marine environment and different aspects of BSB life history. The WG then narrowed in on the relationship between bottom temperature and winter distribution of BSB across the continental shelf. A bottom temperature index was created from a new temperature reanalysis product (du Pontavice et al. 2023) based on an oceanographic model of bottom temperature across the Northeast US shelf. This index was initially tested as a predictor of recruitment through comparison of the recruitment deviations from the 2021 ASAP models for BSB. The strong correlation among these variables led the WG to include bottom temperature as a linear predictor of recruitment in the base multi-WHAM assessment model. The WG conducted a sensitivity run of the multi-WHAM model without this temperature-recruitment relationship and estimated a similar recruitment time series. However, the temperature-recruitment relationship is influential in projecting recruitment and provides a potential link for future incorporation of bottom temperature projections from oceanographic forecasting models.

The WG conducted additional analyses in an attempt to develop environmental indices that could be used as a predictor of mixing between the two regions. Black sea bass have undergone a pronounced northeastward expansion of their spatial distribution over the past 40 years (Bell et al. 2015). The WG considered the possibility that mixing rates may be higher when the centers of gravity in the northern and southern region are closer. A second hypothesis related to winter shelf water volume (SWV) and the seasonal offshore migration of BSB. Based on observations from Miller et al. (2016), the WG considered the possibility that in winters with higher SWV, BSB must travel farther offshore to escape this colder water and the potential offshore winter mixing between

the northern and southern stock components is greater. The WG's analyses did not support using either of these relationships in the stock assessment.

The multi-WHAM model itself also allows for incorporation of environmental change into predictions of stock dynamics without explicitly specifying the underlying mechanistic basis. The WG's proposed model includes random effects on recruitment and survival, selectivity, and on the indices of relative abundance. Random effects on recruitment, specified as an autoregressive process, allow for estimation of recruitment trends (and interannual variation) without specifying the environmental driver(s) of recruitment. Similarly, the WG's use of dynamic biological reference point calculation provides a mechanism by which stock status determination and management advice can reflect apparent stock productivity changes (in this case, apparent increases in productivity) without the need to develop explicit environmental covariates of productivity. Black sea bass appear to be among the climate change "winners" (i.e., species whose productivity has increased with warming, Free et al. 2019) and the new assessment framework developed by the WG provides a mechanism to incorporate such change into management advice. Dynamic reference points will, however, present some additional challenges in communicating management advice as they represent an additional source of uncertainty in projections.

In addition to the ecosystem indicator work described above, the WG conducted several additional analyses under this TOR, including: (1) an update of age-length keys used to account for changes in somatic growth, (2) key informant interviews (n=16) with commercial and recreational fishing industry stakeholders, and (3) a comprehensive evaluation of approaches to estimating natural mortality (M) external to the assessment model.

The stakeholder interviews were useful for identifying factors that may have caused changes in catch per unit of effort (CPUE) or selectivity. These interviews generally corroborated estimated changes in selectivity from the assessment model and some of the ecological and ecosystem processes considered in the WHAM model. For example, the age of fully selected fish estimated by the model increased through time for the recreational fleet in the northern region, which is consistent with increasing minimum length limits discussed by recreational anglers.

A new tool for estimating M from life history, taxonomic, and environmental factors (Cope and Hamel (2022) was applied to data for BSB. The value of M used in previous assessments (0.4) was near the center of the distribution of plausible values generated by the Cope and Hamel (2022) tool and the WG concluded that there was insufficient information to justify a change in M from 0.4. The panel noted that not all of the approaches used in the Cope and Hamel tool are equally accurate and future work on this topic should consider alternative weighting methods for arriving at a point estimate of M. For example, Then et al. (2014) reviewed many of these approaches and found that the cross-validation error of methods based on maximum age was approximately half that of methods based on growth model parameters. The panel also recommended additional sensitivity runs of the multi-WHAM model with alternative plausible values of M given that M is relatively poorly estimated and is often an influential fixed value in stock assessment models. This recommendation is discussed in more detail under TOR 4.

2. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.

The Panel agreed that this TOR has been **fully met**.

The WG comprehensively addressed the TOR in its work. The panel particularly endorses the efforts to maintain the maximum contrast in cohort signal whenever possible and the approach of automation of procedures for effective and consistent application during the management track process. The panel notes that the WG's efforts appeared focused towards the application by the Multi-WHAM assessment model and that for other model applications other options may have been possible with different risks and benefits. The WG conducted an extensive analysis of the available commercial catch information for the BSB stock. Limited reliable age composition data were available before 1989. Data from 1989 onwards demonstrated contrast between the northern and southern stock components as well as the ability to identify large and small cohorts (particularly the large 2011 and 2015 cohorts in the northern region) consistently as already suggested by the previous assessment process using ASAP. For this reason the WG focused its effort on maintaining these aspects of the data in order to support a more modern stock assessment method aimed at dealing with some of the shortcomings (e.g., strong retrospective patterns) of the previous ASAP models. The panel agrees with the focus on maintaining the cohort structure in the ALK for use in Multi-WHAM.

Age-Length-Keys

The WG developed a single two-area, bi-seasonal, conditional age length key from all data sources. While ideally one would retain fleet specific age information, paired age / length samples were sparse at the beginning of the time series and numbers for gear, area and season year combinations were too low to provide reasonable age compositions. The WG prioritized cohort consistency by developing an all fleets ALK and aggregating fish > 35cm across seasons as seasonal growth differences were small by this size. This leaves the length structure to account for differences in fleet selectivities.

The panel felt this was an appropriate treatment of the data and agreed with the WG that the risk of fleets targeting specific ages within a mixed length distribution in a population with good overlap between age distributions is very small.

Where less than ca 250 age-length pairs were available borrowing of sample information from 'proximal' samples was implemented in the order of region, semester, and region and semester to preserve cohort and spatial structure in the assessment input information.

Length samples from the commercial sector

The WG hoped to maintain fleet specific age compositions in order to be able to model the selectivities independently. However, historically this was not possible due to a lack of available

length samples. The commercial catch is sampled by market category and the lack of consistent coverage of categories made raising of those catches problematic. In recent data with comprehensive temporal coverage for all fleets, it was found that the length distributions between market categories varied considerably more than the variation among gears within the market categories. Category therefore served as a more reasonable proxy of selectivity. Therefore, samples and landings were combined across gears for raising, resulting in a single commercial fleet.

The panel supported this decision to combine across gears as it focuses on retaining the contrast in cohort structure, while having a minimal effect on the model accuracy. First the available evidence provided does not indicate substantial spatial separation in distribution of ages past the recruitment age and up to age 3 (the last modeled age of selectivity). The panel concluded there should be sufficient information in the length composition data for the model to be able to cope with the assumption of a single commercial fleet.

Commercial landings

Landings data were treated as census data, but unfortunately the location information has a different resolution than the region division at the Hudson Canyon. Statistical units spanning the Canyon were therefore assigned to either the south or the north region.

Commercial discards

Commercial discards were assigned 100% mortality for trawl and gillnet fleets and 15% mortality for pots/traps and handlines. Both the occurrence (due to regulation and economics) and the data availability of discards has increased in the time series.

Sampling data from observer programs also increased in recent years. The same alk aggregation procedure / prioritization was followed as for the retained portion of the catch but often greater levels of aggregation / borrowing was required to reach the minimum sample thresholds. meaning aggregation was necessary over greater numbers of domains for a larger number of area season year combinations.

The panel felt reassured by the consistency of the cohort structure of the data raised in this way suggesting the aggregation had little impact on modeled population dynamics, but a common ALK was used which may then provide a false sense of reliability. Nevertheless, the panel felt raising of the discard biomass to the length structure was a sensible method of raising the data.

Recreational retained catch

Recreational length compositions and their uncertainty for retained fish were taken predominantly from the MRIP intercept survey with some minor supplementation from other sources. Largely following the design-based estimates associated with the sampling design for the retained component. The panel noted that, in the northern region of the stock in particular, a large portion of the fishing mortality originates from the recreational fishery.

Recreational dead discards

Because recreational monitoring activities are largely shore-based, information on the discarded component is available only as total numbers released and not in weight nor at-length. The WG concluded that the best estimate for the discard length composition was the observer data. These data are available only since 2004 and only from the headboat (party) sector. Although this represents a relatively small proportion of the total releases the WG made the assumption that the for-hire (head boat samples collected at sea) were representative of all recreational releases. There are differences between the head boat sector and other recreational sectors, but the WG felt that there were no compelling reasons to suspect differences among recreational sectors in discard length composition. Recreational data are only available at the resolution of the state so the Hudson Canyon boundary was implemented only approximately with states assigned to either the north or south subregion despite recognition that anglers (particularly in NY and NJ) sometimes fish in one region but land in the other.

Recreational release estimates are provided as individuals at length, whereas the input to the WHAM model currently requires aggregate removals in weight and compositional data (proportion of numbers-at-age). Therefore, an all length-weight data combined length weight relationship was used for the conversion.

3. Present the survey data used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, application of catchability and calibration studies, etc.) and provide a rationale for which data are used. Describe the spatial and temporal distribution of the data. Characterize the uncertainty in these sources of data.

The Panel agreed that this TOR has been **fully met**.

The WG addressed all aspects of the TOR. The panel notes that the majority of documentation and presentations focused on the evaluation of the WG proposed assessment methodology (Multi-WHAM) and that evaluation of other methods (e.g. ASAP, SS3) was limited and largely restricted to TOR 4 through the assessment diagnostics.

Data from 10 fishery-independent surveys covering the stock area were available covering spring-fall and north-south components of the stock although it is noted that the distribution of the surveys in these strata is not even. Not all surveys provided associated age information and where lacking these were imputed from length distributions using the general ALK. A number of covariates were included in standardization models both GLMs (individual surveys) and VAST (single index). The WG decided early on to stay with the resolution of the previous ASAP process so surveys were grouped to provide spring and fall indices in the south and in the north. The VAST models used the data combined over regions to estimate abundance, but the results were subsequently split between north and south for assessment purposes.

Most of the presentation and discussions focused on the development of the VAST model as the WG decided that this was their preferred method for incorporating all of the surveys into the WHAM model. In addition, it was discovered just prior to the review that the fall VAST index had been incorrectly adjusted for the presence of 0-age fish so that this was not reviewed.

VAST is now widely used in the US and elsewhere to standardize indices across multiple surveys and as such has been extensively reviewed in general so the approach was accepted by the review panel as an appropriate method to reduce conflicts among indices in the assessment model. However, relatively little information in terms of model diagnostics was presented at the panel review and the index is used as an age-based index and the age-specific spatial results were provided during the review which made an independent evaluation difficult. Most of the evaluation is based on the consistency runs where the different index formulations were compared in the ASAP and multi-WHAM models (TOR 4), after which further model runs focused on the VAST index.

Although the general application of VAST is at least statistically sound there are some concerns in its direct application here. These are:

1) The inclusion of environmental covariates in the model is not entirely clear. While a lot of emphasis was placed on the center of gravity of the population for which inclusion of temperature may be appropriate, the purpose of the index is to inform the model regarding abundance. Here temperature should only be used to account for variation in conditions sampled (due to random sampling) not in the systematic change in the conditions as we might expect from climate change. Having accounted for temperature differences in the index it then seems inconsistent to look for these changes in the assessment model. While the index is based on predictions rather than the year effect in the model which uses temperature as a covariate, the results are dependent on the suitability of the temperature fit and the models ability to predict the temperature at the node points.

2) The treatment of the different surveys appears from the results to act mainly through a single scalar as opposed to age specific ones, although the panel was told this is implemented in the VAST application. Therefore, potential differences in selectivity between the different surveys may be underestimated and with the strong weighting by area the large offshore surveys would then present biased indices of the age structure. For the spring survey this is less of an issue as most individuals are found offshore, but the index from the fall survey, which occurs while BSB are migrating offshore, will likely suffer significantly from this issue. However, this could not be tested since although planned, an error was discovered so the correct data was not available to the panel. When a disproportionate part of the population is located in one or more areas, surface area alone is an inappropriate weighting metric so should not be applied without considering per area densities.

3) Density distributions by age for the two VAST indices do not show clear interannual shifts in the spatial distribution plots by age (provided to the panel during the m and surprisingly little segregation between ages, but do track cohorts reasonably well in scale across the different years, particularly in the spring survey. This suggests either the proposed large environmental impacts of temperature and shelf water volume which were implied by the WG from the raw data were overemphasized, the VAST implementation was

unintentionally able to assign this variance to covariates other than the spatial realm or VAST was too constrained to be able to follow the differences in distribution between years. Addressing this last possibility presumably would require an interaction term between the year and spatial effects.

A more in depth analysis of the VAST model developed, particularly with regards to the impact of the various data sources and covariate effects would have helped the panel better understand the suitability of the application for the intended purpose. Few diagnostics were included of the VAST models themselves and evaluation was mainly restricted to a comparison of the stock dynamics (SSB, F and recruitment) derived from the WHAM model in comparison with the ASAP model previously used.

Recreational Catch per Angler (CPA)

The WG revised the methodology for a previously available Recreational CPA index (used since 2016 in the assessment process), to reduce potential for hyperstability. Much of the focus was therefore on the identification of trips that could plausibly have caught BSB. The Jaccard method previously employed was evaluated against a number of different methods aiming to increase robustness with regards to ecosystem processes such as prevalence of other species and the northern range expansion of BSB. The corrected indices provided very similar results in terms of the standardized guild composition but the log-odds ratio method was eventually preferred due to the greater resolution on the appropriate cut-off values for targeted versus not targeted trips and visual inspection of the diagnostics.

The catch (retained plus all discarded individuals) from the recreational monitoring programs was used to assign catches to the identified effort and these were modeled by a GLM with effects of Year + State + Wave (season) + Mode (shore, private boat and party boat) + Area (N-S nested within state). The WG noted that confidence intervals (CIs, 95th percentile) were estimated via bootstrapping using 500 iterations for each region. The resulting CI of the index was extremely tight, i.e. close to the mean, presumably due to the large sample numbers. The multi-WHAM model adjusted for this perceived underestimation of the recreational CPA coefficient of variation (CV) by estimating a scaling factor for this CV.

The panel considered the change in effort estimation positive and justified, but had the usual concerns of recreational CPUE indices in general being susceptible to hyperstability. The concerns were somewhat alleviated by the consistency of patterns in the rec CPA index with other indices. As in other data sources the contrast in the data in the northern area is large and may mask finer scale hyperstability issues as abundance in the area reaches a plateau. The panel recommends that the management track process continue to examine the Recreational CPA index when updated annually for signs of hyperstability which can arise from a wide variety of factors, many of which cannot be simply addressed through better processing/estimation of the index.

Commercial CPUE index:

The WG commendably explored the development of a commercial CPUE index for the research track review. While the index is not extensively included in the assessment model exploration it does represent an approach to balance the weighting in the assessment between the recreational

and commercial fisheries, potentially helping to improve the information on the differences in the selectivities either through shared selectivities with the fleets or through development into an age based index.

The estimation of effort follows a similar procedure to the recreational index although it is noted that the uncorrected Jaccard index is still used here. Commercial CPUE is derived by haul from the NMFS Northeast Fisheries Observer Program (NEFOP) and the Study Fleet Program. A number of covariates relating to haul are provided by these sampling programs and other environmental and socio economic parameters are added post-hoc through the available covariates for the purpose of standardization.

The standardization method applied is a generalized additive model (GAM) using a Tweedy distribution applying splines, with location modeled in two dimensions (*s(Latitude,Longitude)*). While the variables used seem relevant to the standardization, there is considerable collinearity in these variables which may reduce the effectiveness of the standardization to remove bias and in fact can introduce biases. The splines are poorly informed at the terminal ends of the range (for example depth) which means they are rather susceptible (less certain) as they essentially represent extrapolations. Future data may therefore considerably alter the effects and may readjust the index over time in subsequent assessment updates.

The panel felt the efforts made in developing the index were highly informative and strongly support further development for future assessments. While the WG determined that the resulting index is currently not suitable for inclusion in the assessment process, it can provide qualitative information for the development and treatment of the catch data in the assessment as well as introduce a greater understanding of the drivers of the commercial fishery to evaluate the suitability of the final assessment approach. Particularly the fine spatial scale of the fishery catches is a valuable asset which could have been more advantageously used in the assessment development.

4. Use appropriate assessment approach to estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Compare the time series of these estimates with those from the previously accepted assessment(s). Evaluate a suite of model fit diagnostics (e.g., residual patterns, sensitivity analyses, retrospective patterns), and (a) comment on likely causes of problematic issues, and (b), if possible and appropriate, account for those issues when providing scientific advice and evaluate the consequences of any correction(s) applied.

The Panel concluded that ToR 4 had been **partially** met.

The resulting assessment is accepted for use in subsequent management track processes subject to the recommendations under ToR 7 (below) being addressed.

The WG had established a rationale for input and parameter selection that was clearly described, researched and documented. What was not shown was how sensitive or fragile the model was to the selection of the inputs (CPUE and parameter values). The WG analyzed state and federal survey data, recreational catch per angler (Rec CPA), and compiled an aggregated VAST index of abundance. Based on this analysis the WG selected what were perceived to be the indices of abundance that most likely represented the true stock dynamics (VAST and Rec CPA). The WG did not sufficiently explore how sensitive the final Multi-WHAM model is to the inclusion of either of the indices (i.e. a 'leave one out' run). Similarly, the choice of the value for natural mortality was consistent with previous assessments and logical based on the analysis presented, but the impact of this parameterization on the stock status and trend was not explored for the WG's preferred multi-WHAM model as it was for the SS3 model.

At a minimum a limited exploration of the structural uncertainty with respect to the WG selected inputs (indices of abundance) and parameterization should be explored and presented so that the resulting effect on status determination could be evaluated. For example, Punt et al. (2021) noted that natural mortality rates are often considered to be among the most important parameters in a stock assessment, but they are also among the most difficult parameters to estimate using commonly available data. As reported in Table 1 run 13 of the Miller et al. (2023) WG paper, the multi-WHAM run that attempted to estimate natural mortality did not converge. The panel notes that it was difficult to discern how robust or sensitive the model was to this parameterization of M.

The **Panel recommends** that the WG conducts sensitivity analyses including: (1) an exploration of alternative parameterizations for natural mortality (e.g. different age-independent constant values, or age-dependent M), (2) profiles of the initial fishing mortality (i.e. initial depletion) and, (3) an evaluation of which individual surveys should be included in the VAST index by comparing WHAM estimates (e.g., biomass time series) from the proposed run with individual fishery independent surveys. Surveys that do not appear to accurately reflect changes in stock size through this analysis should not be included in the VAST index.

The multi-WHAM framework and application of multi-WHAM for assessment of the BSB stock was presented through the relevant section in the main report under Tor 4, as well as multiple working papers (Miller 2023, Miller et al. 2023) along with a helpful and comprehensive presentation to the Panel meeting. The Panel appreciated the extensive description of research that had gone into the assessment formulation and testing.

Model fit diagnostics that were presented included a jitter analysis, one step ahead (OSA) residuals retrospective patterns analysis, self tests and mean absolute scaled error (MASE) as described in Kell et al. (2021). The diagnostics indicated that the proposed base run is likely appropriate for developing a status determination, pending the outcome of the recommended additional sensitivity runs. Note that in this research track assessment a status determination is not requested/required.

The choice of a temporal change in selectivity from several fully selected ages to primarily the oldest ages for the northern recreational fleet corresponds well with the regulatory changes that repeatedly increased size limit over time. The survey data were aggregated via VAST indices and the working group stated that this accounts for changes in catchability in those fleets over time and should be used in the base model. Panel members inquired as to whether individual state and federal trawl survey indices may better track individual portions of the population, and the working group stated that due to the interactions of the limited geographic footprint of many of the surveys with the black sea bass seasonal migration patterns the VAST estimates were perceived to be a better choice. A comparison of the last run to use the individual state and federal trawl survey indices (bridging run 7) and a model run with the aggregate VAST survey and other model improvements (run 34) shows broadly similar trajectories and scale but some divergent trends for the north after 2014 (Figure 1).

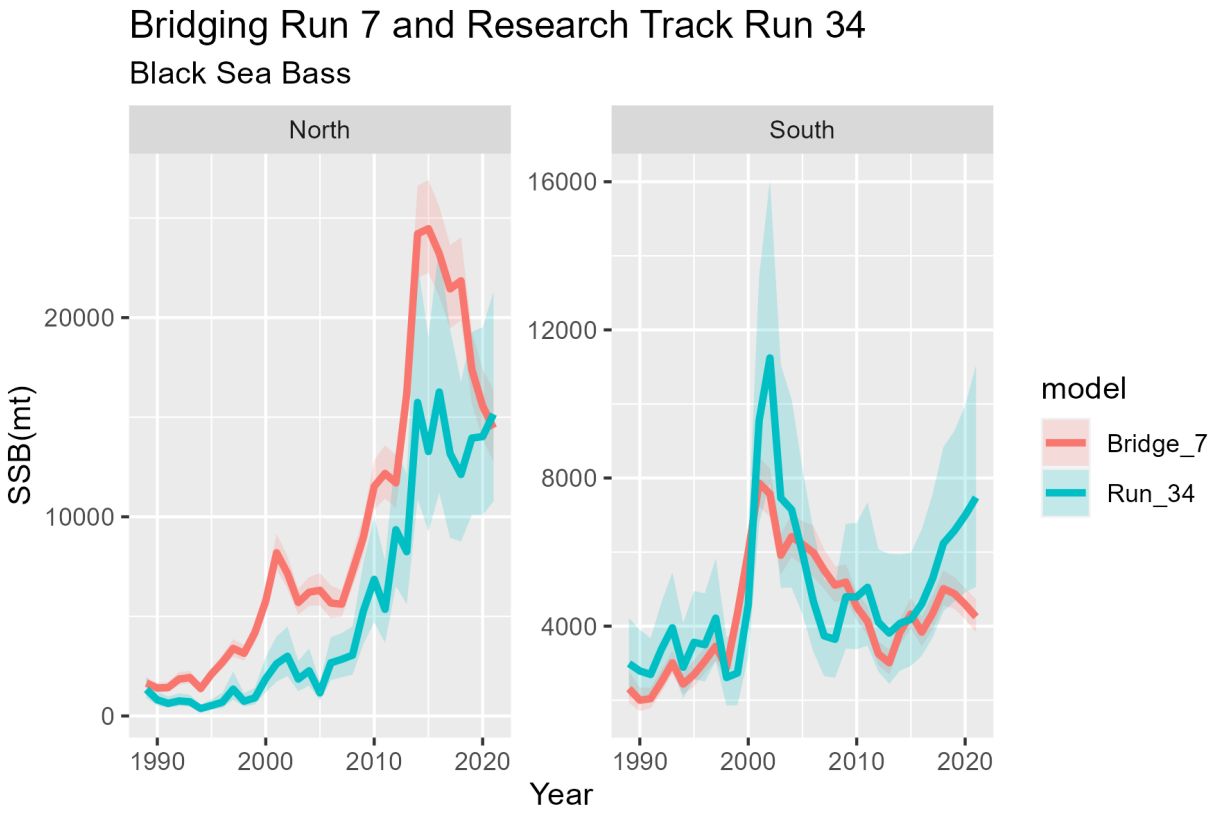

Figure 1. A comparison of using individual survey indices in the Bridge Run 7 (Bridge_7) and the proposed base case from the research track (Run_34). Shaded areas indicate a 95% confidence interval. Note that Bridge Run 7 did not estimate a scalar on the CV of the Rec CPA.

The Panel agrees that the new assessment framework proposed by the WG (multi-WHAM) is a significant advance from the previous ASAP model and is an acceptable basis for providing management advice, including estimating biological reference points (BRPs) and making projections. However, the Panel recommends conducting the additional sensitivity runs described above before deciding on a final model configuration for use in the management track assessment.

5. Update or redefine status determination criteria (SDC; point estimates or proxies for BMSY, $B_{THRESHOLD}$, FMSY and MSY reference points) and provide estimates of those criteria and their uncertainty, along with a description of the sources of uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for reference points. Compare estimates of current stock size and fishing mortality to existing, and any redefined, SDCs.

The Panel agreed that this ToR was **fully met**.

The previous biological reference points for black sea bass are from the 2021 Management Track Assessment. The previous BSB assessment reference points were calculated using the non-parametric yield and SSB per recruit long-term projection approach (NEFSC 2021). That assessment concluded that the black sea bass stock was not overfished and overfishing was not occurring in 2019 relative to the updated biological reference points. The reference points are $F_{40\%}$ as the proxy for F_{MSY}, and the corresponding $SSB_{40\%}$ as the proxy for the SSB_{MSY} biomass target.

The approach used by the WG for the Multi-WHAM base model reference points was based on the most recent 5-year average of age-specific maturity, catch weight, fleet selectivity, and natural mortality estimates to calculate $F_{40\%}$, along with the average annual recruitment for years after 1999 to estimate SSB at $F_{40\%}$ (Miller et al. 2023). Based on this approach, the stock-wide F40% is based on a stock-wide unfished SPR that represents a weighted average of the region-specific unfished SPR estimates. The WG report notes that multi-WHAM considers productivity to vary over time and provides "annual estimates of SPR-based reference points that use the annual inputs to the per-recruit calculations for F at a specified percentage of unfished spawning biomass per recruit. Annual estimates of $F_{40\%}$ and SSB at $F_{40\%}$ are provided as well as the status of annual F and SSB estimates relative to these reference points." This differs from the previous assessment in that the approach used with Multi-WHAM the stock-wide F40% is based on a stock-wide unfished SPR that represents a weighted average of the region-specific unfished SPR estimates as opposed to the previous assessments where a stock-wide F40% was based on the average of the region-specific F40% estimates.

The WG report notes that "Total SSB across regions has been above the annual SSB (F40%) reference points since 2014, and the combined fully selected fishing mortality has been near (either slightly above or slightly below) the annual F40% reference point since 2011" (Miller et

al. 2023). Consistent with the past assessment (2021, Figure 2) the current model shows a general increasing trend in SSB/SSB$F_{40\%}$, along with a general decrease in F/$F_{40\%}$ over the temporal domain of the model (Figures 3 and 4). In contrast to the previous ASAP model, the proposed (2023) base case shows a fluctuating but relatively stable population since 2014, in contrast to the 2021 (previous) assessment which showed the population experiencing a steep decline in SSB in the years following 2014.

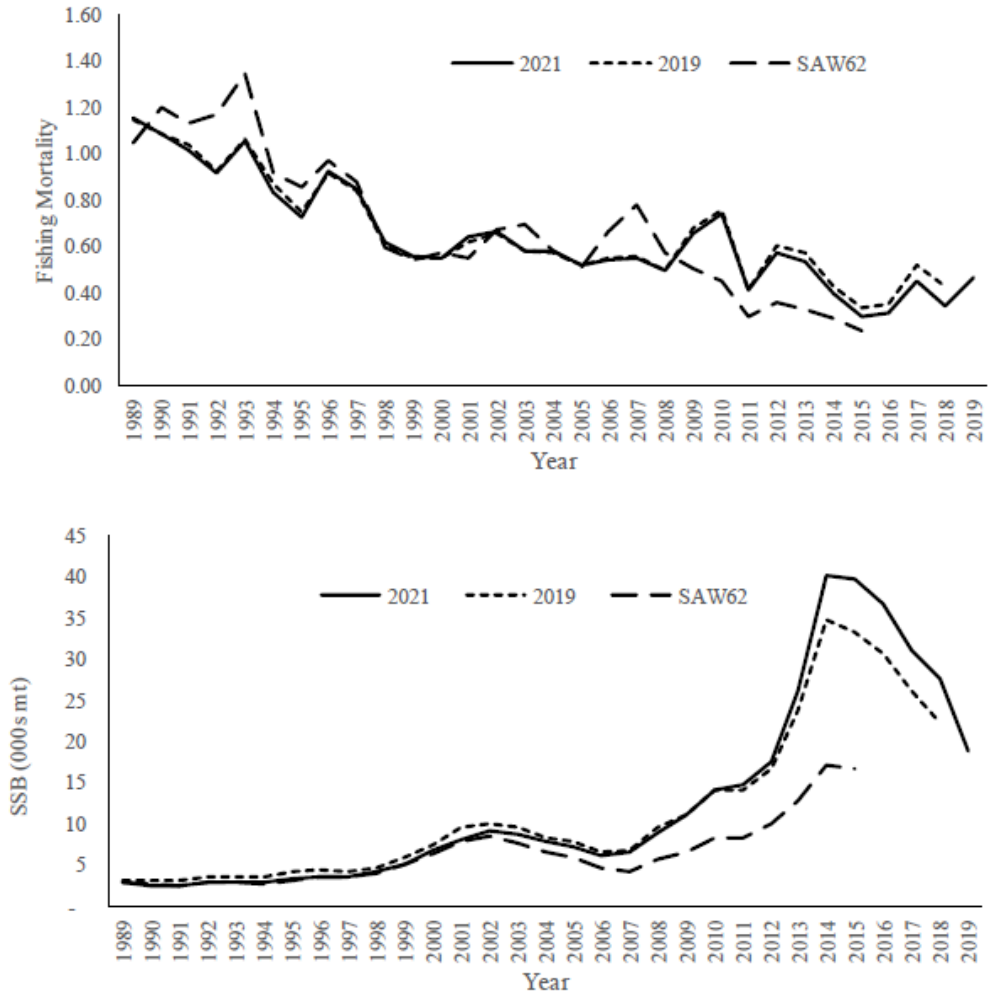

Figure A5. Historical retrospective of the 2016 (SAW 62; NEFSC 2017), 2019 and 2021 (Operational Assessment) stock assessments of black sea bass. The heavy solid lines are the 2021 Operational Assessment estimates. SAW62 did not include revised MRIP estimates.

Figure 2. Figure A5 from the 2021 Operational Assessment of BSB.

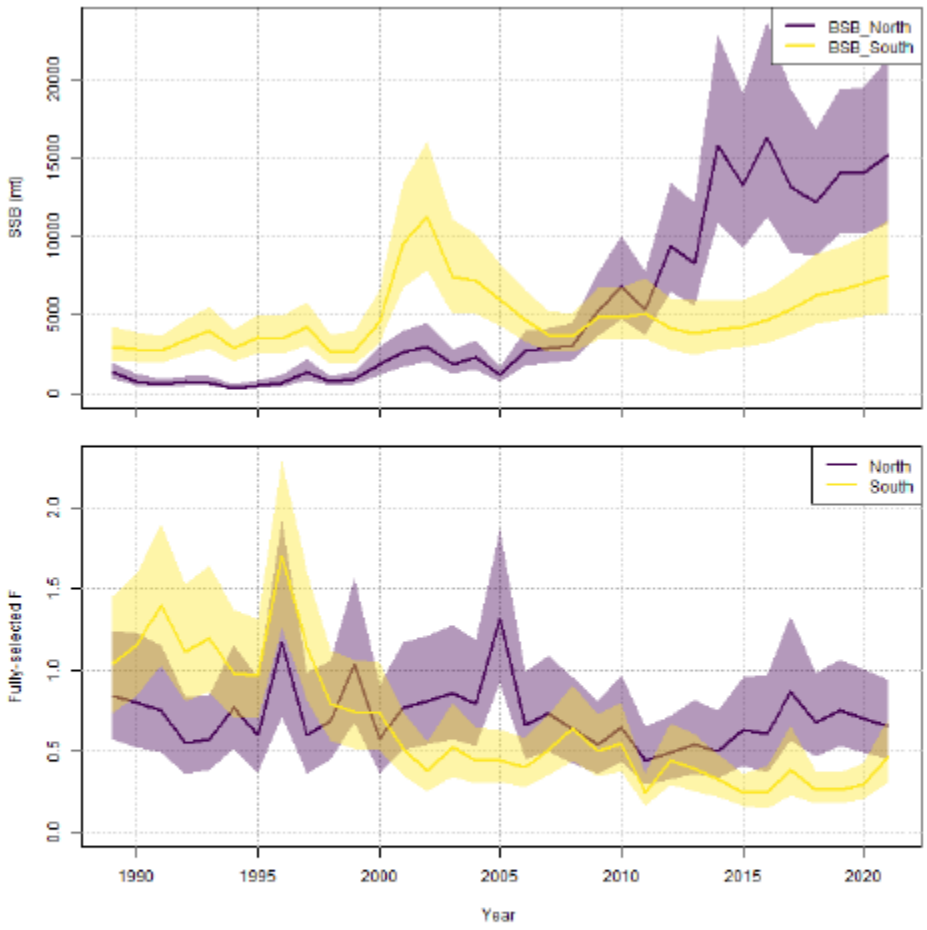

Figure 4.2: Estimated spawning stock biomass (top) and fully-selected fishing mortality (bottom) for 1989-2021 in the northern (purple line) and southern (yellow line) region. Polygons represent 95% confidence intervals.

Figure 3. Working Group assessment report Figure 4.2

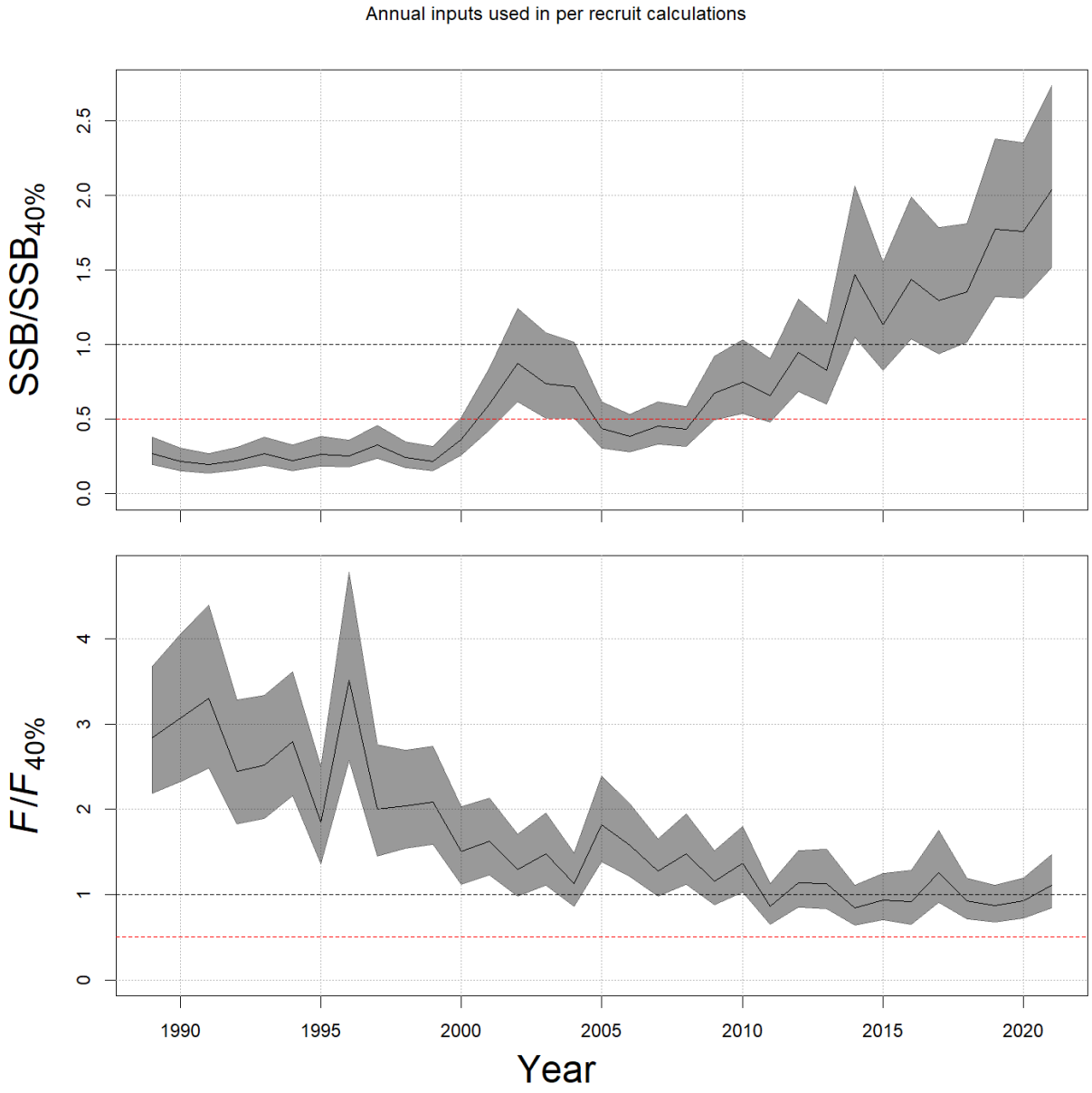

Figure 4. 2023 WG assessment report Figure 5.1. Status of total spawning stock biomass (top) and total fully-selected fishing mortality rates (bottom) relative to annual reference point estimates for 1989-2021. Gray polygon represents 95% confidence intervals.

The WG assessment report (Miller et al. 2023) noted that:

> "The objective of this research track is to develop the assessment and projection methodology that will be used in subsequent management track assessments. As such, stock status recommendations are not part of the research track Terms of Reference and the results from this research track assessment will not be used directly in management. Instead, this research track assessment will inform a management track assessment

scheduled for June 2024. The 2024 management track assessment will provide updated estimates of stock status using data through 2023 and will be used to inform management measures for 2025-2026."

6. Define appropriate methods for producing projections; provide justification for assumptions of fishery selectivity, weights at age, maturity, and recruitment; and comment on the reliability of resulting projections considering the effects of uncertainty and sensitivity to projection assumptions.

The Panel agreed that this ToR was **met** for Black Sea Bass.

The WG recommended that the suggested assessment model framework for Black Sea Bass, Multi-WHAM, which can do short-term projections internally, should be used for short term projections based on the proposed candidate model run. The assumptions of recruitment, growth, maturity, natural mortality, and selectivity used to make stochastic projections of stock size and catches for 2022-2024 use the same approach as used for the definition of reference points under ToR 5. Models for random effects on the bottom temperature covariate, recruitment, and survival are used to predict bottom temperature and abundance-at-age in the projection years. Region-specific average annual recruitment estimates for years after 1999 and the most recent 5-year average of age-specific maturity, SSB weight (by region), catch weight (by fleet), fleet selectivity (by fleet), and natural mortality estimates (by region) were used to conduct short-term projections. Random effects in the projections revert to the mean after a few years. The panel has no recommendation to change the approach suggested by the WG.

7. Review, evaluate, and report on the status of research recommendations from the last assessment peer review, including recommendations provided by the prior assessment working group, peer review panel, and SSC. Identify new recommendations for future research, data collection, and assessment methodology. If any ecosystem influences from TOR 2 could not be considered quantitatively under that or other TORs, describe next steps for development, testing, and review of quantitative relationships and how they could best inform assessments. Prioritize research recommendations.

The Panel agreed that this ToR has been **fully met**.

The WG thoroughly reviewed previous recommendations and updated their status. The WG also made new research recommendations classified as High priority, Medium priority and Low priority. The Panel suggests below a slightly different version of the prioritization of new research recommendations, including those from the panel, as: i) necessary for the management track, ii) high priority, iii) medium/long term and iv) low priority. Within each category, the order of the recommendations represents the Panel's suggestions.

Necessary for management track

Conduct sensitivity analyses including:

1) an exploration of alternative parameterizations for natural mortality (e.g. different age-independent constant values, or age-dependent M)

2) profiles of the initial fishing mortality (i.e. initial depletion)

3) an evaluation of which individual surveys should be included in the VAST index by comparing WHAM estimates (e.g., biomass time series) from the proposed run with individual fishery independent surveys. Surveys that do not appear to accurately reflect changes in stock size through this analysis should not be included in the VAST index.

High Priority

1. Examine the updated CPA indices for signs of hyperstability which can arise from a wide variety of factors, many of which cannot be simply addressed through better processing/estimation of the recreational CPA index.
2. Conduct additional research on scaling the recreational catch CVs to improve confidence in these data and the resulting CPA indices.
3. Further consider the development of a commercial CPUE index. The index reviewed by the WG includes data from a broad area, it can account for socioeconomic drivers of catch, and can be a useful tool for understanding changes in abundance and fisheries operations.
4. Develop a method to fully utilize all available fishery-dependent size data (e.g. from the Commercial Fisheries Research Foundation's black sea bass research fleet) even if it does not include market categories.
5. The WG developed dynamic reference points as output from the assessment. While current stock status has a relatively clear interpretation, the aim is for managers to maintain good stock status. With dynamic reference points, future stock status can systematically change without change in conventional estimates of MSY as interpreted by managers. This presents a challenge of trying to hit a moving target without knowledge of speed and direction of the target. The WG should provide managers with guidance on how to interpret this information to maintain a healthy stock.

Medium/long term

1. Evaluate the impact to the assessment model outputs of enhanced or diminished port sampling in the future to evaluate impacts of changes to data streams that support estimation of fishery length and age compositions.
2. Further consideration of the appropriate metrics for measuring recruitment as a response variable to environmental indicators.
3. Additional research into environmental drivers of recruitment.
4. Explore ways to fill gaps in bottom temperature data for use as an environmental indicator, including consideration of new data sources and analytical products.
5. Examine guidelines for integrating fishery-dependent indices in assessments developed by ICCAT to determine whether they could be useful for the BSB assessment. (https://www.iccat.int/Documents/CVSP/CV074_2017/n_2/CV074020404.pdf).

Low priority

1. Further evaluation of the socioeconomic drivers of recreational and commercial fishing for black sea bass and associated species.
2. Further evaluation of how expansion into the northern range of the stock may impact fishing behavior.
3. Explore separating age-length keys by semester, region, and fishery/survey after 2008 when more data are available.

8. Develop a backup assessment approach to providing scientific advice to managers if the proposed assessment approach does not pass peer review or the approved approach is rejected in a future management track assessment.

The Panel agreed that this ToR was **fully met**.

The Index-Based Research Track Working Group simulation-tested the performance of several empirical Index Based Methods (IBMs) (NEFSC 2020, Legault et al. 2023) and concluded that empirical methods such as Ismooth did not perform better than statistical catch-at-age models that required retrospective adjustment (e.g., the previous ASAP model used in the 2021 BSB assessment). The WG recommended that if the proposed multi-WHAM assessment model is rejected, an alternative simpler multi-WHAM model without random effects parameterized to mimic the previously accepted ASAP model should be used with a retrospective adjustment applied to the terminal year estimates of F and SSB. The Panel agrees that the proposed multi-WHAM model is acceptable (after evaluation of sensitivity runs recommended under TOR 4 are conducted) and that the alternative ASAP-like multi-WHAM model is likely to present worse diagnostics and performance than the proposed multi-WHAM model.

9. Identify and consider any additional stock specific analyses or investigations that are critical for this assessment and warrant peer review, and develop additional TOR(s)* to address as needed.

No additional TORs were developed by the WG.

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Appendix 1 - Terms of Reference for Black Sea Bass Research Track Stock Assessment

1. Identify relevant ecosystem and climate influences on the stock. Characterize the uncertainty in the relevant sources of data and their link to stock dynamics. Consider findings, as appropriate, in addressing other TORs. Report how the findings were considered under impacted TORs.

2. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.

3. Present the survey data used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, application of catchability and calibration studies, etc.) and provide a rationale for which data are used. Describe the spatial and temporal distribution of the data. Characterize the uncertainty in these sources of data.

4. Use appropriate assessment approach to estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Compare the time series of these estimates with those from the previously accepted assessment(s). Evaluate a suite of model fit diagnostics (e.g., residual patterns, sensitivity analyses, retrospective patterns), and (a) comment on likely causes of problematic issues, and (b), if possible and appropriate, account for those issues when providing scientific advice and evaluate the consequences of any correction(s) applied.

5. Update or redefine status determination criteria (SDC; point estimates or proxies for BMSY, BTHRESHOLD, FMSY and MSY reference points) and provide estimates of those criteria and their uncertainty, along with a description of the sources of uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for reference points. Compare estimates of current stock size and fishing mortality to existing, and any redefined, SDCs.

6. Define appropriate methods for producing projections; provide justification for assumptions of fishery selectivity, weights at age, maturity, and recruitment; and comment on the reliability of resulting projections considering the effects of uncertainty and sensitivity to projection assumptions.

7. Review, evaluate, and report on the status of research recommendations from the last assessment peer review, including recommendations provided by the prior assessment working group, peer review panel, and SSC. Identify new recommendations for future research, data collection, and assessment methodology. If any ecosystem influences from TOR 2 could not be considered quantitatively under that or other TORs, describe next steps for development, testing, and review of quantitative relationships and how they could best inform assessments. Prioritize research recommendations.

8. Develop a backup assessment approach to providing scientific advice to managers if the proposed assessment approach does not pass peer review or the approved approach is rejected in a future management track assessment.

Appendix 2 – Initial agenda for Black Sea Bass Research Track Assessment Peer Review meeting, December 5-7, 2023.

Tuesday, December 5, 2023

Time	Topic	Presenter(s)	Notes
9 a.m. - 9:15 a.m.	Welcome/Logistics Introductions/Agenda/ Conduct of Meeting	Michele Traver, Assessment Process Lead Larry Alade, Acting PopDy Branch Chief Olaf Jensen, Panel Chair	
9:15 a.m. - 9:45 a.m.	Introduction/Executive Summary	Anna Mercer (WG chair)/Kiersten Curti (assessment lead)	Biology, movement, management overview, flag areas of major progress in the RT (new data sources, indices, M exploration, discard mortality exploration, new model, ESP, etc)
9:45 a.m. - 10:30 a.m.	Term of Reference (TOR) #2	Julia Beaty, Kiersten Curti	Discard Mortality, Commercial catch CFRF Research Fleet data
10:30 a.m. - 10:45 a.m.	Break		
10:45 a.m. - 11:30 a.m.	TOR #2 cont.	Kiersten Curti, Sam Truesdell, Julia Beaty	Recreational catch
11:30 a.m. - 12:00 p.m.	Discussion/Summary	Review Panel	
12:00 p.m. - 12:15 p.m.	Public Comment	Public	

Time	Topic	Presenter(s)	Notes
12:15 p.m. - 1:15 p.m.	Lunch		
1:15 p.m. - 2:45 p.m.	TOR #3	Kiersten Curti, Sam Truesdell, Alex Hansell	NEFSC BTS, NEAMAP, State Surveys, Ventless Trap Survey, VAST indices
2:45 p.m. - 3:00 p.m.	Break		
3:00 p.m. - 3:45 p.m.	TOR #3 cont.	Jeff Brust, Andy Jones	Recreational CPA and Commercial CPUE
3:45 p.m. - 4:00 p.m.	Discussion/Summary	Review Panel	
4:00 p.m. - 4:15 p.m.	Public Comment	Public	
4:15 p.m.	Adjourn		

Wednesday, December 6, 2023

Time	Topic	Presenter(s)	Notes
9 a.m. - 9:05 a.m.	Welcome/Logistics Introductions/Agenda	Michele Traver, Assessment Process Lead Olaf Jensen, Panel Chair	
9:05 a.m. - 10:30 a.m.	TOR #1	Scott Large, Kiersten Curti, Jason McNamee, Anna Mercer	Time varying growth and maturity, Spatiotemporal modeling, Ecosystem indicators, Trophic ecology, Natural Mortality, Stakeholder engagement
10:30 a.m. - 10:45 a.m.	Break		
10:45 a.m. - 12:45 p.m.	TOR #4	Tim Miller Kiersten Curti	WHAM
12:45 p.m. - 1:45 p.m.	Lunch		
1:45 p.m. - 2:45 p.m.	TOR #5	Tim Miller Kiersten Curti	Reference Points
2:45 p.m. - 3:30 p.m.	TOR #6	Tim Miller, Kiersten Curti	Projections
3:30 p.m. - 4:00 p.m.	Discussion/Summary	Review Panel	
4:00 p.m. - 4:15 p.m.	Public Comment	Public	
4:15 p.m.	Adjourn		

Time	Topic	Presenter(s)	Notes
9 a.m. - 9:05 a.m.	Welcome/Logistics Introductions/Agenda	Michele Traver, Assessment Process Lead Olaf Jensen, Panel Chair	
9:05 a.m. - 10:15 a.m.	TOR #4 cont'	Gavin Fay Jason McNamee	SS
10:15 a.m. - 10:30 a.m.	Break		
10:30 a.m. - 10:45 a.m.	TOR #8	Kiersten Curti	Summarize WHAM recommended model; Alternative Assessment Approach
10:45 a.m. - 11:30 a.m.	TOR #7	Julia Beaty	Research Recommendations
11:30 a.m. - 12:00 p.m.	Discussion/Summary	Panel	
12:00 p.m. - 12:15 p.m.	Public Comment	Public	
12:15 p.m. - 1:15 p.m	Lunch		
1:15 p.m. - 4:00 p.m.	Report writing	Panel	
4:00 p.m.	Adjourn		

Appendix 3 - Performance Work Statement (PWS) - Center for Independent Experts (CIE) Program – Black Sea Bass Research Track Peer Review

Background

The National Marine Fisheries Service (NMFS) is mandated by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, and Marine Mammal Protection

Act to conserve, protect, and manage our nation's marine living resources based upon the best scientific information available (BSIA). NMFS science products, including scientific advice, are often controversial and may require timely scientific peer reviews that are strictly independent of all outside influences. A formal external process for independent expert reviews of the agency's scientific products and programs ensures their credibility. Therefore, external scientific peer reviews have been and continue to be essential to strengthening scientific quality assurance for fishery conservation and management actions.

Scientific peer review is defined as the organized review process where one or more qualified experts review scientific information to ensure quality and credibility. These expert(s) must conduct their peer review impartially, objectively, and without conflicts of interest. Each reviewer must also be independent from the development of the science, without influence from any position that the agency or constituent groups may have. Furthermore, the Office of Management and Budget (OMB), authorized by the Information Quality Act, requires all federal agencies to conduct peer reviews of highly influential and controversial science before dissemination, and that peer reviewers must be deemed qualified based on the OMB Peer Review Bulletin standards .

Scope
The Research Track Peer Review meeting is a formal, multiple-day meeting of stock assessment experts who serve as a panel to peer-review tabled stock assessments and models. The research track peer review is the cornerstone of the Northeast Region Coordinating Council stock assessment process, which includes assessment development, and report preparation (which is done by Working Groups or Atlantic States Marine Fisheries Commission (ASMFC) technical committees), assessment peer review (by the peer review panel), public presentations, and document publication. The results of this peer review will be incorporated into future management track assessments, which serve as the basis for developing fishery management recommendations.

The purpose of this meeting will be to provide an external peer review of the black sea bass stock. The requirements for the peer review follow. This Performance Work Statement (PWS) also includes: Annex 1: TORs for the research track, which are the responsibility of the analysts; Annex 2: a draft meeting agenda; Annex 3: Individual Independent Review Report Requirements; and Annex 4: Peer Reviewer Summary Report Requirements.

Requirements
NMFS requires three reviewers under this contract (i.e. subject to CIE standards for reviewers) to participate in the panel review. The chair, who is in addition to the three reviewers, will be provided by either the New England or Mid-Atlantic Fishery Management Council's Science and Statistical Committee; although the chair will be participating in this review, the chair's participation (i.e. labor and travel) is not covered by this contract.

Each reviewer will write an individual review report in accordance with the PWS, OMB Guidelines, and the TORs below. Modifications to the PWS and TORs cannot be made during the peer review, and any PWS or TORs modifications prior to the peer review shall be approved by the Contracting Officer's Representative (COR) and the CIE contractor. All TORs must be

addressed in each reviewer's report. The reviewers shall have working knowledge and recent experience in the use and application of index-based, age-based, and state-space stock assessment models, including familiarity with retrospective patterns, model diagnostics from various population models, and how catch advice is provided from stock assessment models. In addition, knowledge and experience with simulation analyses is helpful.

Tasks for Reviewers

- Review the background materials and reports prior to the review meeting
    - Two weeks before the peer review, the Assessment Process Lead will electronically disseminate all necessary background information and reports to the CIE reviewers for the peer review.
- Attend and participate in the panel review meeting
    - The meeting will consist of presentations by NMFS and other scientists, stock assessment authors and others to facilitate the review, to provide any additional information required by the reviewers, and to answer any questions from reviewers
- Conduct an independent peer review in accordance with the requirements specified in this PWS and TORs, in adherence with the required formatting and content guidelines.
- Reviewers are not required to reach a consensus. Individual reviewer perspectives should be provided in their individual reports, and any lack of consensus should be clearly described in the panel's summary report.
- Each reviewer shall assist the Peer Review Panel Chair with contributions to the Peer Review Panel's Summary Report.
- Deliver individual Independent Reviewer Reports to NMFS according to the specified milestone dates.
- This report should explain whether each research track Term of Reference was or was not completed successfully during the peer review meeting, using the criteria specified below in the "Tasks for Peer Review Panel."
- If any existing Biological Reference Points (BRP) or their proxies are considered inappropriate, the Independent Report should include recommendations and justification for suitable alternatives. If such alternatives cannot be identified, then the report should indicate that the existing BRPs are the best available at this time.
- During the meeting, additional questions that were not in the Terms of Reference but that are directly related to the assessments and research topics may be raised. Comments on these questions should be included in a separate section at the end of the Independent Report produced by each reviewer.
- The Independent Report can also be used to provide greater detail than the Peer Reviewer Summary Report on specific stock assessment Terms of Reference or on additional questions raised during the meeting.

Tasks for Review panel

- During the peer review meeting, the panel is to determine whether each research track Term of Reference (TOR) was or was not completed successfully. To make this determination, panelists should consider whether the work provides a scientifically credible basis for developing fishery management advice. Criteria to consider include: whether the data were adequate and used properly, the analyses and models were carried out correctly, and the conclusions are correct/reasonable. If alternative assessment models and model assumptions are presented,

evaluate their strengths and weaknesses and then recommend which, if any, scientific approach should be adopted. Where possible, the Peer Review Panel chair shall identify or facilitate agreement among the reviewers for each research track TOR.

- If the panel rejects any of the current BRP or BRP proxies (for BMSY and FMSY and MSY), the panel should explain why those particular BRPs or proxies are not suitable, and the panel should recommend suitable alternatives. If such alternatives cannot be identified, then the panel should indicate that the existing BRPs or BRP proxies are the best available at this time.
- Each reviewer shall complete the tasks in accordance with the PWS and Schedule of Milestones and Deliverables below.

Tasks for Peer Review Panel chair and reviewers combined:
Review the Report of Black Sea Bass Research Track Working Group.

The Peer Review Panel Chair, with the assistance from the reviewers, will write the Peer Reviewer Summary Report. Each reviewer and the chair will discuss whether they hold similar views on each research track Term of Reference and whether their opinions can be summarized into a single conclusion for all or only for some of the Terms of Reference of the peer review meeting. For terms where a similar view can be reached, the Peer Reviewer Summary Report will contain a summary of such opinions.

The chair's objective during this Peer Reviewer Summary Report development process will be to identify or facilitate the finding of an agreement rather than forcing the panel to reach an agreement. Again, the CIE reviewers are not required to reach a consensus. The chair will take the lead in editing and completing this report. The chair may express their opinion on each research track Term of Reference, either as part of the group opinion, or as a separate minority opinion. The Peer Reviewer Summary Report will not be submitted, reviewed, or approved by the Contractor.

Place of Performance
The place of performance shall be remote, via WebEx video conferencing.

Period of Performance
The period of performance shall be from the time of award through January, 2024. Each reviewer's duties shall not exceed 14 days to complete all required tasks.

Schedule of Milestones and Deliverables: The contractor shall complete the tasks and deliverables in accordance with the following schedule.

Within 2 weeks of award	Contractor selects and confirms reviewers
Approximately 2 weeks later	Contractor provides the pre-review documents to the reviewers
December 5 - 7, 2023	Panel review meeting

Approximately 2 weeks later	Contractor receives draft reports
Within 2 weeks of receiving draft reports	Contractor submits final reports to the Government

* The Peer Reviewer Summary Report will not be submitted to, reviewed, or approved by the Contractor.

Applicable Performance Standards
The acceptance of the contract deliverables shall be based on three performance standards:
(1) The reports shall be completed in accordance with the required formatting and content
(2) The reports shall address each TOR as specified
(3) The reports shall be delivered as specified in the schedule of milestones and deliverables.

Travel
No travel is necessary, as this meeting is being held remotely.

Restricted or Limited Use of Data
The contractors may be required to sign and adhere to a non-disclosure agreement.

NMFS Project Contact
Michele Traver, NEFSC Assessment Process Lead
Northeast Fisheries Science Center
166 Water Street, Woods Hole, MA 02543
Michele.Traver@noaa.gov

Annex 1. Generic Research Track Terms of Reference

1. Identify relevant ecosystem and climate influences on the stock. Characterize the uncertainty in the relevant sources of data and their link to stock dynamics. Consider findings, as appropriate, in addressing other TORs. Report how the findings were considered under impacted TORs.
2. Estimate catch from all sources including landings and discards. Describe the spatial and temporal distribution of landings, discards, and fishing effort. Characterize the uncertainty in these sources of data.
3. Present the survey data used in the assessment (e.g., indices of relative or absolute abundance, recruitment, state surveys, age-length data, application of catchability and calibration studies, etc.) and provide a rationale for which data are used. Describe the spatial and temporal distribution of the data. Characterize the uncertainty in these sources of data.
4. Use appropriate assessment approach to estimate annual fishing mortality, recruitment and stock biomass (both total and spawning stock) for the time series, and estimate their uncertainty. Compare the time series of these estimates with those from the previously accepted assessment(s). Evaluate a suite of model fit diagnostics (e.g., residual patterns, sensitivity analyses, retrospective patterns), and (a) comment on likely causes of problematic issues, and (b), if possible and appropriate, account for those issues when providing scientific advice and evaluate the consequences of any correction(s) applied.

5. Update or redefine status determination criteria (SDC; point estimates or proxies for BMSY, BTHRESHOLD, FMSY and MSY reference points) and provide estimates of those criteria and their uncertainty, along with a description of the sources of uncertainty. If analytic model-based estimates are unavailable, consider recommending alternative measurable proxies for reference points. Compare estimates of current stock size and fishing mortality to existing, and any redefined, SDCs.
6. Define appropriate methods for producing projections; provide justification for assumptions of fishery selectivity, weights at age, maturity, and recruitment; and comment on the reliability of resulting projections considering the effects of uncertainty and sensitivity to projection assumptions.
7. Review, evaluate, and report on the status of research recommendations from the last assessment peer review, including recommendations provided by the prior assessment working group, peer review panel, and SSC. Identify new recommendations for future research, data collection, and assessment methodology. If any ecosystem influences from TOR 2 could not be considered quantitatively under that or other TORs, describe next steps for development, testing, and review of quantitative relationships and how they could best inform assessments. Prioritize research recommendations.
8. Develop a backup assessment approach to providing scientific advice to managers if the proposed assessment approach does not pass peer review or the approved approach is rejected in a future management track assessment.
9. Identify and consider any additional stock specific analyses or investigations that are critical for this assessment and warrant peer review, and develop additional TOR(s)* to address as needed.

Research Track TORs:

General Clarification of Terms that may be
Used in the Research Track Terms of Reference

Guidance to Peer Review Panels about "Number of Models to include in the Peer Reviewer Report":

In general, for any TOR in which one or more models are explored by the Working Group, give a detailed presentation of the "best" model, including inputs, outputs, diagnostics of model adequacy, and sensitivity analyses that evaluate robustness of model results to the assumptions. In less detail, describe other models that were evaluated by the Working Group and explain their strengths, weaknesses and results in relation to the "best" model. If selection of a "best" model is not possible, present alternative models in detail, and summarize the relative utility each model, including a comparison of results. It should be highlighted whether any models represent a minority opinion.

On "Acceptable Biological Catch" (DOC Nat. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

Acceptable biological catch (ABC) is a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of Overfishing Limit (OFL) and any other scientific uncertainty…" (p. 3208) [In other words, OFL ≥ ABC.]

ABC for overfished stocks. For overfished stocks and stock complexes, a rebuilding ABC must be set to reflect the annual catch that is consistent with the schedule of fishing mortality rates in the rebuilding plan. (p. 3209)

NMFS expects that in most cases ABC will be reduced from OFL to reduce the probability that overfishing might occur in a year. (p. 3180)

ABC refers to a level of ''catch'' that is ''acceptable'' given the ''biological'' characteristics of the stock or stock complex. As such, Optimal Yield (OY) does not equate with ABC. The specification of OY is required to consider a variety of factors, including social and economic factors, and the protection of marine ecosystems, which are not part of the ABC concept. (p. 3189)

On "Vulnerability" (DOC Natl. Stand. Guidelines. Fed. Reg., v. 74, no. 11, 1-16-2009):

"Vulnerability. A stock's vulnerability is a combination of its productivity, which depends upon its life history characteristics, and its susceptibility to the fishery. Productivity refers to the capacity of the stock to produce Maximum Sustainable Yield (MSY) and to recover if the population is depleted, and susceptibility is the potential for the stock to be impacted by the fishery, which includes direct captures, as well as indirect impacts to the fishery (e.g., loss of habitat quality)." (p. 3205)

Participation among members of a Research Track Working Group:

Anyone participating in peer review meetings that will be running or presenting results from an assessment model is expected to supply the source code, a compiled executable, an input file with the proposed configuration, and a detailed model description in advance of the model meeting. Source code for NOAA Toolbox programs is available on request. These measures allow transparency and a fair evaluation of differences that emerge between models.

Annex 2. Draft Review Meeting Agenda
{Final Meeting agenda to be provided at time of award}

Black Sea Bass Track Assessment Peer Review Meeting

December 5 – 7, 2023

For Details, Please see the following link: https://www.fisheries.noaa.gov/event/black-sea-bass-2023-research-track-peer-review

Annex 3. Individual Independent Peer Reviewer Report Requirements

1. The independent Peer Reviewer report shall be prefaced with an Executive Summary providing a concise summary of whether they accept or reject the work that they reviewed, with an explanation of their decision (strengths, weaknesses of the analyses, etc.).

2. The report must contain a background section, description of the individual reviewers' roles in the review activities, summary of findings for each TOR in which the weaknesses and strengths are described, and conclusions and recommendations in accordance with the TORs. The independent report shall be an independent peer review, and shall not simply repeat the contents of the Peer Reviewer Summary Report.

a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including a concise summary of whether they accept or reject the work that they reviewed, and explain their decisions (strengths, weaknesses of the analyses, etc.), conclusions, and recommendations.

b. Reviewers should discuss their independent views on each TOR even if these were consistent with those of other panelists, but especially where there were divergent views.

c. Reviewers should elaborate on any points raised in the Peer Reviewer Summary Report that they believe might require further clarification.

d. The report may include recommendations on how to improve future assessments.

3. The report shall include the following appendices:

Appendix 1: Bibliography of materials provided for review
Appendix 2: A copy of this Performance Work Statement
Appendix 3: Panel membership or other pertinent information from the panel review meeting.

Annex 4. Peer Reviewer Summary Report Requirements

1. The main body of the report shall consist of an introduction prepared by the Research Track Peer Review Panel chair that will include the background and a review of activities and comments on the appropriateness of the process in reaching the goals of the peer review meeting. Following the introduction, for each assessment /research topic reviewed, the report should address whether or not each Term of Reference of the Research Track Working Group was completed successfully. For each Term of Reference, the Peer Reviewer Summary Report should state why that Term of Reference was or was not completed successfully. It should also include whether they accept or reject the work that they reviewed, with an explanation of their decision (strengths, weaknesses of the analyses, etc.)

To make this determination, the peer review panel chair and reviewers should consider whether or not the work provides a scientifically credible basis for developing fishery management

advice. If the reviewers and peer review panel chair do not reach an agreement on a Term of Reference, the report should explain why. It is permissible to express majority as well as minority opinions.

The report may include recommendations on how to improve future assessments.

2. If any existing Biological Reference Points (BRPs) or BRP proxies are considered inappropriate, include recommendations and justification for alternatives. If such alternatives cannot be identified, then indicate that the existing BRPs or BRP proxies are the best available at this time.

3. The report shall also include the bibliography of all materials provided during the peer review meeting, and relevant papers cited in the Peer Reviewer Summary Report, along with a copy of the CIE Performance Work Statement.

The report shall also include as a separate appendix the assessment Terms of Reference used for the peer review meeting, including any changes to the Terms of Reference or specific topics/issues directly related to the assessments and requiring Panel advice.

Appendix 4 - Materials provided or referenced during the Black Sea Bass Research Track Stock Assessment Peer Review meeting

Working papers and presentations were available on a NEFSC website (https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php) by selecting the species and year of assessment.

Working Papers and Background Documentation:

2023_BSB_UNIT_BackLit_2016.SAW62.NEFSC.CRD.17-03.pdf
2023_BSB_UNIT_BackLit_Cope_Hamel_2022.pdf
2023_BSB_UNIT_BackLit_Miller.et.al.2016.PlosONE.pdf
2023_BSB_UNIT_BackLit_Moser.Shepherd.2009.JNWAFS.pdf
2023_BSB_UNIT_ReadMe_Document_V2_12_2_2023.pdf
2023_BSB_UNIT_WP_Beatyetal2023_DiscardMortality.pdf
2023_BSB_UNIT_WP_Brustetal2023_RecCPA.pdf
2023_BSB_UNIT_WP_Curtietal_a_2023_CommercialCatch.pdf
2023_BSB_UNIT_WP_Curtietal_b_2023_SpatialDistribution.pdf
2023_BSB_UNIT_WP_Fayetal2023_StockSynthesisApp.pdf
2023_BSB_UNIT_WP_Hansell_Curti2023_VAST_V2.pdf
2023_BSB_UNIT_WP_Jones_Mercer2023_CommCPUE.pdf
2023_BSB_UNIT_WP_McMahan_Tabenderal2023_FoodHabits.pdf
2023_BSB_UNIT_WP_McNamee2023_NaturalMortality.pdf

2023_BSB_UNIT_WP_Merceretal2023_StakeholderKnowledge.pdf
2023_BSB_UNIT_WP_Miller2023_Multi-WHAM.pdf
2023_BSB_UNIT_WP_Milleretal2023_WHAM.pdf
2023_BSB_UNIT_WP_Paintenetal2023_VentlessTrapSurvey.pdf
2023_BSB_UNIT_WP_Tabenderaetal2023_EcosystemConsiderations.pdf
2023_BSB_UNIT_WP_Truesdell_Curti_a_2023_RecreationalCatch.pdf
2023_BSB_UNIT_WP_Truesdell_Curti_b_2023_AgeLengthKeys.pdf
2023_BSB_UNIT_WP_Truesdell_Curti_c_2023_Surveys.pdf
2023_BSB_UNIT_WP_Verkampetal2023_CFRFResearchFleet.pdf

Presentations

2023_BSB_UNIT_ppt_Intro.pdf
2023_BSB_UNIT_ppt_TOR1_agelengthkeys.pdf
2023_BSB_UNIT_ppt_TOR1_biology.pdf
2023_BSB_UNIT_ppt_TOR1_ecosystemindicators.pdf
2023_BSB_UNIT_ppt_TOR1_naturalmortality.pdf
2023_BSB_UNIT_ppt_TOR1_stakeholderknowledge.pdf
2023_BSB_UNIT_ppt_TOR2_commercialdata.pdf
2023_BSB_UNIT_ppt_TOR2_discardmortality.pdf
2023_BSB_UNIT_ppt_TOR2_recreationaldata.pdf
2023_BSB_UNIT_ppt_TOR2_totalfisherycatch.pdf
2023_BSB_UNIT_ppt_TOR3_VAST.pdf
2023_BSB_UNIT_ppt_TOR3_VAST_revisedindexplots.pdf
2023_BSB_UNIT_ppt_TOR3_commercialCPUE.pdf
2023_BSB_UNIT_ppt_TOR3_recreationalCPA.pdf
2023_BSB_UNIT_ppt_TOR3_surveyindices.pdf
2023_BSB_UNIT_ppt_TOR4-6_stocksynthesis.pdf
2023_BSB_UNIT_ppt_TOR4_MultiWHAM.pdf
2023_BSB_UNIT_ppt_TOR4_WHAMforBSB_V2.pdf
2023_BSB_UNIT_ppt_TOR5-6_WHAMreferencepoints_projections.pdf
2023_BSB_UNIT_ppt_TOR7_researchrecommendations.pdf
2023_BSB_UNIT_ppt_TOR8_backupapproach_V2.pdf

Appendix 5 - Meeting attendees at the Black Sea Bass Research Track Stock Assessment Peer Review meeting

Black Sea Bass Research Track Peer Review Attendance
December 5-7, 2023

GARFO - Greater Atlantic Regional Fisheries Office
MAFMC - Mid Atlantic Fisheries Management Council
NEFSC - Northeast Fisheries Science Center

NJDEP - New Jersey Department of Environmental Protection
NYSDEC - New York State Department of Environmental Conservation
RIDEM - Rhode Island Department of Environmental Management
SMAST - University of Massachusetts School of Marine Science and Technology
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Olaf Jensen - Chair
Sven Kupschus - CIE Panel
JJ Maguire - CIE Panel
Joel Rice - CIE Panel

Larry Alade - NEFSC, Acting Population Dynamics Branch Chief
Michele Traver - NEFSC, Assessment Process Lead

Abby Tyrell - NEFSC
Adelle Molina - Stony Brook University
Aleksandra Bavdaz - SensFish
Alex Dunn - NEFSC
Alex Hansell - NEFSC
Alicia Miller - NEFSC
Andy Jones - NEFSC
Amanda Hart - NEFSC
Anna Mercer - NEFSC
Brandon Muffley - MAFMC Staff
Brian Linton - NEFSC
Charles Adams - NEFSC
Charles Perretti - NEFSC
Chengxue Li - NEFSC
Chris Legault - NEFSC
Dave McElroy - NEFSC
Elizabeth Soranno - Commercial Fisheries Research Foundation
Emily Keiley - GARFO
Emily Liljestrand - NEFSC
Gary Shepherd - former NEFSC employee
Gavin Fay - SMAST
Giovanni Gianesin - NEFSC
Greg DiDomenico - Lund's Fisheries
Hannah Verkamp - Commercial Fisheries Research Foundation
Jason Boucher - NEFSC
Jason McNamee - RIDEM
Jeffrey Brust - NJDEP
Jeff Kaelin - Lund's Fisheries
Jessica Blaylock - NEFSC
John Maniscalco - NYSDEC
Joseph Beneventine - Recreational fishing industry
Julia Beaty - MAFMC
Kate Wilke - The Nature Conservancy
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Kathy Sosebee - NEFSC
Kiersten Curti - NEFSC
Laura Solinger - NEFSC
Marissa McMahan - Manomet
Mary Kate Munley - NEFSC
Meghan Lapp - SeaFreeze Ltd.
Mike Celestino - NJDEP
Mike Simpkins - NEFSC
Olaf Ormseth - Independent contractor
Remy Gatins - Northeastern University
Sarah Salois - NEFSC
Sam Truesdell - NEFSC
Scott Large - NEFSC
Sefatia Romeo Theken - Deputy Commissioner, MA Department of Fish and Game
Stephanie Owen - NEFSC
Steve Cadrin - SMAST
Steve Cannizzo - New York Recreational & For-Hire Fishing Alliance
Steve Doctor - Maryland Fisheries Service Department of Natural Resources
Steve Witthuhn - Rec. Captain, Top Hook Charters
Tara Trinko Lake - NEFSC
Tim Miller - NEFSC
Toni Chute - NEFSC
Tony Wood - NEFSC
Tracey Bauer - North Carolina DMF

New England Fishery Management Council

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

MEMORANDUM

DATE: January 19, 2024

TO: NEFMC and MAFMC

FROM: Jenny Couture and Robin Frede, NEFMC Staff; Jason Didden, MAFMC Staff

SUBJECT: **Sturgeon Framework Adjustment Alternative Packages**

The Sturgeon Bycatch Fishery Management Action Team/Plan Development Team (FMAT/PDT) developed four packages of alternatives that are designed to reduce Atlantic sturgeon bycatch. The packages use time/area closures and/or gear modifications based on the range of alternatives approved by both Councils in the fall of 2023. The FMAT/PDT also considered recent input from NMFS on bycatch reduction targets. The previous alternatives from the Councils could have resulted in tens of thousands of unique combinations, so four packages were constructed to create a reasonable range of alternatives that could be analyzed in time for April 2024 final action. The packages range from high to low impacts in terms of potential reduction in sturgeon bycatch and impacts to both fisheries. One package includes gear modifications only. The Councils may select any one of these alternatives, modify them, or create a hybrid option (e.g., a combination of multiple alternatives) leading up to final action. However, there will be minimal time for additional analyses before April 2024.

The subset of the draft Environmental Assessment includes the following information:

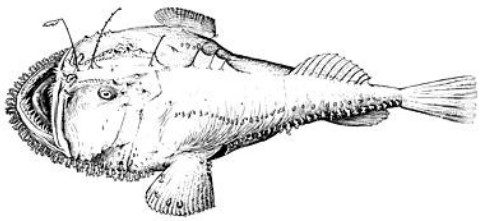
- Methods for determining the sturgeon bycatch polygons where time/area closures and gear restrictions would apply;
- Alternatives under Consideration including No Action; and
- Draft Affected Environment (subject to further revision)

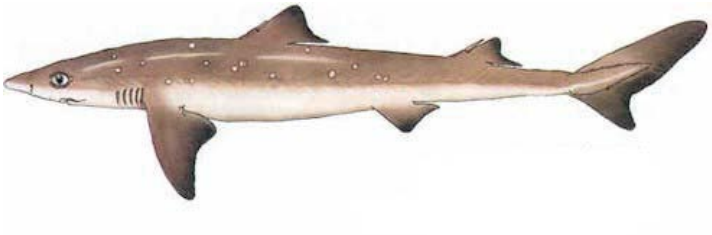
Draft impact analyses will be presented to the Joint Monkfish and Spiny Dogfish Advisory Panel meeting (March 5th) and the Joint Monkfish and Spiny Dogfish Committee meeting (March 13th) where preferred alternatives will be identified.

Staff requests that the Councils review and endorse the current packages of alternatives for additional analysis and presentation to the Advisors and Joint Committee.

Joint Framework Action to Reduce Sturgeon Bycatch in Monkfish and Spiny Dogfish Fisheries

Monkfish Framework Adjustment 15
Spiny Dogfish Framework Adjustment 6





Environmental Assessment

Draft

January 26, 2024

Prepared by the
New England Fishery Management Council and the
Mid-Atlantic Fishery Management Council
in consultation with the
National Marine Fisheries Service

New England Fishery Management Council

NOAA

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Document history

Initial Meetings:	April 18, 2023 (NEFMC)
	June 7, 2023 (MAFMC)
Final Meetings Planned:	April 9-11, 2024 (MAFMC)
	April 16-18, 2024 (NEFMC)
Preliminary Submission:	May X, 2024
Final Submission:	X, 2024

Cover image

NOAA image

MONKFISH AND SPINY DOGFISH FISHERY MANAGEMENT PLANS

MONKFISH FRAMEWORK ADJUSTMENT 15

SPINY DOGFISH FRAMEWORK ADJUSTMENT 6

Proposed Action: Propose management measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish fisheries to ensure compliance with the Endangered Species Act.

Responsible Agencies:

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

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

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

For Further Information:

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

Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
Phone: (302) 526-5255
Fax: (302) 674-5399

Abstract: The New England Fishery Management Council and the Mid-Atlantic Fishery Management Council, in consultation with NOAA Fisheries, have prepared Framework Adjustment 15 to the Monkfish Fishery Management Plan and Framework Adjustment 6 to the Spiny Dogfish Fishery Management Plan. This Environmental Assessment presents the range of alternatives to achieve the purpose and need of the action. The proposed action includes measures to reduce sturgeon bycatch in the commercial monkfish and spiny dogfish gillnet fisheries. This document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives. This document also addresses other requirements of the National Environmental Policy Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Regulatory Flexibility Act, and other applicable laws.

2.0 TABLE OF CONTENTS

2.1 TABLES

2.2 FIGURES

2.3 MAPS

2.4 ACRONYMS AND WORDING CONVENTIONS

“	**inches**
ABC	**Acceptable Biological Catch**
ACL	**Annual Catch Limit**
ACT	**Annual catch target**
ASMFC	**Atlantic States Marine Fisheries Commission or Commission**

B	**Biomass**
BOEM	**Bureau of Offshore Energy Management**
CFR	**Code of Federal Regulations**
CV	**coefficient of variation**
DAH	**Domestic Annual Harvest**
DAP	**Domestic Annual Processing**
DAS	**Days at Sea**
EA	**Environmental Assessment**
EEZ	**Exclusive Economic Zone**
EFH	**Essential Fish Habitat**
EIS	**Environmental Impact Statement**
ESA	**Endangered Species Act of 1973**
F	**Fishing Mortality Rate**
FMP	**Fishery Management Plan**
FR	**Federal Register**
GB	**Georges Bank**
GOM	**Gulf of Maine**
M	**Natural Mortality Rate**
MAFMC	**Mid-Atlantic Fishery Management Council**
MMPA	**Marine Mammal Protection Act**
MSA	**Magnuson-Stevens Fishery Conservation and Management Act**
MSY	**Maximum Sustainable Yield**
MT (or mt)	**Metric Tons (1 mt equals about 2,204.62 pounds)**
MTA	**Management Track Assessment**
NE	**Northeast**
NEFMC	**New England Fishery Management Council**
NEFSC	**Northeast Fisheries Science Center**
NEPA	**National Environmental Policy Act**
NFMA	**Northern Fishery Management Area**
NMFS	**National Marine Fisheries Service (NOAA Fisheries)**
NOAA	**National Oceanic and Atmospheric Administration**
OFL	**Overfishing Level**
OY	**Optimum Yield**
PBR	**Potential Biological Removal**
RTA	**Research Track Assessment**
SFMA	**Southern Fishery Management Area**
SSC	**Scientific and Statistical Committee**
TAL	**Total allowable landings**
U.S.	**United States**
VTR	**Vessel Trip Report**

4.0 DRAFT ALTERNATIVES UNDER CONSIDERATION

The Councils considered the alternatives in this section. Alternatives considered but rejected are briefly described in Section 4.6. The four action alternatives are packages of time/area closures and/or gear restrictions for the federal monkfish and spiny dogfish fisheries. These alternatives are designed to represent a robust range of measures:

Alternative 1: No action.

Alternative 2: Higher impacts; time/area closures and gear restriction measures.

Alternative 3: Intermediate impacts; time/area closures and gear restriction measures.

Alternative 4: Lower impacts; time/area closures and gear restriction measures.

Alternative 5: Only gear restriction measures.

The Councils may select any one of these alternatives, modify them, or create a hybrid option leading up to final action (e.g., a combination of multiple alternatives). The alternatives were constructed as packages to allow for meaningful analyses of the impacts of the measures that might be implemented. Considering every possible combination would have resulted in tens of thousands of permutations that would have been impossible to analyze in a meaningful and timely manner. All packages cover multiple sturgeon take hotspots so that benefits to sturgeon and impacts to the fisheries are spread geographically across the various areas of higher sturgeon takes.

The time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal spiny dogfish or monkfish fishing permit. The Atlantic States Marine Fisheries Commission (ASMFC) is expected to consider complementary action to reduce sturgeon interactions by state vessels in state waters.

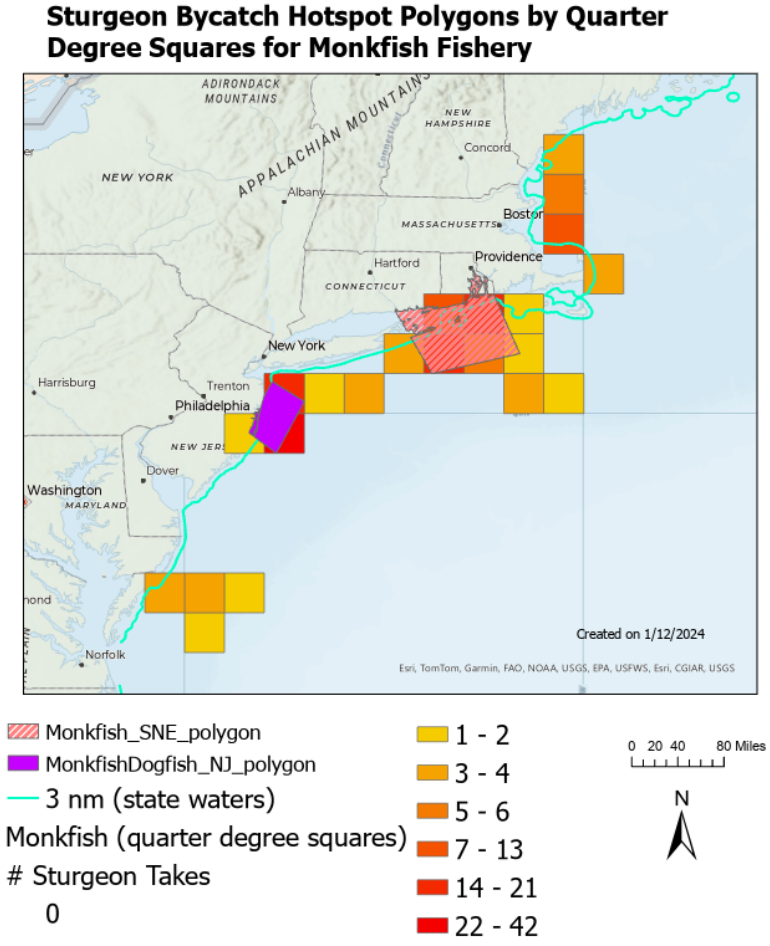
Methods for determining the sturgeon bycatch polygons where time/area closures and gear restrictions would apply

To map sturgeon take hotspots, sturgeon takes summed across 2017-2019 and 2021-2022 were quantified by 10-minute squares and shaded accordingly. Given these 10-minute squares represent confidential data, only quarter degree squares with shading are included in Figure 1 and Figure 2. The Councils were primarily interested in encompassing the bycatch hotspots with a 1-mile buffer approximately based on straight lines parallel to shore (estimating 6-9 miles offshore).

- Orange and red squares represent areas with higher takes, and groupings of these darker squares were considered hotspots. The edges of hotspots often appeared as yellow ten-minute squares.
- Boundaries of the polygons were drawn using the following criteria: If the outer-most edge of a hotspot cluster is an orange or red ten-minute square, the boundary line extends approximately one mile beyond the edge of the square. This allows for some buffer to address the potential for shifting effort. If the outer edge is a yellow ten-minute square, the boundary line is drawn at least approximately one mile out from the point where a take occurred in that yellow square. This was because yellow squares represented fewer takes and were often already on the edge of a hotspot rather than within a hotspot. Note that there are some instances where the boundary line is larger than 1 mile given the initial criteria to draw boundaries from the edges of the red and orange ten-minute squares.

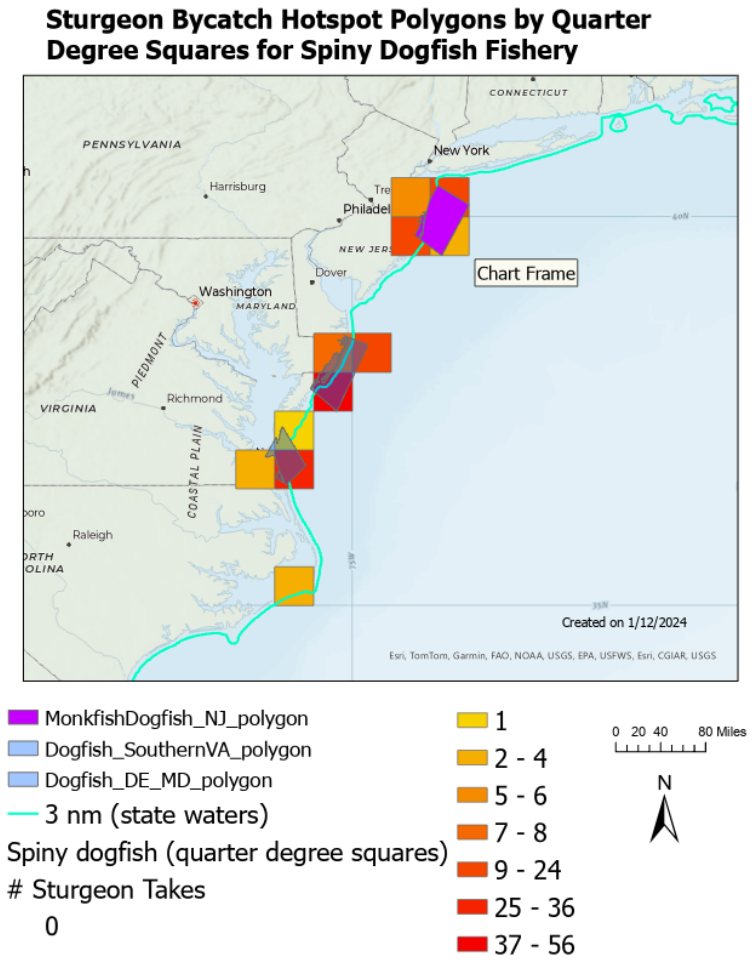
- The western area boundaries were clipped to the shore for all hotspot locations to prevent shifting effort into shallower state waters where there will likely be sturgeon present. Note, this Council action only applies to vessels with a federal fishing permit targeting monkfish and spiny dogfish in federal and state waters; ASMFC is expected to take complementary action for state only vessels fishing in state waters.
- The offshore portion of the polygon latitude and longitude values were then rounded to either the nearest 0.05 or 0.1 to help improve implementation of measures and enforcement.

Figure 1. Sturgeon bycatch hotspots in the monkfish fishery; shown as quarter degree squares due to data confidentiality.



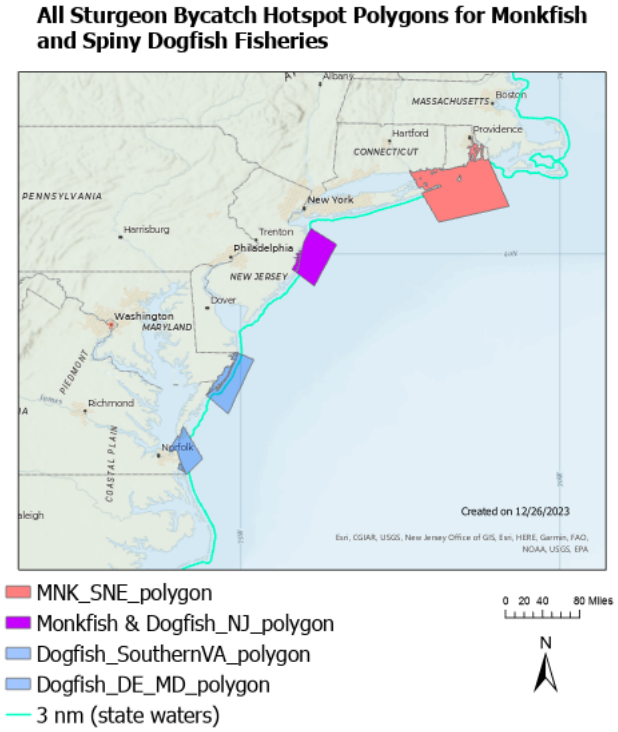
Source: 2017-2019 and 2021-2022 observer data

Figure 2. Sturgeon bycatch hotspots in the spiny dogfish fishery; shown as quarter degree squares due to data confidentiality.



Source: 2017-2019 and 2021-2022 observer data

Figure 3. All sturgeon bycatch hotspot polygons for the monkfish and spiny dogfish fisheries.



For monkfish gear measures, a January 1, 2026 implementation date is used, based on input from industry about the time needed to procure new gear with the required specifications. This delay would also allow for the Habor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets (≥7") in the Harbor Porpoise regulations during applicable months (January-April).

Note: observed sturgeon interactions were based on:

- Hauls where monkfish and spiny dogfish are caught and recorded by the observer as either TARG1 or TARG2 species for gillnet trips with mesh size ≥ 5 inches (" = inches for measurements hereafter). Monkfish and skate are caught on the same trip so it is important to include records where monkfish is not listed as the TARG1 species, for example. This is consistent with what was done in the Sturgeon Action Plan.
- Only records that denote 'spiny dogfish' as target species and exclude records for 'smooth dogfish' and 'unknown' records. Spiny dogfish is the only dogfish species managed by the MAFMC.
- Data subset by two mesh size groups: 1) ≥ 5" - < 7" and 2) ≥ 7" based on how the spiny dogfish and monkfish fisheries operate.
- Data from 2017-2019 and 2021-2022 were included to evaluate the most recent five years of observer data to adequately account for interannual variability, exclude 2020 when observer coverage was very low due to the global pandemic, and to help be consistent with the new Biological Opinion which is likely to use the same set of years.
- Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022.

There were **175** observed sturgeon takes in the **monkfish fishery** and *180* observed sturgeon takes in the *spiny dogfish fishery*, based on the previously described methodology and fishery definitions. In the

alternative rationales below, the percent of observed sturgeon takes in a given month and polygon are based on the number of observed sturgeon takes in just the relevant fishery. For example, there were 6 observed sturgeon takes in the **monkfish** fishery in the SNE polygon in April, which represents 3% of total observed takes in the **monkfish fishery** (6 out of **175** total observed takes in the monkfish fishery).

Note: Low-profile gillnet gear mentioned below is defined based on research by Fox et al. (2012 and 2019) and He and Jones (2013) in New Jersey:

- Mesh size ranging from 12 to 13 inches,
- Net height ranging from 6 to 8 meshes tall,
- Net length of 300 feet,
- Tie-down length of at least 24 inches to 48 inches max[1],
- Tie-down spacing of 12 feet,
- Primary hanging ratio of 0.50,
- Twine size 0.81mm, and
- Net is tied at every float to keep float line down.

General Observer Coverage in Relevant Areas

The statistical areas that are most relevant for the polygons include 539, 537, 613, 612, 615, 614, 621, 625, and 631. For each statistical area, the number of commercial trips and the number of observed trips from [2017, 2018, 2019, 2021, 2022 (not 2020)] were tallied and compared. For spiny dogfish, commercial trips were tallied based on if spiny dogfish made up at least 40% of the landed weight. Monkfish commercial trip counts were based on landing monkfish and using ≥10" mesh. Tallies of observed trips were based on species targeted (target species 1 or 2 indicated as the relevant species). Trip counts and coverage levels for statistical areas near relevant polygons are provided for each fishery in Table 3 and Table 4.

Table 1. Spiny Dogfish Observer Coverage Summary.

Statistical Area	Polygon Proximity	Spiny Dogfish Commercial Trips	Spiny Dogfish Observed Trips	Percent Observer Coverage
612	NJ	591	61	10%
615	NJ	369	72	20%
614	NJ	626	105	17%
621	MD/VA	827	102	12%
625	MD/VA	1232	79	6%
631	MD/VA	2633	308	12%

*Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022; accessed January 2024***.**

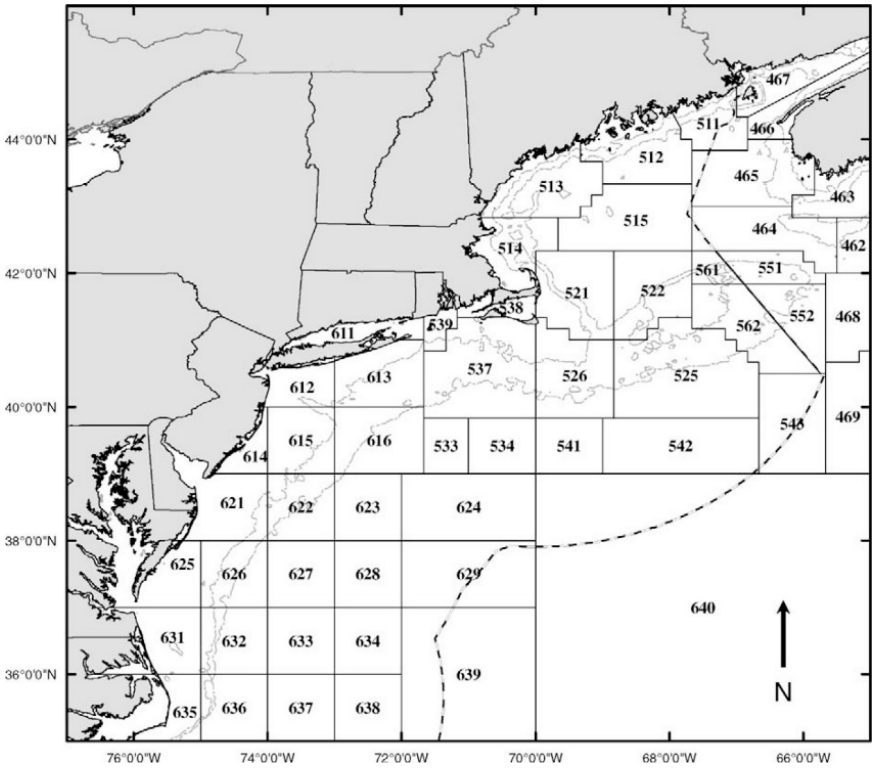
[1] The Harbor Porpoise regulations specify a 48" maximum tie-down length during the specified months; the FMAT wanted to accommodate these regulations and also enable ongoing/future research on testing low-profile gear with different tie-down lengths.

Table 2. Monkfish Observer Coverage Summary.

Statistical Area	Polygon Proximity	Monkfish Commercial Trips	Monkfish Observed Trips	Percent Observer Coverage
539	SNE	882	92	10%
537	SNE	3439	441	13%
613	SNE	2316	260	11%
612	NJ	772	86	11%
615	NJ	1229	136	11%

Data source: unpublished observer data and CAMS trip data from 2017, 2018, 2019, 2021, 2022; accessed January 2024.

Figure 4. NMFS Statistical Areas.



4.1 ALTERNATIVE 1 - NO ACTION

Under Alternative 1 (No Action), the current federal measures for the monkfish and spiny dogfish gillnet fisheries would remain – new measures to reduce sturgeon bycatch would not be implemented in 2024 through Council action. This alternative would not follow the sturgeon action plan's recommendation for developing measures to reduce sturgeon bycatch. The action plan laid out two possible paths to achieve a reduction in sturgeon bycatch by 2024. The recommended path was through action by the MAFMC and

the NEFMC. Selection of Alternative 1 (No Action) by the Councils may mean that NMFS takes action via a second path, under ESA rule-making processes.

4.2 Alternative 2 – High Impact Sturgeon Package (Most Time/Area Closures and Gear Restrictions)

Under Alternative 2, there would be a broad array of time/area closures and gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in the Atlantic sturgeon bycatch hotspot areas (Figure 5, Figure 6, Figure 7).

The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using ≥10" mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - <10". Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026.

The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 2 includes the following time/area closures and gear restrictions:

<u>Vessels with a federal fishing permit targeting monkfish in federal and/or state waters</u>

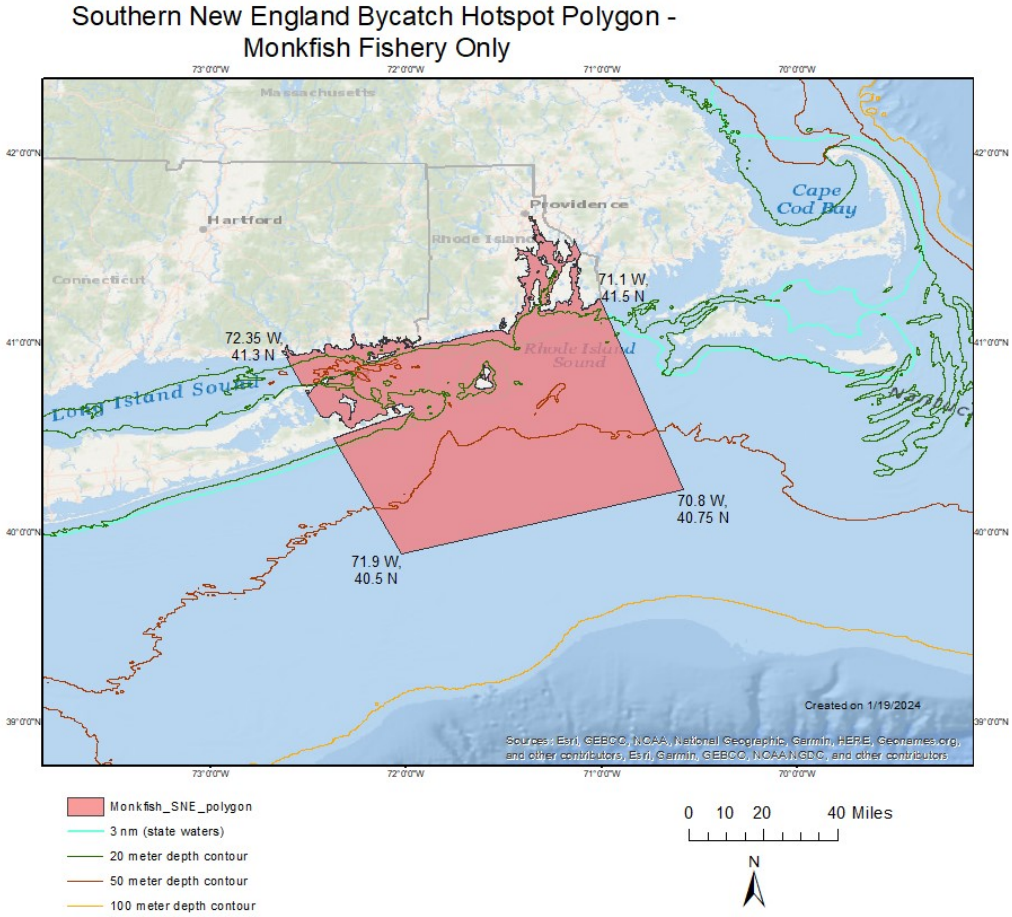
- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 5) during **April 1 – May 31**, and **December 1 – December 31.**
- Closure in New Jersey bycatch hotspot polygon (Figure 6) during **May 1 – May 31,** and **October 15 – December 31.**
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 6) in the rest of year when above polygon closure is not in effect (June 1 – October 14 and January 1 – April 30).

<u>Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters</u>

- Closure in New Jersey bycatch hotspot polygon (Figure 6) during **May 1 – May 31** and **October 15 – December 31**.
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 7) during **November 1 – March 31.**

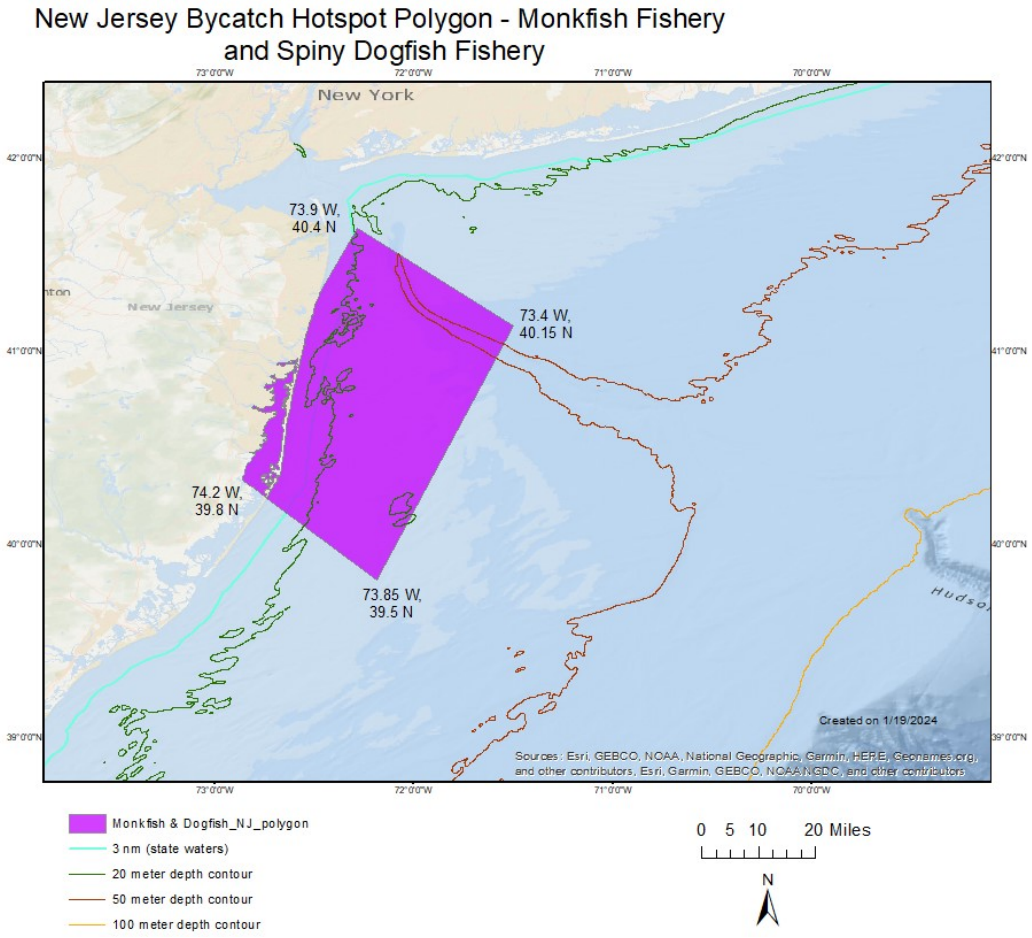
These time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. The Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 5. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.



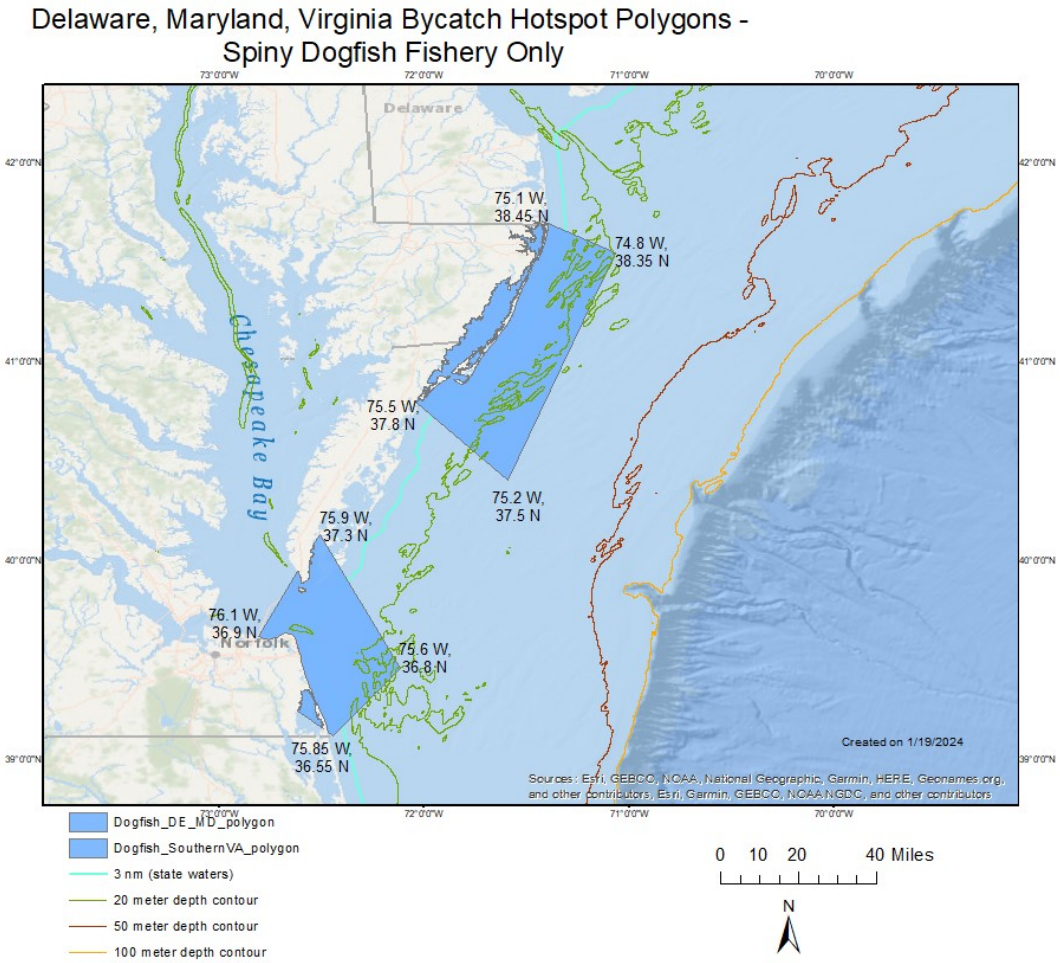
Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 5, Figure 8, and Figure 11 are identical.

Figure 6. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 6, Figure 9, Figure 12, and Figure 14 are identical.

Figure 7. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Note: The same figures are repeated in each action alternative, so the reader does not have to search for figures in other parts of the document. Accordingly, Figure 7, Figure 10, Figure 13, and Figure 15 are identical.

Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would reduce both number of sturgeon takes and sturgeon mortality. This high impact Alternative would have the most beneficial impacts for sturgeon and facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon

takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
    - April had 6 observed sturgeon takes in the SNE polygon, representing ~3% of total observed gillnet takes on trips targeting monkfish from 2017-2019 and 2021-2022. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 2.
    - May had 31 observed sturgeon takes in the SNE polygon, representing ~18% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
    - December had 33 observed sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
- New Jersey monkfish fishery
    - May had 23 observed takes in the NJ polygon, representing ~13% of total observed takes on trips targeting monkfish from 2017-2019 and 2021-2022. Note that there is a closure from the Harbor Porpoise Take Reduction Plan[2]; April 1 – 20 is closed to large mesh 7" + gillnet closure in the Waters off New Jersey management area which overlaps the NJ polygon. Initial feedback from OLE is this 10-day opening between closures does not pose an enforcement issues.
    - October 15 – December 31 had 29 observed sturgeon takes in the New Jersey polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
        - This time period is conservative for the monkfish fishery given all of the observed takes occurred in December, however, there was a desire to have the time period for the New Jersey polygon to be the same for the monkfish and spiny dogfish fisheries.
- New Jersey spiny dogfish fishery
    - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
    - October 15 – December 31 had 33 observed takes in the New Jersey polygon, representing ~18% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
    - Across both Mid-Atlantic polygons, November through March had 107 observed takes, representing ~59% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that

[2] Harbor Porpoise Take Reduction Plan information and a map of the New Jersey April 1-20 large mesh closure can be found here: https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/harbor-porpoise-take-reduction-plan.

this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

- In the Fox et al., 2011 study, the researchers tested the influence of tie-downs on sturgeon bycatch using gillnets of standard height (12 meshes high) and found no significant differences in sturgeon bycatch but did find significantly lower target species catches in the gear configuration without tie downs. In the follow-up 2012 study, the researchers tested a low-profile gear configuration with the same tie-down configuration and net height 6 meshes high and found significantly lower sturgeon bycatch in the low-profile nets and lower (though not significant) target species landings (monkfish and winter skate). In their subsequent 2013 study where net height increased from 6 to 8 meshes, the researchers found lower (but not significant) sturgeon bycatch in the low-profile net and similar (not significant) rates of target species landings. Lastly, in the 2019 Fox et al study where mesh size was increased from 12 to 13 inches and twine size decreased from 0.90 to 0.81mm, the researchers found the low-profile net reduced sturgeon bycatch by a ratio of 4.2 to 1. The lighter twine is intended to reduce retention of larger sturgeon while the larger mesh size allows smaller sturgeon to escape. Results for target species catches were mixed, with the vessel based out of New York catching significantly fewer monkfish with the low-profile net, while there was no significant difference between monkfish catch by the vessel fishing out of New Jersey. Catches of winter skate were not significantly different for either vessel. In the He and Jones (2013) study, researchers tested the low-profile net design from the Fox et al 2013 study off Virginia and Maryland and found sturgeon bycatch was significantly reduced with the low-profile net, though only seven sturgeon were caught in total. Results for target species catches were mixed, with one vessel having no significant difference in monkfish catch while the other vessel had significantly lower monkfish catch with the low-profile net particularly when catch rates are high. There were no significant differences in winter skate catch. All studies had relatively low sample sizes and results are considered uncertain. Table 5 summarizes the gear studies described above.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets (≥7") in the Harbor Porpoise regulations during applicable months (January-April).

Table 3. Gillnet configurations used and sturgeon bycatch and target species catch results in Fox et al 2011, 2012, 2013, and 2019.

Fox et al 2011

	Mesh Size (in.)	Net Height (# Mesh)	Tie Down Length (ft)	Tie Down Spacing (ft)	Hanging Ratio	Net Length (ft)	Twine Diameter (mm)	Sturgeon Catch (# individuals)		Target Species Landings (kg)		
Control	12	12	4	24	0.5	300	0.90	18	Not significantly different	Monkfish 7,306.3	Winter skate 10,048.5	Experimental nets (no tie-downs) significantly reduced catch rates
Experimental	12	12	N/A	N/A	0.5	300	0.90	5		Monkfish 3,737.9	Winter skate 1,782.3	
Fox et al 2012												
Control	12	12	4	24	0.5	300	0.90	28	Significantly lower in low-profile nets	Monkfish 4,345	Winter skate 11,921	No significant differences, though overall catch rates lower with low-profile nets
Experimental	12	6	2	12	0.5	300	0.90	9		Monkfish 3,341	Winter skate 9,734	
Fox et al 2013												
Control	12	12	4	24	0.5	300	0.90	21	Not significantly different	Monkfish 2,615.5	Winter skate 2,417.6	Similar catch rates, not significantly different
Experimental	12	8	2	12	0.5	300	0.90	14		Monkfish 2,388.7	Winter skate 2,103.2	
Fox et al 2019												
Control	12	12	4	24	0.5	300	0.90	25	Significantly lower in low-profile nets	Monkfish 32,333	Winter skate 35,010	Monkfish catch significantly lower with low-profile nets for NY, no sig. differences for NJ; no sig. differences in winter skate catch for either
Experimental	13	8	2	12	0.5	300	0.81	6				

4.3 ALTERNATIVE 3 – INTERMEDIATE IMPACT STURGEON PACKAGE

Under Alternative 3, a subset of the time/area closures and gear restrictions under consideration in Alternative 2 for both the federal monkfish and spiny dogfish gillnet fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas (Figure 8, Figure 9, Figure 10). This alternative is the intermediate alternative under consideration in terms of impacts. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using ≥10" mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - <10". Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40am) is included for federal vessels targeting spiny dogfish in the New Jersey hotspot polygon in May. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 3 (Intermediate Package) includes the following time/area closures and gear restrictions:

<u>Vessels with a federal fishing permit targeting monkfish in federal and/or state waters</u>

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 8) during **May 1 – May 31** and **December 1 – December 31**, two months with the highest observed sturgeon takes.
- Closure in New Jersey bycatch hotspot polygon (Figure 9) during **December 1 – December 31**, the month with the highest observed sturgeon takes.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 9) in the rest of year when above polygon closure not in effect (January 1 – November 30).

<u>Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters</u>

- Closure in the New Jersey bycatch hotspot polygon (Figure 9) during **November 1 – December 31**, two months with the highest observed sturgeon takes.
- Overnight soak time prohibition from 8pm until 5am in New Jersey bycatch hotspot polygon Figure 9) during **May 1 – May 31.**
    - Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 10) during **December 1 – February 28**, three consecutive months with the highest observed sturgeon takes.

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 8. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

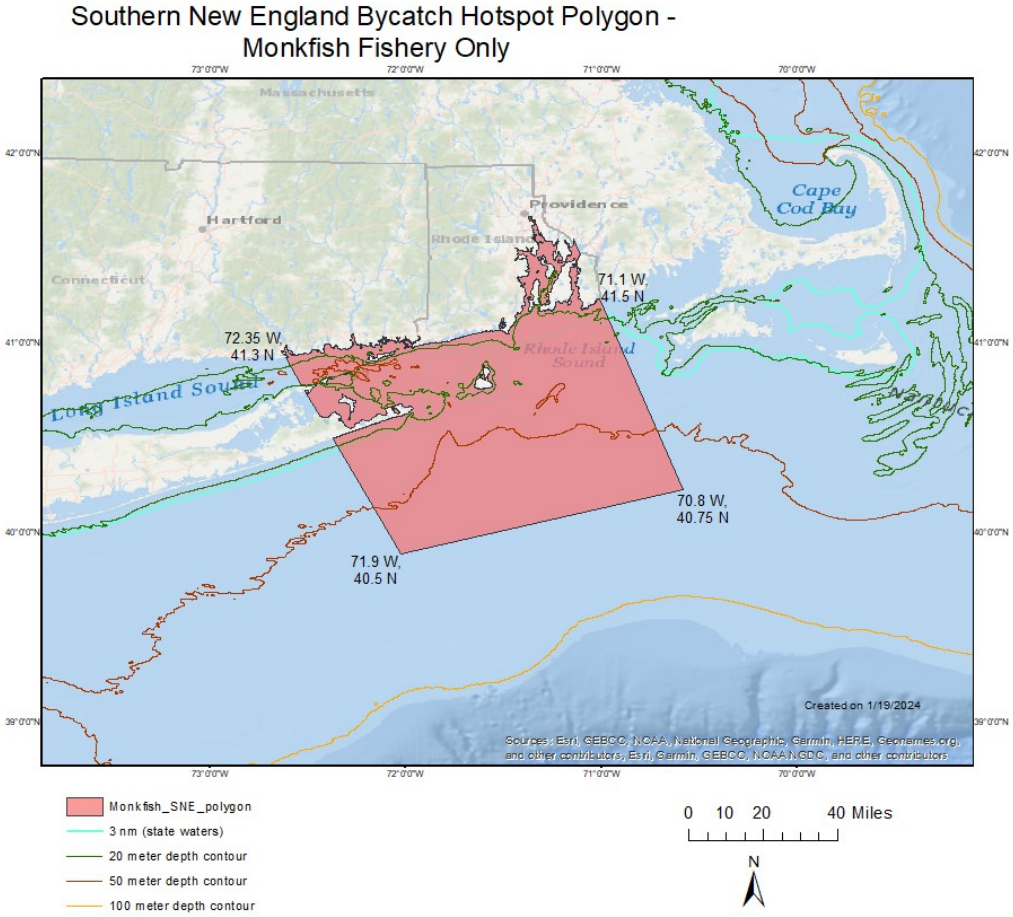


Figure 9. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

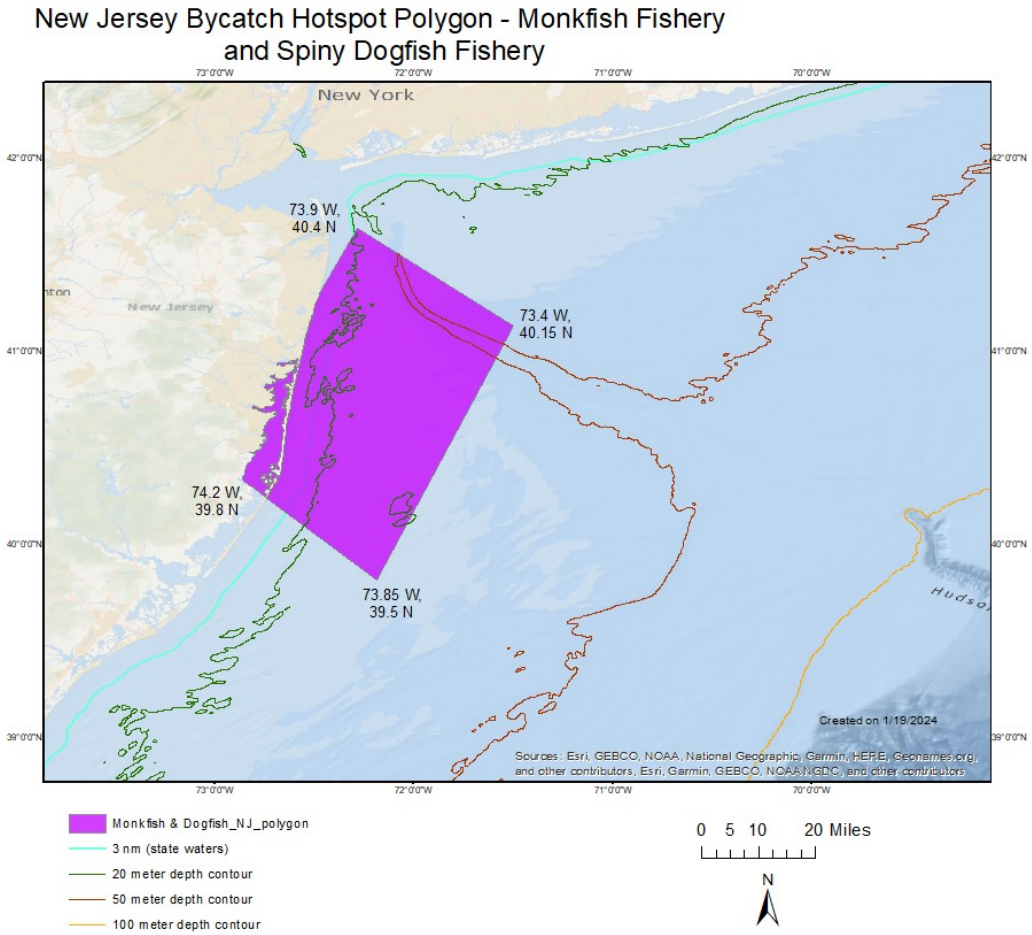
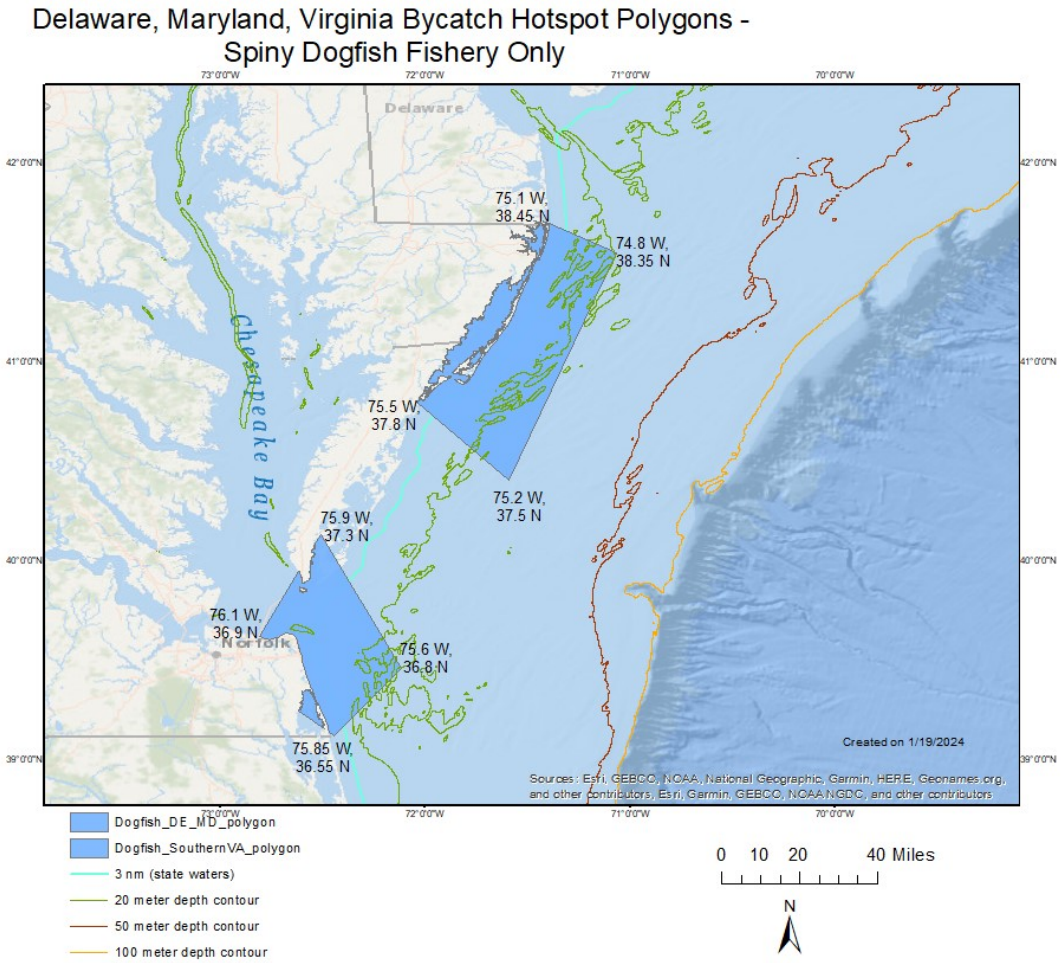


Figure 10. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would also reduce takes/mortality. This intermediate impact Alternative would have intermediate beneficial impacts for sturgeon and facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- <u>Southern New England monkfish fishery</u>
    - o May had 31 sturgeon takes from 24 vessels in the SNE polygon (unclear if these are unique vessels or not; max take for a given vessel is 3).

    - December had 33 sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.
- New Jersey monkfish fishery
    - December had 29 observed sturgeon takes in the NJ polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
- New Jersey spiny dogfish fishery
    - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
    - November through December has 29 observed sturgeon takes in the NJ polygon, representing 16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- Delaware/Maryland/Virginia spiny dogfish fishery
    - Across both polygons, December through February has 79 observed takes, representing 44% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

  Table 5 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets (≥7") in the Harbor Porpoise regulations during applicable months (January-April).

- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5" - <10" (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10" until May 1, 2025 at which time the minimum mesh size is increased to 12"): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak

time restrictions are during times of documented high sturgeon bycatch as described above for closures. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Farenheight) (Kahn and Mohead 2010). Effectively requiring vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.4 Alternative 4 – Low Impact Sturgeon Package (Least Time/Area Closures and Gear Restrictions)

Under Alternative 4, only the most targeted time/area closures and gear restrictions under consideration for both the federal monkfish and spiny dogfish gillnet fisheries would be implemented in the Atlantic sturgeon bycatch hotspot areas Figure 11, Figure 12, Figure 13). This alternative has the fewest measures, based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using ≥10" mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - <10". Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40am) is included for federal vessels targeting spiny dogfish in the New Jersey hotspot polygon in May. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 4 includes the following time/area closures and gear restrictions:

<u>Vessels with a federal fishing permit targeting monkfish in federal and/or state waters</u>

- Closure in Southern New England (SNE) bycatch hotspot polygon (Figure 11) during **December 1 – December 31**, the month with the highest observed sturgeon takes.
- Closure in New Jersey bycatch hotspot polygon (Figure 12) during **November 1 – November 30.**
  - Note, if the Councils do not select the option to require low-profile gillnet gear in the New Jersey hotspot in the month of December (month with the highest observed takes), then this closure should be in December instead of November.
- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 12) during **December 1 – December 31.**

<u>Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters</u>

- Closure in New Jersey bycatch hotspot polygon (Figure 12) during **November 1 – November 30.**
- Overnight soak time prohibition from 8pm until 5am in New Jersey bycatch hotspot polygon (Figure 12) during **December 1 – December 31** and **May 1 – May 31.**
- Closure in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 13) during **December 1 – January 31**, two consecutive months with the highest observed sturgeon takes.

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine

Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 11. Southern New England sturgeon polygon applicable only to the federal monkfish fishery.

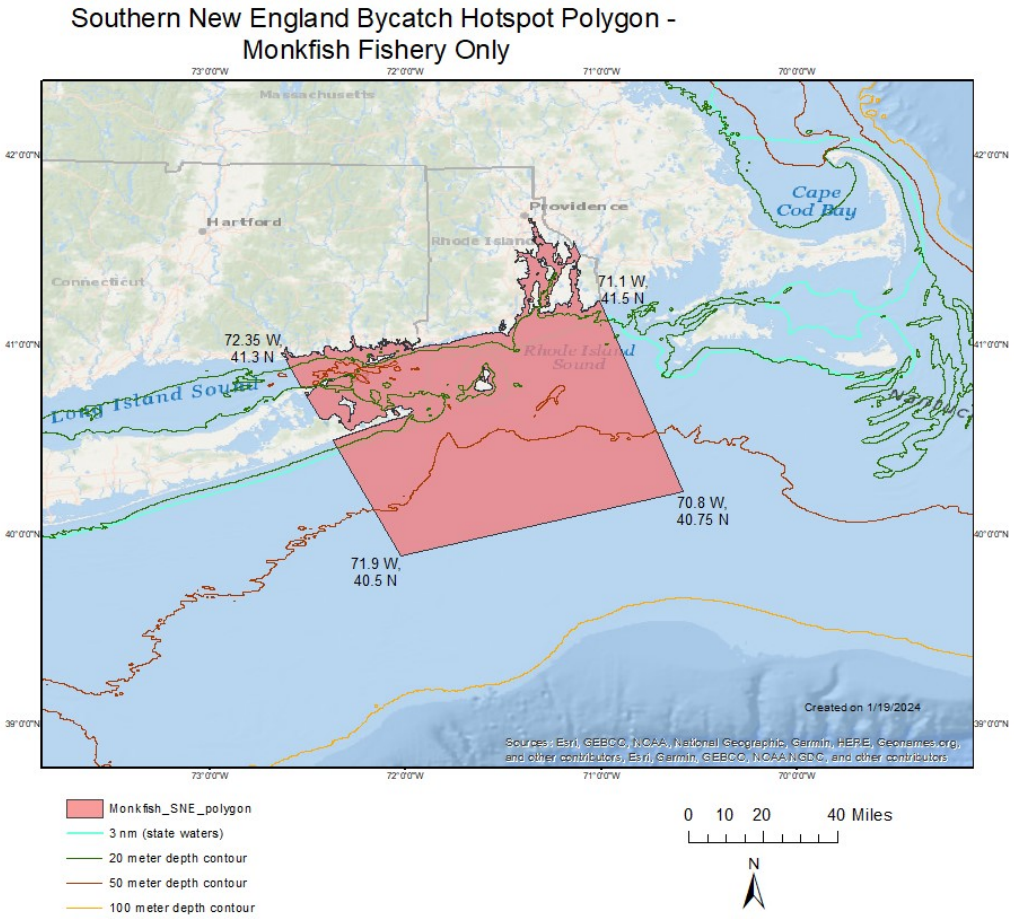


Figure 12. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

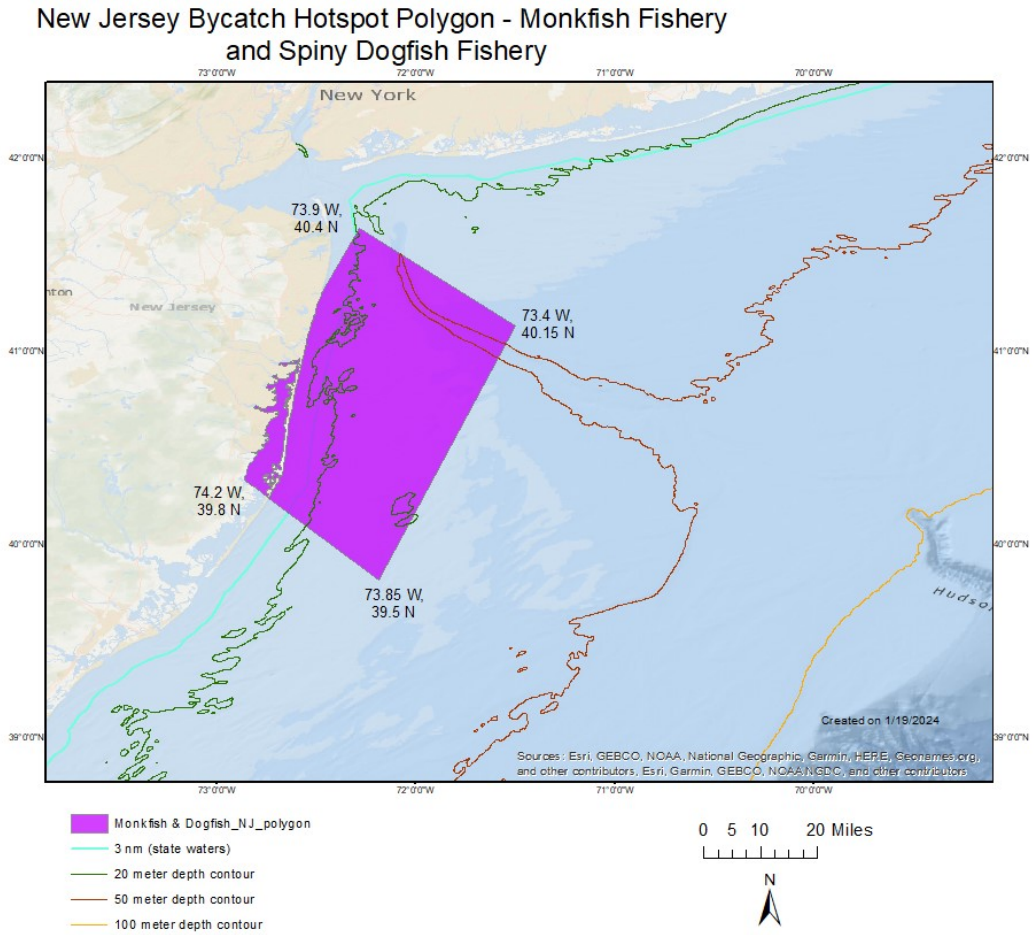
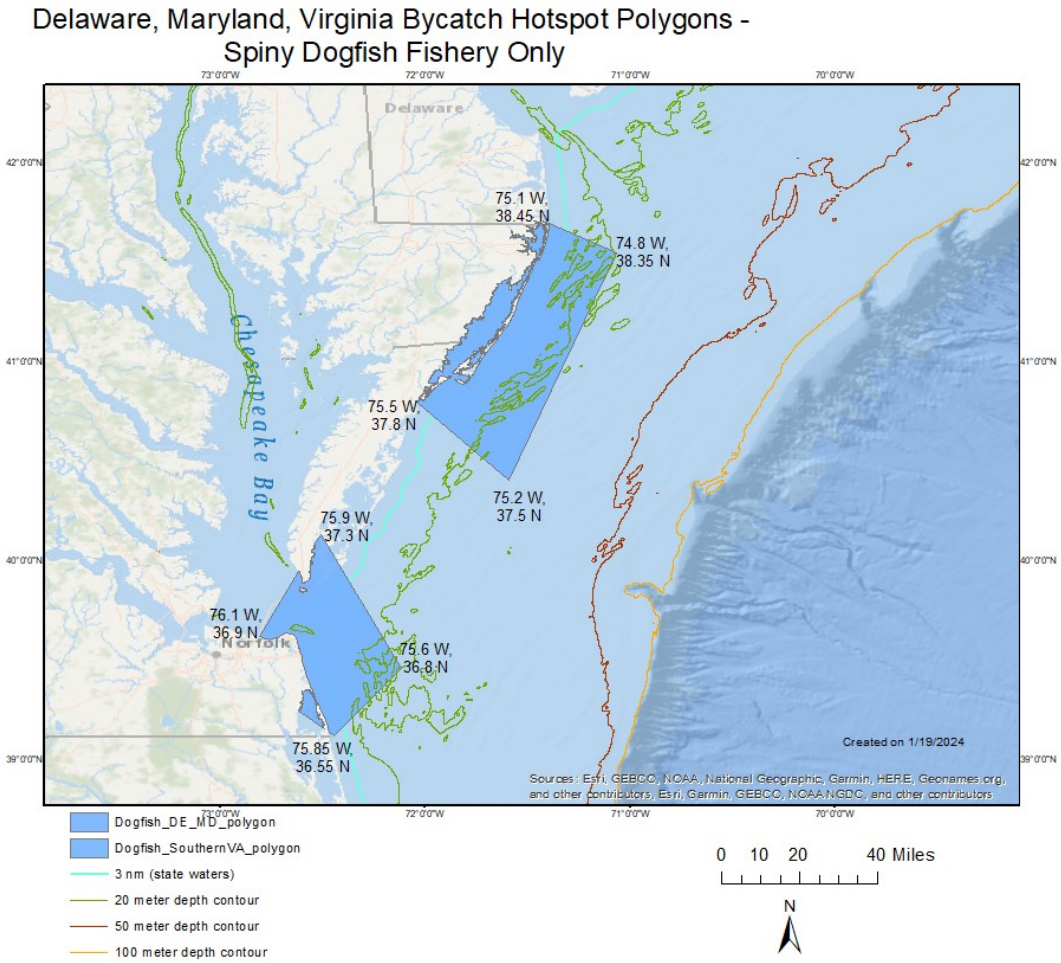


Figure 13. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time/area closures: The time-area closures would likely reduce overall gillnet fishing, thus eliminating some interactions with Atlantic sturgeon (and mortality) by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters. These hotspot area polygons and times in which measures would apply are based on observer data indicating when and where observed sturgeon takes occurred most frequently from 2017-2019 and 2021-2022. If effort shifts to areas with less sturgeon, that would also reduce both sturgeon takes and mortality. This low impact Alternative would have the least beneficial impacts for sturgeon and facilitates comparing a range of alternatives.

Rationale for specific timing of measures are included as follows for observed gillnet takes on trips targeting monkfish and spiny dogfish from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- Southern New England monkfish fishery
    - December had 33 observed sturgeon takes in the SNE polygon, representing ~19% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the SNE polygon was 3.

- New Jersey monkfish fishery
    - November did not have any sturgeon takes in the NJ polygon in the monkfish fishery, however, there were substantial observed sturgeon takes in the spiny dogfish fishery in this area during the same time period so there was interest in aligning these time/area measures for both fisheries.
    - December had 29 observed sturgeon takes in the NJ polygon, representing ~17% of total observed gillnet takes on trips targeting monkfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 3.
- New Jersey spiny dogfish fishery
    - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single haul in the NJ polygon was 5.
    - November through December has 29 observed sturgeon takes in the NJ polygon, representing 16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2. The number of sturgeon takes for each of these months cannot be shared due to data confidentiality reasons, though it is worth noting that December represents <1% of total observed gillnet takes on trips targeting spiny dogfish.
- Delaware/Maryland/Virginia spiny dogfish fishery
    - Across both polygons, December through January had 69 sturgeon, representing ~38% of observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

  Table 5 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets (≥7") in the Harbor Porpoise regulations during applicable months (January-April).

- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5" - <10" (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10" until May 1, 2025 at which time the minimum mesh size is increased to 12"): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight

is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions are during times of documented high sturgeon bycatch as described above for closures. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Farenheight) (Kahn and Mohead 2010). Effectively requiring vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.5 ALTERNATIVE 5 – GEAR-ONLY STURGEON PACKAGE

Under Alternative 5, there would be gear restrictions for both the federal monkfish and spiny dogfish gillnet fisheries in several Atlantic sturgeon bycatch hotspot areas (Figure 14 and Figure 15). This alternative has the fewest measures and is the most targeted bycatch reduction alternative under consideration based on times where observed sturgeon bycatch is the highest. The time/area closures and the gear restrictions would apply to federal gillnet fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) using ≥10" mesh size and vessels with federal spiny dogfish permits using gillnet gear with mesh size of 5 - <10". Gear restrictions include a requirement for federal vessels targeting monkfish to use low-profile gillnet gear in the New Jersey bycatch hotspot polygon to be implemented on January 1, 2026. Additionally, an overnight soak time prohibition from 8pm until 5am (sunrise in Point Pleasant NJ on May 15 is 5:40 am) is included for federal vessels targeting spiny dogfish in the New Jersey and the two Mid-Atlantic polygons. The polygons where the closures and gear restrictions would apply are the same for both the monkfish and spiny dogfish fisheries off New Jersey to help simplify the measures and to acknowledge that sturgeon are caught in this area by both fisheries. There are two Delaware/Maryland/Virginia bycatch polygons because of the two concentrations of observed sturgeon takes. The observed sturgeon takes occurred during similar times of the year, thus, the same closure and gear restriction measures would be the same across both polygons.

More specifically, Alternative 5 includes the following time/area closures and gear restrictions:

<u>Vessels with a federal fishing permit targeting monkfish in federal and/or state waters</u>

- Low-profile gillnet gear requirement in New Jersey bycatch hotspot polygon (Figure 14), **Year-round.**

<u>Vessels with a federal fishing permit targeting spiny dogfish in federal and/or state waters</u>

- Overnight soak time prohibition from 8pm until 5am in the New Jersey bycatch hotspot polygon (Figure 14) during **May 1 – May 31** and **November 1 – November 30.**
- Overnight soak time prohibition from 8pm until 5am in the Delaware/Maryland/Virginia bycatch hotspot polygons (Figure 15) during **November 1 – March 31.**

Note, time/area closures and gear restrictions would be implemented in both federal and state waters, however, the measures would only apply to vessels with a federal fishing permit. Atlantic States Marine Fisheries Commission (ASMFC) is expected to take complementary action to reduce sturgeon interactions by state vessels in state waters.

Figure 14. New Jersey sturgeon polygon applicable to both the federal monkfish and spiny dogfish fisheries.

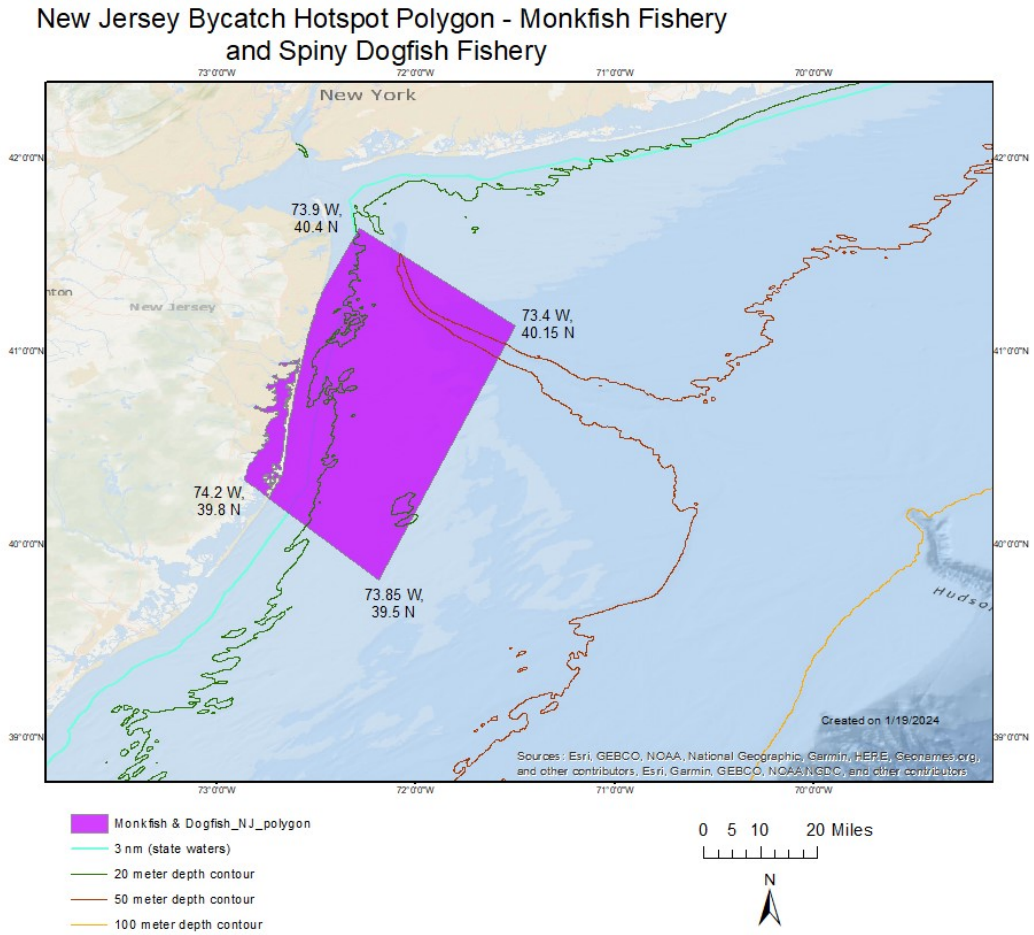
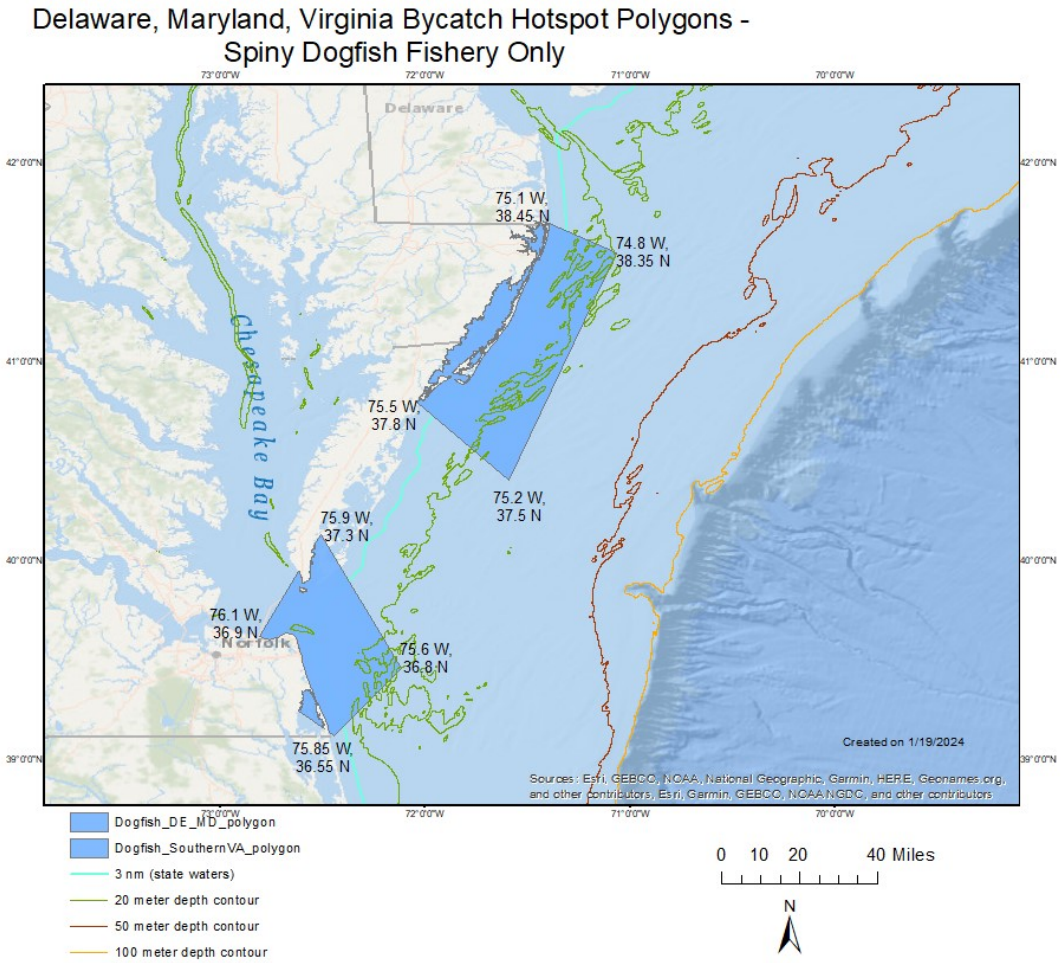


Figure 15. Delaware/Maryland/Virginia sturgeon polygon applicable to only the federal spiny dogfish fishery.



Rationale for specific time periods: The time periods in which gear restrictions would apply are based on reducing interactions with Atlantic sturgeon by federal fishing vessels targeting monkfish (e.g., vessels using a Monkfish DAS) and spiny dogfish using gillnet gear in federal and state waters in the bycatch hotspot areas. These hotspot area polygons and times in which measures would apply were based on observer data including when and where observed sturgeon takes for federal gillnet vessels targeting monkfish and spiny dogfish occurred from 2017-2019 and 2021-2022. There were 355 observed sturgeon takes for gillnet trips targeting monkfish and spiny dogfish, 175 from the monkfish fishery and 180 from the spiny dogfish fishery. See Section 4.0 for how sturgeon interactions were determined.

- <u>New Jersey spiny dogfish fishery</u>
    - May had 12 observed sturgeon takes in the NJ polygon, representing ~7% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 5.
    - November had 28 observed sturgeon takes in the NJ polygon, representing ~16% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in the NJ polygon was 2.
- <u>Delaware/Maryland/Virginia spiny dogfish fishery</u>

- Across both polygons, November through March had 107, representing ~59% of total observed gillnet takes on trips targeting spiny dogfish. The greatest number of sturgeon caught on a single observed haul in these two Mid-Atlantic polygons was 9.

Rationale for gear restriction measures:

- Low-profile gillnet gear in the monkfish fishery: Low-profile gillnet gear in the monkfish fishery has been shown to reduce sturgeon bycatch in the New Jersey region based on various studies. More specifically, in the Fox, et al. 2019 study, sturgeon bycatch was reduced by ~76% (by a ratio of 4.2 to 1) when using the experimental low-profile gillnet gear in the New Jersey region. The authors emphasize that the results are highly uncertain, however. It is also worth noting that this study also evaluated monkfish catch rates with the experimental low-profile gillnet gear and found that vessels fishing out of New Jersey had no significant difference in monkfish catch rates, however, vessels fishing out of New York caught significantly fewer monkfish. This is the reason why use of low-profile gillnet gear is only being proposed for use by the monkfish fishery in the New Jersey bycatch hotspot polygons and not other regions and not in the spiny dogfish fishery until further research is done.

  Table 5 summarizes the gear studies. See Alternative 2 for additional detail.

- Requirement of low-profile gear would be delayed until January 1, 2026 to allow sufficient time for gear manufacturers to produce this gear for the commercial monkfish vessels. The delay will also allow additional time for the Harbor Porpoise Take Reduction Team to consider changes to minimum twine size requirements in the harbor porpoise regulations to potentially allow for an exemption for the low-profile gillnet gear which would use 0.81 mm versus 0.90 mm that is currently required for large-mesh gillnets (≥7") in the Harbor Porpoise regulations during applicable months (January-April).

- Overnight soak time prohibition from 8pm until 5am in the spiny dogfish fishery, defined as vessels with a spiny dogfish permit using gillnet gear with mesh between 5" - <10" (e.g., would not apply to the monkfish fishery which has a minimum mesh size of 10" until May 1, 2025 at which time the minimum mesh size is increased to 12"): Soak time limits may be feasible for the spiny dogfish fishery, which may vary by fisherman and region. Restricting soak times overnight is more enforceable compared to limiting spiny dogfish fishing to 24 hours or greater. The soak time restrictions reduce takes by reducing the time gear is in the water and should also reduce mortality, which increases when gear is unchecked for more than 14 hours at 15 degrees Celsius (59 Farenheight) (Kahn and Mohead 2010). Forcing vessels to remove gear each day could have vessel safety issues in times of severe weather.

4.6 ALTERNATIVES CONSIDERED BUT REJECTED

4.6.1 Adding an option to use Vessel Monitoring System (VMS)

The Councils considered using VMS as an enforcement / management tool as part of the range of the monkfish and spiny dogfish alternatives to make soak time restrictions and area closures more enforceable. Currently, VMS is not a requirement in the monkfish and spiny dogfish fisheries, however, this was discussed during Framework 13 development for the monkfish fishery in 2022. During the Joint Monkfish and Dogfish Committee meeting, invited enforcement representatives clarified that VMS is not required to enforce time/area closures, though is still helpful to identify the fishery declaration and vessel location. The Coast Guard uses routine patrols in aircraft and cutters and can do targeted boardings if there are known restrictions in the area regardless of whether a vessel has VMS or not. There was general concern for the impacts of any VMS requirement for these fisheries given the added cost, quota reductions, processor limitations, etc. As part of its priority list for work to be potentially done in 2024, the NEFMC decided instead to add "review of the utility of VMS and how it is used for enforcement in coordination with the MAFMC" given the broader implications for requiring VMS in other fisheries beyond monkfish and spiny dogfish.

4.6.2 Soak time restrictions of 24 hours or greater in the monkfish and spiny dogfish fisheries

The Councils considered restricting soak time limits of 24 hours or greater for the monkfish and spiny dogfish fisheries, however, the options were removed from further consideration given these restrictions do not necessarily reduce sturgeon interactions/bycatch and there are enforcement concerns.

4.6.3 Soak time and low-profile gear restrictions and closures by entire statistical area approach

The Councils considered applying gear restrictions (soak time limits and low-profile gillnet gear) and closures by entire statistical area, however, these are broad areas that are well outside of sturgeon bycatch hotpots and are likely to cause substantial impacts to fishermen.

4.6.4 Shorter increments of time/area closures and additional partial-year gear restriction time periods

Shorter, weekly increments of time/area closures and additional partial-year gear restriction time periods were considered to allow for various combinations of shorter time periods across areas and fisheries, but after initial analysis, these measures were ultimately removed from further consideration. This is because these shorter temporal measures were not likely to achieve the sturgeon bycatch reduction targets identified by GARFO's Protected Resource Division in a December 4, 2023 memo addressed to the Sturgeon Bycatch FMAT/PDT. Furthermore, the available data did not support an analysis to that level of temporal and spatial resolution without confidentiality issues. The refined range of alternatives in Section 4.0 is a more simplified version that captures the full range of possible time/area closures and gear restriction measures.

5.0 DRAFT AFFECTED ENVIRONMENT

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

5.1 TARGET SPECIES

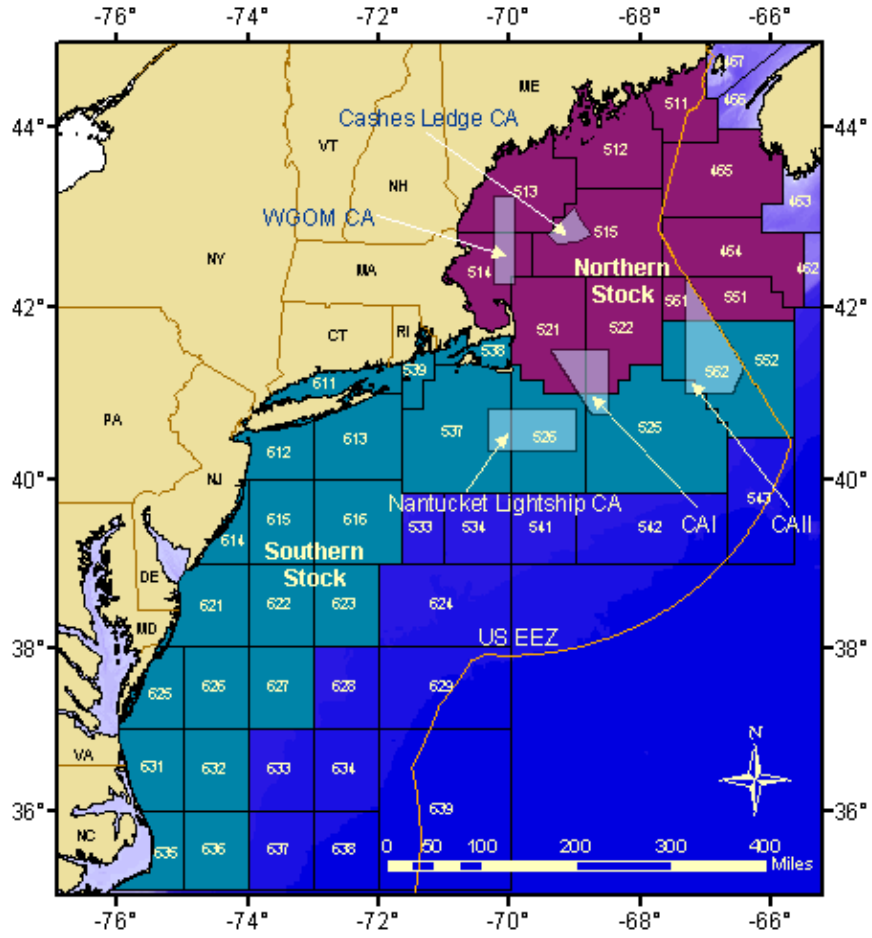
MONKFISH

Monkfish Management: The monkfish fishery in U.S. waters is jointly managed under the Monkfish Fishery Management Plan (FMP) by the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC), with the NEFMC having the administrative lead. The fishery extends from Maine to North Carolina out to the continental shelf margin. The fishery is assessed and managed in two areas, northern and southern (Map 1). The Northern Fishery Management Area (NFMA) covers the Gulf of Maine (GOM) and northern part of Georges Bank (GB), and the Southern Fishery Management Area (SFMA) extends from the southern flank of GB through the Mid-Atlantic Bight to North Carolina. The directed monkfish fishery is primarily managed with a yearly allocation of monkfish Days-at-Sea (DAS) and possession limits, though incidental landings are allowed in other fisheries.

Monkfish Distribution and Life History. Monkfish (*Lophius americanus*), also called goosefish, occur in the Northwest Atlantic Ocean from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina (Collette & Klein-MacPhee 2002). Data from resource surveys spanning the period 1948-2007 suggest that seasonal onshore-offshore migrations occur (from inshore areas in autumn to depths of at least 900 m in mid-spring) and appear to be related to spawning and possibly food availability (Richards *et al.* 2008). Stock structure is not well understood, but two assessment and management areas for monkfish, northern and southern, were defined in 1999 through the original Fishery Management Plan based on patterns of recruitment and growth and differences in how the fisheries are prosecuted (NEFSC 2020b).

Map 1. Fishery statistical areas used to define the Monkfish NFMA and SFMA.

Source: NEFSC (2020b).



Monkfish Stock Status. The status of the monkfish stocks changed in 2023 to unknown from not subject to overfishing and not overfished, based on the 2022 monkfish stock assessment. These changes were made because the 2013 assessment that supported the prior stock status determinations were rejected during the 2016 assessment due to an invalid ageing method. Analytical assessments have not been used for monkfish since 2013, and index-based approaches have been used since to determine catch advice. A brief history of recent assessments is provided.

The monkfish stock assessment in 2010 (SARC 50) was an analytical assessment that used the SCALE model (had been in use since 2007), concluding that monkfish was not overfished and overfishing was not occurring but recognized significant uncertainty in this determination. The 2013 operational assessment also used the SCALE model and reached the same conclusion.

The 2016 operational assessment, that informed FY 2017-2019 specifications, did not update the SCALE model because its use was invalidated by age validation research (Richards 2016). This assessment concluded that many of the biological reference points were no longer relevant due to invalidation of the growth model (e.g., no estimation of absolute biomass, F_{max} could not be recalculated), and thus were not updated. Stock status was concluded to be unknown. A strong 2015-year class was identified in both the survey and the discard data. The assessment review panel concluded that using a survey index-based method for developing catch advice was appropriate. A method now called the "Ismooth" approach was used that set catch advice based on the recent trend in NEFSC trawl survey indices. This method

calculates the proportional rate of change in a smoothed average of the fall and spring NEFSC surveys over the most recent three years. This rate is the slope of the regression trend from the last three years, which is then multiplied by the most recent three years average of fishery catch to determine catch advice. The multipliers were 1.02 in the NFMA and 0.87 in the SFMA (Table 6):

*Equation 1: catch advice = Trawl survey multiplier * latest 3-year average catch = ABC*

The 2019 assessment continued use of the Ismooth method due to ongoing uncertainties. The assessment continued to see a strong recruitment event from 2015 that led to an increase in biomass in 2016-2018, though abundance declined in 2019 as recruitment returned to average levels (NEFSC 2020b). The Ismooth multipliers were 1.2 in the NFMA and 1.0 in the SFMA.

Table 4. NEFSC trawl survey multipliers for monkfish from the last three assessments.

Assessment year	NEFSC trawl survey multiplier	
	NFMA	SFMA
2016	1.02	0.87
2019	1.2	1.0
2022	0.829	0.646
Source: Richards (2016); NEFSC (2020b); Deroba (2022).		

The 2022 management track assessment again used the Ismooth method to develop catch advice. Like the 2016 and 2019 assessments, this assessment concluded that the status of monkfish remains unknown. The multipliers were 0.829 for NFMA and 0.646 for SFMA, tracking the decline in monkfish biomass in the NEFSC trawl surveys. The fishery catch time series was updated, including a new discard mortality rate for scallop dredges (reduced to 64% from 100%) and various data corrections (Deroba 2022).

The October 19, 2022 Monkfish PDT memo to the SSC on OFLs and ABCs details how these prior assessments were used in setting specifications.

SPINY DOGFISH

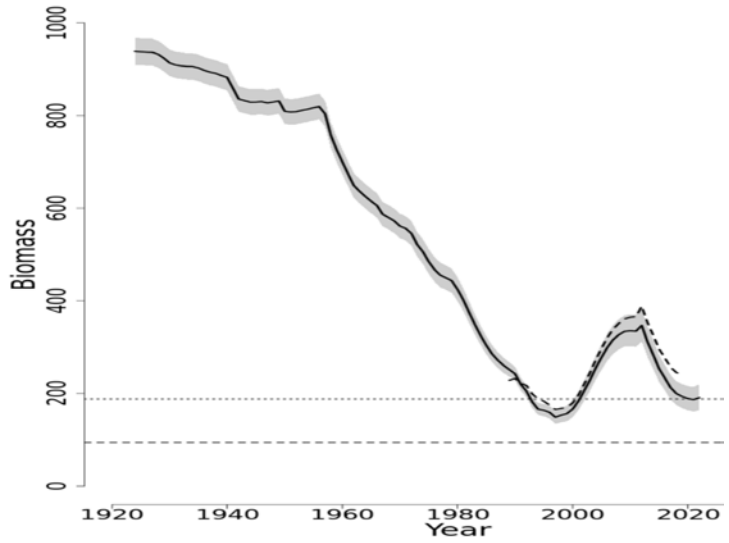
Spiny dogfish Management: The spiny dogfish fishery in U.S. waters is jointly managed under the Spiny dogfish Fishery Management Plan (FMP) by the Mid-Atlantic Fishery Management Council (MAFMC) and the New England Fishery Management Council (NEFMC), with the MAFMC having the administrative lead. The management unit area incudes all U.S. east coast water. Canadian landings are also accounted for as part of setting annual specifications (the assessment integrates Canadian catch data).

Life History: Spiny dogfish (*Squalus acanthias*) is a long-lived (up to 50 years) schooling shark that is widely distributed across both sides of the North Atlantic. The Northwest Atlantic population is treated as one stock – substantial migration is not believed to occur across the two sides of the Atlantic (though tagging studies do find occasional long-distance migrators (e.g. Hjertenes 1980, Templeman 1954). Spiny dogfish are considered one of the most migratory shark species in the northwest Atlantic (Compagno 1984). In the northwest Atlantic, spiny dogfish occur from Florida to Canada, with highest concentrations from Cape Hatteras to Nova Scotia. In the winter and spring, they are found primarily in Mid-Atlantic waters, and tend to migrate north in the summer and fall, with concentrations in southern New England, Georges Bank, and the Gulf of Maine (though a recent study has created some uncertainty regarding the established migration paradigm, Carlson 2014). Spiny dogfish have a wide-ranging diet consisting of fish, such as herring, mackerel and sand lance, as well as invertebrates including ctenophores, squid, crustaceans and bivalves. Spiny dogfish are live bearers with a very long gestation period (18-24 months), and are slow growing with late maturation. These reproductive characteristics generally make a stock more vulnerable to overfishing (https://www.fisheries.noaa.gov/international-

affairs/shark-conservation, NOAA 2001). Females grow larger than males and as a result, the fishery primarily targets females.

Spiny Dogfish Stock Status: Based on the 2023 Spiny Dogfish MTA, which used the Stock Synthesis 3 (SS3) assessment model and passed peer review in 2023, the spiny dogfish stock was neither overfished nor experiencing overfishing in 2022[3]. Biomass (spawning output) in 2022 was estimated to be at 101% of the reference point/target, despite being relatively near its all-time low. Fishing mortality in 2022 was 81% of the overfishing threshold (the first time in the last decade without overfishing). Biomass and fishing mortality figures are immediately below. Due to the stock's reduced productivity, the SS3 model projections predict that relatively low future catches are needed to stay at the target (NEFSC 2023).

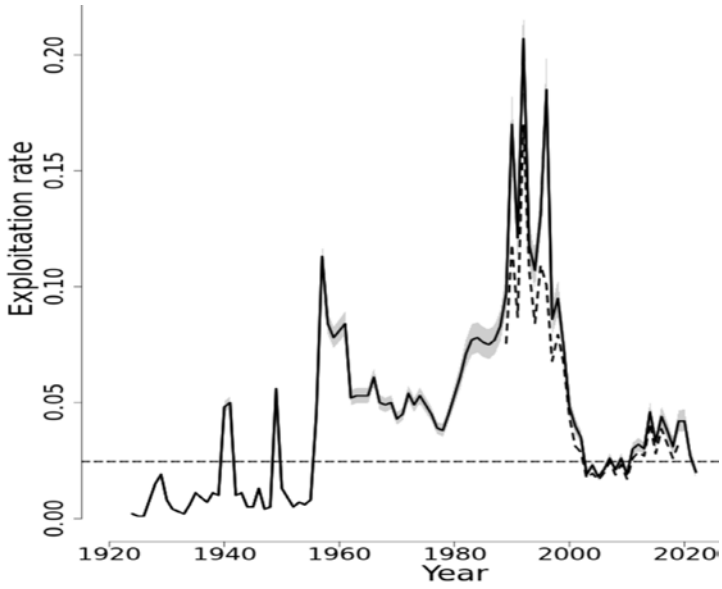
Figure 16. Time series of spawning output 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold.



Source: 2023 Spiny Dogfish Management Track Assessment, available at https://www.mafmc.org/ssc-meetings/october-30-2023

[3] The assessment and its peer review summary are available at https://www.mafmc.org/ssc-meetings/october-30-2023.

Figure 17. Time series of fishing mortality 1924-2022 from the accepted SS3 model with reference points (top horizontal dotted line is the target, lower dashed horizontal line is the overfished threshold.



Source: 2023 Spiny Dogfish Management Track Assessment, available at https://www.mafmc.org/ssc-meetings/october-30-2023

5.2 NON-TARGET SPECIES

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery with Non-Target species, so Section 5.2 (monkfish focus) and 5.3 (spiny dogfish focus) differ somewhat in formatting.

MONKFISH FOCUS

The monkfish fishery is closely associated with several fisheries managed by other FMPs, specifically the groundfish, skate, spiny dogfish, and scallop fisheries. Particularly in the NFMA, monkfish can be targeted or caught as incidental bycatch during trips in which groundfish are also caught, depending on the focus of a trip. Monkfish are caught as bycatch in the scallop fishery, particularly in the SFMA. Further, skates and spiny dogfish are often caught when targeting monkfish in both areas, but particularly in the SFMA.

5.2.1 Northeast Multispecies

Life History and Population. The Northeast Multispecies FMP manages 20 groundfish stocks and stock status varies by stock (NEFMC 2022a).

In U.S. waters, cod are currently managed as two stocks: Gulf of Maine (GOM) and Georges Bank (GB). Based on the updated assessment, the GOM cod stock is overfished and overfishing is occurring for the M=0.2 model and overfished and overfishing is not occurring for the M-ramp model. Georges Bank cod,

Gadus morhua, is the most southerly cod stock in the world. Based on the 2021 assessment, overfishing status is considered unknown and stock status remains overfished based on a qualitative evaluation of poor stock condition (NEFSC 2022). Recent work by the Atlantic Cod Stock Structure Working Group proposes a new stock structure with five biological stocks in U.S. waters: Georges Bank, Southern New England, Western Gulf of Maine and Cape Cod winter spawners, Western Gulf of Maine spring spawners, and Eastern Gulf of Maine (McBride & Smedbol 2022). The Western Gulf of Maine spring spawners overlaps spatially with the Western Gulf of Maine and Cape Cod winter spawner stock. The Council is working on a transition plan for management of the current two stocks to up to five stocks and the research track working group is currently working to determine how these stocks will be assessed, tentatively scheduled for 2023.

Six distinct haddock stocks have been identified, and the two which occur in U.S. waters are associated with Georges Bank and the Gulf of Maine. As of its 2022 assessment, GOM haddock is not overfished but overfishing is occurring; the 2021 SSB was estimated to be at 16,528 mt, which is 270% of the biomass target (NEFSC 2022 in prep). GB haddock is not overfished and overfishing is not occurring; the 2021 SSB was estimated to be 79,513 mt, which is 66% of the biomass target (NEFSC 2020b).

Off the U.S. coast, American plaice are managed as a single stock in the Gulf of Maine and Georges Bank regions. In the Gulf of Maine and Georges Bank, the American plaice is not overfished and overfishing is not occurring. The stock was in a rebuilding plan, but based on the 2019 assessment, the stock is now considered rebuilt (NEFSC 2020b).

Witch flounder is managed as a unit stock. Because a stock assessment model framework is lacking, no historical estimates of biomass, fishing mortality rate, or recruitment can be calculated. NMFS determined that the stock status for witch flounder will remain overfished, with overfishing unknown, consistent with the 2016 benchmark assessment for this stock.

Winter flounder is managed and assessed in U.S. waters as three stocks: Gulf of Maine, southern New England/Mid-Atlantic, and Georges Bank. Based on the recommendation of the 2020 Peer Review Panel, overfishing is not occurring for GOM winter flounder, but the overfished status is unknown; GB winter flounder is overfished and overfishing is not occurring; SNE/MA winter flounder is overfished, but overfishing is not occurring (NEFSC 2020).

NMFS manages three yellowtail stocks off the U.S. coast including the CC/GOM, GB, and SNE/MA stocks. Based on the 2019 operational assessment, the CC/GOM yellowtail flounder stock is not overfished and overfishing is not occurring. GB yellowtail flounder status determination relative to reference points is not possible because reference points cannot be defined; 2020 stock assessment results continue to indicate low stock biomass and poor productivity. Based on the 2019 operational assessment, the SNE/MA yellowtail flounder stock is overfished and overfishing is not occurring (NEFSC 2020b).

NMFS manages Acadian redfish inhabiting the U.S. waters of the Gulf of Maine and deeper portions of Georges Bank and the Great South Channel as a unit stock. Based on the recommendation of the 2020 Peer Review Panel, redfish is not overfished and overfishing is not occurring. Redfish is rebuilt.

Pollock are assessed as a single unit, though there is considerable movement of pollock between the Scotian Shelf, Georges Bank, and the Gulf of Maine. Based on the 2019 operational assessment, the pollock stock is not overfished and overfishing is not occurring.

White hake is common on muddy bottom throughout the Gulf of Maine. Based on the 2019 operational assessment, the white hake stock is overfished and overfishing is not occurring.

Windowpane flounders are assessed and managed as two stocks: Gulf of Maine-Georges Bank (GOM/GB or northern) and Southern New England-Mid-Atlantic Bight (SNE/MA or southern) due to differences in growth rates, size at maturity, and relative abundance trends. Based on the recommendations of the 2020 Peer Review Panel, northern windowpane flounder stock status is unknown; Southern windowpane

flounder is not overfished and overfishing is not occurring (status has not changed from the 2018 assessment) (NEFSC 2020b).

In US waters, ocean pout are assessed and managed as a unit stock from the Gulf of Maine to Delaware. Based on the 2020 assessment, ocean pout is overfished but overfishing is not occurring. The stock is not rebuilding as expected, despite low catch. Discards comprise most of the catch since the no possession regulation was implemented in May 2010.

Atlantic halibut is the largest species of flatfish and is distributed from Labrador to southern New England. Halibut is assessed using a data-poor method (First Second Derivative model), and projections are not possible using this method. Biological reference points are unknown for halibut, but the stock is considered overfished. Halibut is currently in a rebuilding plan with an end date of 2056.

Atlantic wolffish is a benthic fish distributed off Greenland to Cape Cod and sometimes in southern New England and New Jersey waters. Based on the recommendations of the 2020 Peer Review Panel, wolffish is overfished but overfishing is not occurring. Wolffish is in a rebuilding plan, but the end date is not defined.

Management and Fishery. Northeast multispecies are managed under a dual management system which breaks the fishery into two components: sectors and the common pool. For stocks that permit fishing, each sector is allotted a share of each stock's ACL that consists of the sum of individual sector member's potential sector contribution based on their annual catch entitlements. Sector allocations are strictly controlled as hard total allowable catch limits and retention is required for all stocks managed under an ACL. Overages are subject to accountability measures including payback from the sector's allocation for the following year. Common pool vessels are allocated days at sea (DAS) and their effort further is controlled by a variety of measures including trip limits, closed areas, minimum fish size and gear restrictions varying between stocks. Only a very small portion of the ACL is allotted to the common pool. Framework Adjustment 63 to the NE Multispecies FMP has more detail on the stock status and control of fishing effort (NEFMC 2022a).

5.2.2 Skates

Life History and Population. The Northeast Skate Complex Fishery Management Plan (Skate FMP) specifies the management measures for seven skate species (barndoor, clearnose, little, rosette, smooth, thorny, and winter skate) off the New England and Mid-Atlantic coasts. Specifications are set for skates as a complex (e.g., one ACL) every two years, which include possession limits for the skate wing and bait fisheries. These fisheries have different seasonal management structures and are subject to effort controls and accountability measures. Overfishing is not occurring on any of these species, and only one species, thorny skate, is overfished.

Management and Fishery. A detailed description of the commercial skate fishery and fishing communities may be found in Framework Adjustment 8 (NEFMC 2020b). The bait fishery is primarily whole little and small-winter skates, and the wing fishery is primarily large-winter and barndoor skates. There are three primary skate ports: Chatham and New Bedford, Massachusetts and Point Judith, Rhode Island; and 11 secondary ports from Massachusetts to New Jersey. The number of vessels landing skate has declined since FY 2011 (567) to 322 in FY 2020. Skate revenue has fluctuated between $5.2-$9.4M annually from FY 2010 to 2020, largely due to changes in wing revenue. Within the directed monkfish gillnet fishery, there is also a seasonal gillnet incidental skate fishery, in which mostly winter skates are sold for lobster bait and as cut wings for processing.

5.2.3 Atlantic Sea Scallops

Life History and Population. Sea scallops, *Placopecten magellanicus*, are distributed in the northwest Atlantic Ocean from Newfoundland to North Carolina, mainly on sand and gravel sediments where bottom temperatures remain below 20º C (68º F). North of Cape Cod, concentrations generally occur in shallow water <40 m (22 fathoms) deep. South of Cape Cod and on Georges Bank, sea scallops typically occur at depths of 25 - 200 m (14 - 110 fathoms), with commercial concentrations generally 35 - 100 m (19 - 55 fathoms). Sea scallops are filter feeders, feeding primarily on phytoplankton, but also on microzooplankton and detritus (Hart & Chute 2004). Sea scallops grow rapidly during the first several years of life. Between ages 3 and 5, they commonly increase 50 - 80% in shell height and quadruple their meat weight. Sea scallops can live more than 20 years. They usually become sexually mature at age 2, but individuals younger than age 4 probably contribute little to total egg production. Sexes are separate and fertilization is external. Spawning usually occurs in late summer and early autumn; spring spawning may also occur, especially in the Mid-Atlantic Bight. Sea scallops are highly fecund; a single large female can release hundreds of millions of eggs annually. Larvae remain in the water column for four to seven weeks before settling to the bottom. Sea scallops attain commercial size at about four to five years old, though historically, three-year-olds were often exploited. Sea scallops have a somewhat uncommon combination of life-history attributes: low mobility, rapid growth, and low natural mortality (NEFSC 2011).

Management and Fishery. The commercial fishery for sea scallops is conducted year-round, primarily using New Bedford style and turtle deflector scallop dredges. A small percentage of the fishery uses otter trawls, mostly in the Mid-Atlantic. The principal U.S. commercial fisheries are in the Mid-Atlantic (from Virginia to Long Island, New York) and on Georges Bank and neighboring areas, such as the Great South Channel and Nantucket Shoals. There is also a small, primarily inshore fishery for sea scallops in the Gulf of Maine. The NEFMC established the Scallop FMP in 1982. The scallop resource was last assessed in 2020, and it was not overfished, and overfishing was not occurring (NEFSC 2020a). Vessels targeting scallops catch monkfish and land them if the price is high enough.

SPINY DOGFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery with non-Target species, so Section 5.2 (monkfish focus) and 5.3 (spiny dogfish focus) differ somewhat in formatting.

Non-Target Species

A) Other Species Caught in Directed Spiny Dogfish Fishing

Due to reduced observer coverage in 2020 and 2021 due to Covid-19, observer data from 2017-2019 still best describe incidental catch in the spiny dogfish fishery. The primary database used to assess discarding is the NMFS Observer Program database, which includes data from trips that had trained observers onboard to document discards. One critical aspect of using this database to describe discards is to correctly define the trips that constitute a given directed fishery. A flexible criteria of what captains initially intend to target, how they may adjust targeting over the course of a trip, and what they actually catch would be ideal but is impracticable.

From 2017-2019, gill net gear accounted for 66%-74% of annual landings. Bottom long line gear accounted for 18-27% of annual landings. All other gears, including bottom trawl, accounted for only 7-8% of annual landings and are not expected to have involved substantial targeting of spiny dogfish given current trip limits (substantial trawling for spiny dogfish would only be expected at higher trip limits given the price of spiny dogfish) and very similar intensity of bottom trawling in the region would be expected to occur even with a complete prohibition on spiny dogfish retention.

From 2017-2019 there were on average 235 observed sink gill net trips (gear # = 100) annually where spiny dogfish accounted for at least 40% of retained catch, and those trips form the basis of the following analysis to determine which other species the directed spiny dogfish fishery interacts with. These trips made 2,540 hauls of which 86% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc. These observed hauls had a 5% discard rate, most of which was spiny dogfish.

The other species to exceed 1,000 pounds of observed catch per year (used as an ad-hoc minimum indication threshold of potentially more than negligible catch) included (annual observed catch rounded to nearest 1,000 pounds): winter/big skate (83,000 pounds), little skate (8,000 pounds), unknown skates (7,000 pounds), monkfish (6,000 pounds), smooth dogfish (4,000 pounds), cod (3,000 pounds), lobster (3,000 pounds), pollock (3,000 pounds), menhaden (2,000 pounds), haddock (1,000 pounds), and striped bass (1,000 pounds). Of these, only cod is overfished while the Southern New England lobster stock is "depleted with poor prospects of recovery" (https://media.fisheries.noaa.gov/2022-05/2021_SOS_FSSI_and_nonFSSI_Stock_Status_Tables.pdf, http://www.asmfc.org/species/american-lobster).

From 2017-2019 there were on average 36 observed bottom longline trips (gear # = 010) annually where spiny dogfish accounted for at least 40% of retained catch, and those trips form the basis of the following analysis to determine which other species the directed spiny dogfish fishery interacts with. These trips made 438 hauls of which 99% were observed. Hauls may be unobserved for a variety of reasons, for example transfer to another vessel without an observer, observer not on station, haul slipped (dumped) in the water before observing, etc. These observed hauls had a 10% discard rate, most of which was spiny dogfish.

The other species to exceed 1,000 pounds of observed catch per year (used as an ad-hoc minimum indication threshold of potentially more than negligible catch) included (annual observed catch rounded to nearest 1,000 pounds): golden tilefish (7,000 pounds), barndoor skate (4,000 pounds), smooth dogfish (3,000 pounds), and winter/big skate (2,000 pounds). Of these, none is overfished (https://media.fisheries.noaa.gov/2022-05/2021_SOS_FSSI_and_nonFSSI_Stock_Status_Tables.pdf).

While not extrapolations, the above amounts appear very small relative to annual catch limits for these species, and management of these species already accounts for both landings and discards. Given the apparent low level of interactions with non-target species and ongoing management of those species, their conditions are affected predominantly by other fisheries/issues and should not be affected by this action or the operation of the spiny dogfish fishery more generally.

B. Other Managed Fisheries with Non-directed Spiny Dogfish Catch

Per NMFS' 2020 report on Discard Estimation, Precision, and Sample Size Analyses for 14 Federally Managed Species Groups in the Waters off the Northeastern United States (NMFS 2020), a wide variety of gear types discard spiny dogfish beyond the gear types mentioned above that are responsible for most landings. These other gear types catch most of the species that exist in the region, some of which are in good condition and some of which are in an overfished condition. While this indicates that incidental spiny dogfish catch occurs across a wide variety of other managed fisheries, outside of the directed spiny dogfish fishery, spiny dogfish is often seen as a pest species (e.g. see MAFMC 2017 MSB Fishery Performance Report at http://www.mafmc.org/s/2017-MSB-Fishery-Performance-Report.pdf), and is often entirely discarded (e.g. longfin squid fishery – see MAFMC 2020). As such, changes in spiny dogfish regulations are not expected to change fishing patterns for other fisheries that catch (and mostly discard) spiny dogfish, or affect any of those managed species in a meaningful way. Further details about

the many other managed species in the region and their current stock statuses can be found in their relevant FMPs.

5.3 PROTECTED RESOURCES

5.3.1 Atlantic Sturgeon

The life history traits of Atlantic sturgeon have been documented in historical and contemporary literature (e.g., Dees 1961; Vladykov and Greeley 1963; ASSRT 2007; Hilton et al. 2016; ASMFC 2017). Key characteristics include that spawning occurs in freshwater of a river that is part of an estuary. The early life stages are dependent on and remain in the natal estuary for months to years until they are suitably developed to enter the Atlantic Ocean, thus beginning their seasonal use of both estuarine and marine waters for the remainder of their life. They return to a freshwater tidal reach of a river estuary when they are ready to spawn. Tagging records and the relatively low rate of gene flow reported in population genetic studies provide evidence that Atlantic sturgeon typically return to their natal river to spawn (ASSRT 2007). Adults are long-lived and spawn multiple times within their lifespan but maturity occurs relatively late, anywhere from several years to more than 20 years (ASSRT 2007; Hilton et al. 2016). The age at which they mature and the time of year when they spawn varies among the river populations.

The marine and estuarine range of all five Atlantic sturgeon DPSs as well as the two Canadian populations overlap and extends from Canada through Cape Canaveral, Florida (ASSRT 2007, Wirgin et al. 2015; Kazyak et al. 2021). In the marine environment, Atlantic sturgeon primarily occur inshore of the 50 m depth contour, but can occur in deeper waters (Stein et al. 2004a; Dunton et al. 2010). Seasonal differences in distribution with a presence in more nearshore waters in the spring, particularly near coastal estuaries, and movement to more offshore waters in the fall have been associated with several environmental variables (e.g., water temperature) and proximity to the sturgeon's natal river where the fish generally occur throughout the winter (Erickson et al. 2011; Ingram et al. 2019; Breece et al. 2018a; Breece et al. 2018b; Rothermel et al. 2020; Kazyak et al. 2021).

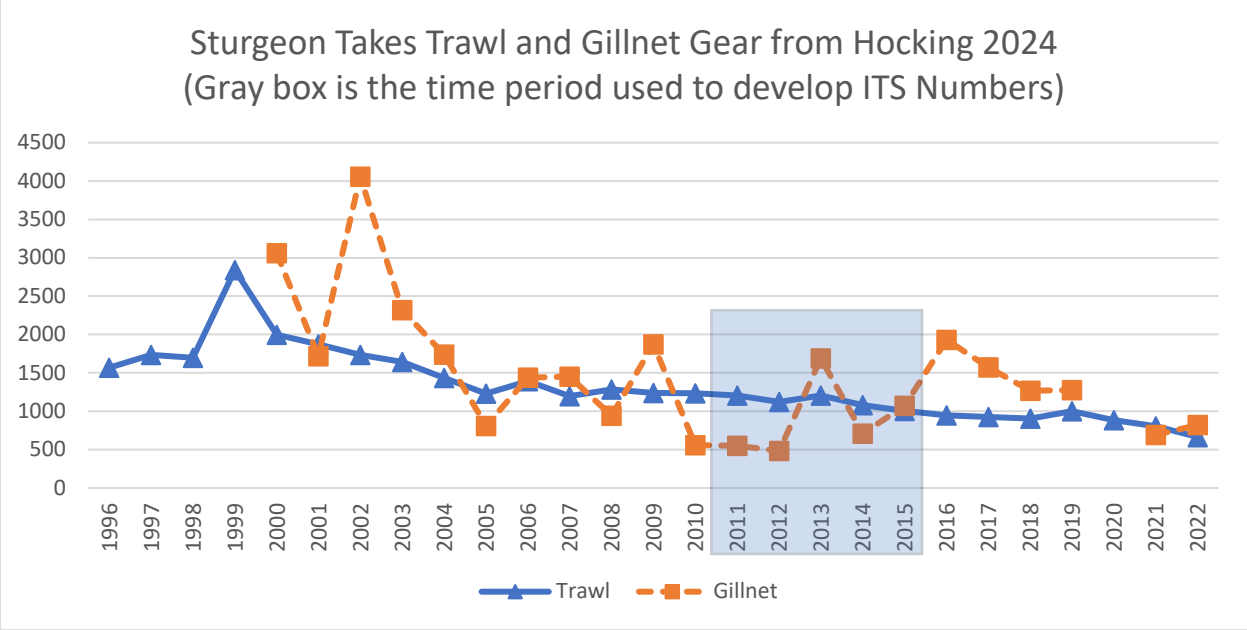
All of the Atlantic sturgeon DPSs are either at risk of extinction (i.e., those DPSs listed as endangered) or at risk of becoming endangered (i.e., the Gulf of Maine DPS) due to multiple threats that include the loss and alteration of habitat, and anthropogenic mortality. In particular, based on estimates of Atlantic sturgeon bycatch (Stein et al. 2004b; ASMFC 2007), NOAA Fisheries concluded that bycatch of Atlantic sturgeon in commercial gillnet and bottom trawl fisheries was a threat (77 FR 5880 and 77 FR 5914; February 6, 2012). NOAA Fisheries also noted in the listing determinations that there were no estimates of total abundance for any of the five DPSs but that abundance was likely orders of magnitude lower than historical abundance given the available information for adult spawning abundance and natal juvenile abundance for some DPSs and given the reduced number of known spawning populations compared to historical records.

The ASMFC's most recent stock assessment for Atlantic sturgeon concluded that some of the DPSs have likely increased in abundance since closure of the Atlantic sturgeon fisheries in state and federal waters (ASMFC 2017). However, a lack of data hampered their efforts to assess the status of Atlantic sturgeon. New information available since the ESA-listing of the five DPSs was provided in the Stock Assessment as well as in the NOAA Fisheries 5-year reviews for each DPS. Based on the new and existing information, NOAA Fisheries concluded that the New York Bight, Chesapeake Bay, Carolina, and South

Atlantic DPSs should remain listed as endangered, and the Gulf of Maine DPS should remain listed as threatened.

The ASMFC is updating its Atlantic sturgeon assessment in 2024 and that information will be considered in the reinitiated Biological Opinion.

Figure 18. Total Estimated Gillnet Takes.



Source: Hocking 2024, available via Tables 3/4 at https://www.mafmc.org/actions/sturgeon-bycatch-framework

5.3.2 Protected Species Present in the Area

Numerous protected species occur in the affected environment of the Monkfish FMP (Table 7) and have the potential to be impacted by the proposed action (i.e., there have been observed/documented interactions in the fisheries or with gear types like those used in the fisheries (bottom trawl, gillnet gear)). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

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

Table 5. Species protected under the ESA and/or MMPA that may occur in the monkfish fishery affected environment.

Species	Status	Potentially impacted by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***Yes***
Humpback whale, West Indies DPS (*Megaptera novaeangliae)*	Protected (MMPA)	Yes
Fin whale (Balaenoptera physalus)	***Endangered***	***Yes***
Sei whale (Balaenoptera borealis)	***Endangered***	***Yes***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***Yes***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (Globicephala spp.)[2]	Protected (MMPA)	Yes
Pygmy sperm whale (*Kogia breviceps*)	Protected (MMPA)	No
Dwarf sperm whale (*Kogia sima*)	Protected (MMPA)	No
Risso's dolphin (*Grampus griseus*)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected (MMPA)	Yes
Short Beaked Common dolphin (*Delphinus delphis*)	Protected (MMPA)	Yes
Atlantic Spotted dolphin (*Stenella frontalis*)	Protected (MMPA)	No
Striped dolphin (*Stenella coeruleoalba*)	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[3]	***Protected (MMPA)***	***Yes***
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	Yes
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Giant manta ray (*Manta birostris)*	Threatened	Yes
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (*Brosme brosme)*	Candidate	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected (MMPA)	Yes
Gray seal (*Halichoerus grypus*)	Protected (MMPA)	Yes
Harp seal (*Phoca groenlandicus*)	Protected (MMPA)	Yes
Hooded seal (*Cystophora cristata*)	Protected (MMPA)	Yes
Critical Habitat		
North Atlantic Right Whale	ESA Designated	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA Designated	No
Johnson's Sea Grass	ESA Designated	No
Elkhorn and Staghorn corals	ESA Designated	No
Smalltooth Sawfish (U.S. DPS)	ESA Designated	No

Species	Status	Potentially impacted by this action?
Note: Marine mammal species italicized and in bold are considered MMPA strategic stocks, a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the 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 (Sect. 3, 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 NMFS Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region for further details.		

5.3.3 Species and Critical Habitat Unlikely to be Impacted by the Proposed Action

Based on available information, it has been determined that this action is unlikely to impact multiple ESA listed and/or MMPA protected species or any designated critical habitat (Table 7). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or based on the most recent ten years of observer, stranding, and/or marine mammal serious injury and mortality reports, there have been no observed or documented interactions between the species and the primary gear type (i.e., bottom trawl and gillnet) used to prosecute the monkfish fishery (Greater Atlantic Region (GAR) Marine Animal Incident Database, unpublished data; NMFS Marine Mammal Stock Assessment Reports (SARs) for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality Reference Documents, Publications, or Technical Memoranda; MMPA List of Fisheries (LOF); NMFS 2021a).[4] In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 7 and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2021a).

5.3.4 Species Potentially Impacted by the Proposed Action

Table 7 lists protected species of sea turtle, marine mammal, and fish species present in the affected environment of the monkfish fishery, and that may also be impacted by the operation of this fishery; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute the fishery. To aid in the identification of MMPA protected species potentially impacted by the action, NMFS Marine Mammal SARs for the Atlantic Region, MMPA List of Fisheries (LOF), NMFS (2021b) , NMFS NEFSC observer/sea sampling database (unpublished data), and NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality Reference Documents, Publications, or Technical Memoranda were referenced.

To help identify ESA listed species potentially impacted by the action, we queried the NMFS NEFSC observer/sea sampling (2010-2019), Sea Turtle Disentanglement Network (2010-2019), and the GAR Marine Animal Incident (2010-2019) databases for interactions, and reviewed the May 27, 2021,

[4] For marine mammals protected under the MMPA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2010-2019. For ESA listed species, information on observer or documented interactions with fishing gear is from 2010-2019.

Biological Opinion (Opinion)[5] issued by NMFS. The 2021 Opinion considered the effects of the NMFS' authorization of ten fishery management plans (FMP),[6] including the Monkfish FMP on ESA-listed species and designated critical habitat. The Opinion determined that the authorization of ten FMPs may adversely affect, but is unlikely to jeopardize, the continued existence of North Atlantic right, fin, sei, or sperm whales; the Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead, leatherback, Kemp's ridley, or North Atlantic DPS of green sea turtles; any of the five DPSs of Atlantic sturgeon; GOM DPS Atlantic salmon; or giant manta rays. The Opinion also concluded that the proposed action is unlikely to adversely affect designated critical habitat for North Atlantic right whales, the Northwest Atlantic Ocean DPS of loggerhead sea turtles, U.S. DPS of smalltooth sawfish, Johnson's seagrass, or elkhorn and staghorn corals. An Incidental Take Statement (ITS) was issued in the Opinion. The ITS includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

As the primary concern for both MMPA protected and ESA listed species is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types, to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the monkfish fishery and on protected species interactions with specific fishery gear is provided below.

5.3.4.1 Sea Turtles

Below is a summary of the status and trends, and the occurrence and distribution of sea turtles in the affected environment of the monkfish fishery. More information on the range-wide status of affected sea turtles species, and their life history is in several published documents, including NMFS (2021a); sea turtle status reviews and biological reports (Conant *et al.* 2009; Hirth 1997; NMFS & USFWS 1995; 2007a; b; 2013; TEWG 1998; 2000; 2007; 2009), and recovery plans for the loggerhead (Northwest Atlantic DPS) sea turtle (NMFS & USFWS 2008), leatherback sea turtle (NMFS & USFWS 1992; 1998b; 2020), Kemp's ridley sea turtle (NMFS & USFWS 2011), and green sea turtle (NMFS & USFWS 1991; 1998a).

Status and Trends.

Four sea turtle species have the potential to be impacted by the proposed action: Northwest Atlantic Ocean DPS of loggerhead, Kemp's ridley, North Atlantic DPS of green, and leatherback sea turtles (Table 7). Although stock assessments and similar reviews have been completed for sea turtles none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species.

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

[5] NMFS' May 27, 2021, Biological Opinion on the 10 FMPs is at: https://www.fisheries.noaa.gov/resource/document/biological-opinion-10-fishery-management-plans

[6] The ten FMPs considered in the May 27, 2021, Biological Opinion include: American Lobster, Atlantic Bluefish, Atlantic Deep-Sea Red Crab, Mackerel/Squid/Butterfish, Monkfish, Northeast Multispecies, Northeast Skate Complex, Spiny Dogfish, Summer Flounder/Scup/Black Sea Bass, and Jonah Crab.

Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (NMFS 2021a).

For Kemp's ridley sea turtles, from 1980-2003, the number of nests at three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) increased 15% annually (Heppell *et al.* 2005a); however, due to recent declines in nest counts, decreased survival of immature and adult sea turtles, and updated population modeling, this rate is not expected to continue and therefore, the overall trend is unclear (Caillouet *et al.* 2018; NMFS & USFWS 2015). In 2019, there were 11,090 nests, a 37.61% decrease from 2018 and a 54.89% decrease from 2017, which had the highest number (24,587) of nests; the reason for this recent decline is uncertain (NMFS 2021a). Given this and continued anthropogenic threats to the species, according to NMFS (2021a), the species resilience to future perturbation is low.

The North Atlantic DPS of green sea turtle, overall, is showing a positive trend in nesting; however, increases in nester abundance for the North Atlantic DPS in recent years must be viewed cautiously as the datasets represent a fraction of a green sea turtle generation which is between 30 and 40 years (Seminoff *et al.* 2015). While anthropogenic threats to this species continue, taking into consideration the best available information on the species, NMFS (2021a), concluded that the North Atlantic DPS appears to be somewhat resilient to future perturbations.

Leatherback turtle nesting in the Northwest Atlantic is showing an overall negative trend, with the most notable decrease occurring during the most recent time frame of 2008 to 2017 (Northwest Atlantic Leatherback Working Group 2018). The leatherback status review in 2020 concluded that leatherbacks are exhibiting an overall decreasing trend in annual nesting activity (NMFS & USFWS 2020). Given continued anthropogenic threats to the species, according to NMFS (2021a), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

Occurrence and Distribution.

Hard-shelled sea turtles. In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill *et al.* 2008; Braun & Epperly 1996; Epperly *et al.* 1995a; Epperly *et al.* 1995b). As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2002; Epperly *et al.* 1995a; Epperly *et al.* 1995b; Epperly *et al.* 1995c; Griffin *et al.* 2013; Morreale & Standora 2005; NMFS & USFWS 2020), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly *et al.* 1995a; Griffin *et al.* 2013; Hawkes *et al.* 2011; Shoop & Kenney 1992).

Leatherback sea turtles. Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (Dodge *et al.* 2014; Eckert *et al.* 2006; James *et al.* 2005; Murphy *et al.* 2006; NMFS & USFWS 2013). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006; NMFS & USFWS 1992). They are found in more northern waters (i.e., GOM) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (Dodge *et al.* 2014; James *et al.* 2005; James *et al.* 2006).

5.3.4.2 Large Whales

Status and Trends.

Six large whale species have the potential to be impacted by the proposed action: humpback, North Atlantic right, fin, sei, sperm, and minke whales (Table 8). Large whale stock assessment reports covering the period of 2010-2019, indicate a decreasing trend for the North Atlantic right whale population; however, for fin, humpback, minke, sperm, and sei whales, it is unknown what the population trajectory is as a trend analysis has not been conducted. The NMFS Marine Mammal SARs for the Atlantic Region has more information on the status of humpback, North Atlantic right, fin, sei, sperm, and minke whales.

Occurrence and Distribution.

As in Table 7, North Atlantic right, humpback, fin, sei, sperm, and minke whales occur in the Northwest Atlantic Ocean. As large whales may be present in these waters throughout the year, the monkfish fishery and large whales are likely to co-occur in the affected area. To further assist in understanding how the monkfish fishery overlaps in time and space with the occurrence of large whales, Table 8 has an overview of species occurrence and distribution in the affected environment of the fishery. More information on North Atlantic right, humpback, fin, sei, sperm, and minke whales is in: NMFS Marine Mammal SARs for the Atlantic Region.

Table 6. Large whale occurrence, distribution, and habitat use in the monkfish fishery affected environment.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
North Atlantic Right Whale	• Predominantly occupy waters of the continental shelf, but based on passive acoustic and telemetry data, are also known to make lengthy excursions into deep waters off the shelf. • Visual and acoustic data demonstrate broad scale, year-round presence along the U.S. eastern seaboard (e.g., GOM, New Jersey, and Virginia). • Surveys have demonstrated the existence of several areas where North Atlantic right whales congregate seasonally, including Cape Cod Bay; Massachusetts Bay; and the continental shelf south of New England. Although whales can be found consistently in particular locations throughout their range, there is a high inter-annual variability in right whale use of some habitats. Since 2010, acoustic and visual surveys indicate a shift in habitat use patterns, including: > Fewer individuals are detected in the Great South Channel; > increase in the number of individuals using Cape Cod Bay (i.e., during the expected late winter and early spring foraging period and during the 'off season' period of summer and fall); > apparent abandonment of central GOM in the winter; and, > Large increase in the numbers of whales detected in a region south of Martha's Vineyard and Nantucket Islands (i.e., during the expected late winter and early spring foraging period and during the 'off season' period of summer and fall). > Passive acoustic monitoring suggests a shift to a year-round presence in the Mid-Atlantic, including year-round detections in the New York Bight with the highest presence between late February and mid-May in the shelf zone and nearshore habitat).
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year. • New England waters (GOM and GB) = Foraging Grounds (~March- November); however, acoustic detections of humpbacks indicate year-round presence in New England waters, including the waters of Stellwagen Bank. • Mid-Atlantic waters: Increasing evidence that mid-Atlantic areas are becoming an important habitat for juvenile humpback whales.

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
	• Since 2011, increased sightings of humpback whales in the New York-New Jersey Harbor Estuary, in waters off Long Island, and along the shelf break east of New York and New Jersey. • Increasing visual and acoustic evidence of whales remaining in mid- and high-latitudes throughout the winter (e.g., Mid- Atlantic: waters near Chesapeake and Delaware Bays, peak presence about January through March; Massachusetts Bay: peak presence about March-May and September-December).
Fin	• Distributed throughout all continental shelf waters of the GOM to Mid-Atlantic; • Recent sighting data show evidence that, while densities vary seasonally, fin whales are present in every season throughout most of the EEZ north of 30°N. • New England waters (GOM and GB) = Major Foraging Ground
Sei	• Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks.; however incursions into shallower, shelf waters do occur (e.g., Stellwagen Bank, Great South Channel, waters south of Nantucket, Georges Bank). • Spring through summer, sightings concentrated along the northern, eastern (into Northeast Channel) and southwestern (in the area of Hydrographer Canyon) edge of Georges Bank, and south of Nantucket, MA. • Recent acoustic detections peaked in northern latitudes in the summer, indicating feeding grounds ranging from Southern New England through the Scotian Shelf. • Persistent year-round detections in Southern New England and the New York Bight indicate this area to be an important region for sei whales. • The wintering habitat remains largely unknown. Passive acoustic monitoring conducted in 2015-2016 off Georges Bank detected sei whales calls from late fall through the winter along the southern Georges Bank region (off Heezen and Oceanographer Canyons).
Sperm	• Distributed on the continental shelf edge, continental slope, and into mid-ocean regions. • Seasonal Occurrence in the U.S. EEZ: >**Winter**: concentrated east and northeast of Cape Hatteras; >**Spring**: center of distribution shifts northward to east of Delaware and Virginia, and is widespread throughout the central portion of the mid-Atlantic bight and the southern portion of Georges Bank; >**Summer**: similar distribution to spring, but also includes the area east and north of Georges Bank and into the Northeast Channel region, and the continental shelf (inshore of the 100-m isobath) south of New England; and, >**Fall**: occur in high levels south of New England, on the continental shelf. Also occur along continental shelf edge in the mid-Atlantic bight.
Minke	• Widely distributed within the U.S. EEZ. • Spring to Fall: widespread (acoustic) occurrence on the continental shelf; most abundant in New England waters during this period of time. • September to April: high (acoustic) occurrence in deep-ocean waters.
Note: SNE=Southern New England; GOM=Gulf of Maine; GB=Georges Bank *Sources:* Baumgartner et al. (2011; 2007); Baumgartner and Mate (2005); Bort et al. (2015); Brown et al. (Brown *et al.* 2018; 2002); CETAP (1982); Charif et al. (2020); Cholewiak et al. (2018); Clapham et al. (1993); Clark and Clapham (2004); Cole et al. (2013); Davis et al. (2017; 2020); Ganley et al. (2019); Good (2008); Hain et al. (1992); Hamilton and Mayo (1990); Hayes et al. (2017; 2018; 2019; 2020; 2021; 2022); Kenney et al. (1986; 1995); Khan et al. (2010; 2011; 2012; 2009); Kraus et al. (2016); Leiter et al. (2017); Mate et al. (1997); Mayo et al. (2018); McLellan et al. (2004); Moore et al. (2021); Morano et al. (2012); Muirhead et al. (2018); Murray et al. (2013); NMFS (1991; 2005; 2010; 2011; 2021a; b) 2012; 2015; NOAA (2008); Pace and Merrick (2008); Palka et al. (2017); Palka (2020)2020; Payne et al. (1984; 1990); Pendleton et al. (2009); Record et al. (2019); Risch et al. (2013); Robbins (2007); Roberts et al. (2016); Salisbury et al. (2016); Schevill et al. (1986);	

Species	Occurrence/Distribution/Habitat Use in the Affected Environment
Stanistreet et al. (2018); Stone et al. (2017); Swingle et al. (1993); Vu et al. (2012); Watkins and Schevill (1982); Whitt et al. (2013); Winn et al. (1986); 81 FR 4837 (January 27, 2016); 86 FR 51970 (September 17, 2021).	

5.3.4.3 Small Cetaceans

Status and Trends. Risso's, white-sided, short beaked common, and bottlenose dolphins (Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal stocks); long and short – finned pilot whales; and harbor porpoise are identified as having the potential to be impacted by the proposed action (Table 9). The latest stock assessment (Hayes *et al.* 2021) indicates that as a trend analysis has not been conducted for Risso's, white-sided, short-beaked common dolphins; long-finned pilot whales; or harbor porpoise, the population trajectory for these species is unknown. For short-finned pilot whales a generalized linear model indicated no significant trend in the abundance estimates (Hayes *et al.* 2022). For the Western North Atlantic Offshore stock, review of the most recent information on the stock shows no statistically significant trend in population size for this species; however, the high level of uncertainty in the estimates limits the ability to detect a statistically significant trend. Regarding the Northern and Southern Migratory Coastal stocks (both considered a strategic stock under the MMPA), the most recent analysis of trends in abundance suggests a probable decline in stock size between 2010–2011 and 2016, concurrent with a large UME in the area; however, there is limited power to evaluate trends given uncertainty in stock distribution, lack of precision in abundance estimates, and a limited number of surveys (Hayes *et al.* 2021).

Occurrence and Distribution. Atlantic white sided dolphins, short and long finned pilot whales, Risso's dolphins, short beaked common dolphins, harbor porpoise, and several stocks of bottlenose dolphins are found throughout the year in the Northwest Atlantic Ocean (see NMFS Marine Mammal SARs for the Atlantic Region). Within this range, however, there are seasonal shifts in species distribution and abundance. To further assist in understanding how the monkfish fishery overlaps in time and space with the occurrence of small cetaceans, Table 9 gives an overview of species occurrence and distribution in the affected environment of the fishery. More information on small cetacean occurrence and distribution in the Northwest Atlantic is in the NMFS Marine Mammal SARs for the Atlantic Region.

Table 7. Small cetacean occurrence and distribution in the monkfish fishery affected environment.

Species	Occurrence ad Distribution in the Affected Environment
Atlantic White Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM; however, most common in continental shelf waters from Hudson Canyon (~39°N) to GB, and into the GOM. • **January-May**: low densities found from GB to Jeffreys Ledge. • **June-September**: Large densities found from GB, through the GOM. • **October-December**: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic), particularly around Hudson Canyon, low densities found year-round, • Virginia (VA) and North Carolina (NC) waters represent southern extent of species range during winter months.
Short Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 m isobaths) of the Mid-Atlantic, SNE, and GB (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Less common south of Cape Hatteras, NC, although schools have been reported as far south as the Georgia/South Carolina border. • **January-May**: occur from waters off Cape Hatteras, NC, to GB (35° to 42°N). • **Mid-summer-autumn**: Occur in the GOM and on GB; *Peak abundance* found on GB in the autumn.

Species	Occurrence ad Distribution in the Affected Environment
Risso's Dolphin	• **Spring through fall**: Distributed along the continental shelf edge from Cape Hatteras, NC, to GB. • **Winter**: distributed in the Mid-Atlantic Bight, extending into oceanic waters. • Rarely seen in the GOM; primarily a Mid-Atlantic continental shelf edge species (can be found year-round).
Harbor Porpoise	• Distributed throughout the continental shelf of the Mid-Atlantic, SNE, GB, and GOM. • **July-September**: Concentrated in the northern GOM (waters <150 m); low numbers can be found on GB. • **October-December**: widely dispersed in waters from New Jersey (NJ) to Maine (ME); seen from the coastline to deep waters (>1,800 m). • **January-March**: intermediate densities in waters off NJ to NC; low densities found in waters off New York (NY) to GOM. • **April-June**: widely dispersed from NJ to ME; seen from the coastline to deep waters (>1,800 m). • Passive acoustic monitoring indicates regular presence from January through May offshore of Maryland.
Bottlenose Dolphin	**Western North Atlantic Offshore Stock** • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from GB to Florida (FL). • Depths of occurrence: ≥40 m **Western North Atlantic Northern Migratory Coastal Stock** • Most common in coastal waters <20 m deep. • Warm water months (e.g., July-August): distributed from the coastal waters from the shoreline to about 25-m isobaths between the mouth of the Chesapeake Bay and Long Island, NY. • Cold water months (e.g., January-March): stock occupies coastal waters from Cape Lookout, NC, to the NC/VA border. **Western North Atlantic Southern Migratory Coastal Stock** • Most common in coastal waters <20 m deep. • **October-December**: appears stock occupies waters of southern NC (south of Cape Lookout) • **January-March**: appears stock moves as far south as northern FL. • **April-June**: stock moves north to waters of NC. • **July-August**: stock is presumed to occupy coastal waters north of Cape Lookout, NC, to the eastern shore of VA (as far north as Assateague).
Pilot Whales: *Short- and Long-Finned*	**Short- Finned Pilot Whales** • Except for area of overlap (see below), primarily occur south of 40°N (Mid-Atlantic and SNE waters); although low numbers have been found along the southern flank of GB, but no further than 41°N. • Distributed primarily near the continental shelf break of the Mid-Atlantic and SNE (i.e., off Nantucket Shoals). **Long-Finned Pilot Whales** • Except for area of overlap (see below), primarily occur north of 42°N. • Winter to early spring: distributed principally along the continental shelf edge off the northeastern U.S. coast. • Late spring through fall: movements and distribution shift onto GB and into the GOM and more northern waters. • Species tends to occupy areas of high relief or submerged banks. **Area of Species Overlap:** along the mid-Atlantic shelf break between Delaware and the southern flank of GB.

Species	Occurrence ad Distribution in the Affected Environment
Notes: Information is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to 2,000 m depth. *Sources*: Hayes et al. (2017; 2018; 2019; 2020; 2022); Payne and Heinemann (1993); Payne et al. (1984); Jefferson et al. (2009).	

5.3.4.4 Pinnipeds

Status and Trends. Harbor, gray, harp and hooded seals are identified as having the potential to be impacted by the proposed action (Table 10). Based on Hayes et al. (2019; 2022), the status of the:

- Western North Atlantic harbor seal and hooded seal, relative to Optimum Sustainable Population (OSP), in the U.S. Atlantic EEZ is unknown;
- Gray seal population relative to OSP in U.S. Atlantic EEZ waters is unknown, but the stock's abundance appears to be increasing in Canadian and U.S. waters; and,
- Harp seal stock, relative to OSP, in the U.S. Atlantic EEZ is unknown, but the stock's abundance appears to have stabilized.

Occurrence and Distribution. Harbor, gray, harp, and hooded seals are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. Depending on species, they may be present year-round or seasonally in some portion of the affected environment of the monkfish fishery. Table 10 gives an overview of pinniped occurrence and distribution in the affected environment of the monkfish fishery. More information on pinniped occurrence and distribution in the Northwest Atlantic is in the NMFS Marine Mammal SARs for the Atlantic Region.

Table 8. Pinniped occurrence and distribution in the monkfish fishery affected environment.

Species	Occurrence and Distribution in the Affected Environment
Harbor Seal	• Year-round inhabitants of Maine; • September through late May: occur seasonally along the coasts from southern New England to Virginia.
Gray Seal	• Ranges from New Jersey to Labrador, Canada.
Harp Seal	• Winter-Spring (approx. January-May): Can occur in the U.S. Atlantic Exclusive Economic Zone. • Sightings and strandings have been increasing off the east coast of the United States from Maine to New Jersey.
Hooded Seal	• Highly migratory and can occur in waters from Maine to Florida. These appearances usually occur between January and May in New England waters, and in summer and autumn off the southeast U.S. coast and in the Caribbean.
Sources: Hayes et al. (2019, for hooded seals; 2022).	

5.3.4.5 Atlantic sturgeon

Status and Trends. As in Table 7, Atlantic sturgeon (all five DPSs) have the potential to be impacted by the proposed action. Population trends for Atlantic sturgeon are difficult to discern; however, the most recent stock assessment report concludes that Atlantic sturgeon, at both coastwide and DPS level, are depleted relative to historical levels (ASMFC 2017a; ASSRT 2007; NMFS 2021a).

Occurrence and Distribution. The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (Altenritter *et al.* 2017; ASMFC 2017b; ASSRT 2007; Breece *et al.* 2016;

Breece *et al.* 2017; Dadswell 2006; Dadswell *et al.* 1984; Dovel & Berggren 1983; Dunton *et al.* 2015; Dunton *et al.* 2010; Erickson *et al.* 2011; Hilton *et al.* 2016; Ingram *et al.* 2019; Kynard *et al.* 2000; Laney *et al.* 2007; Novak *et al.* 2017; O'Leary *et al.* 2014; Rothermel *et al.* 2020; Stein *et al.* 2004a; Waldman *et al.* 2013; Wippelhauser *et al.* 2017; Wirgin *et al.* 2015a; Wirgin *et al.* 2015b).

Based on fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour; however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Altenritter *et al.* 2017; Breece *et al.* 2016; Breece *et al.* 2018; Collins & Smith 1997; Dunton *et al.* 2010; Erickson *et al.* 2011; Ingram *et al.* 2019; Novak *et al.* 2017; Rothermel *et al.* 2020; Stein *et al.* 2004a; b; Wippelhauser *et al.* 2017). Data from fishery-independent and dependent surveys, and data collected from genetic, tracking, and/or tagging studies also indicate that Atlantic sturgeon make seasonal coastal movements from marine waters to river estuaries in the spring and from river estuaries to marine waters in the fall; however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year (Altenritter *et al.* 2017; Dunton *et al.* 2010; Erickson *et al.* 2011; Ingram *et al.* 2019; Novak *et al.* 2017; Rothermel *et al.* 2020; Wippelhauser 2012; Wippelhauser *et al.* 2017).

More information on the biology and range wide distribution of each DPS of Atlantic sturgeon is in 77 FR 5880 and 77 FR 5914 (February 6, 2012); the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007); the ASMFC 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017a); NMFS (2021a); and, the 5-year review for each Atlantic sturgeon DPS.

5.3.4.6 Atlantic salmon

Status and Trends. As in Table 10, Atlantic salmon (GOM DPS) have the potential to be impacted by the proposed action. There is no population growth rate available for GOM DPS Atlantic salmon; however, the consensus is that the DPS exhibits a continuing declining trend (NMFS 2021a; NMFS & USFWS 2018; NOAA 2016).

Occurrence and Distribution. The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the GOM (primarily the northern portion) to the coast of Greenland (Fay *et al.* 2006; NMFS & USFWS 2005; 2016). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay *et al.* 2006; Hyvärinen *et al.* 2006; Lacroix & Knox 2005; Lacroix & McCurdy 1996; Lacroix *et al.* 2004; NMFS & USFWS 2005; 2016; Reddin 1985; Reddin & Friedland 1993; Reddin & Short 1991; Sheehan *et al.* 2012; USASAC 2004). More information on the on the biology and range wide distribution of the GOM DPS of Atlantic salmon is in NMFS and USFWS (2005; 2016); Fay et al. (2006); and NMFS (2021a).

5.3.4.7 Giant Manta Ray

Status and Trends. Giant manta rays have the potential to be impacted by the proposed action (Table 7). While there is considerable uncertainty regarding the giant manta ray's current abundance throughout its range, the best available information indicates that in areas where the species is not subject to fishing, populations may be stable (NMFS 2021a). However, in regions where giant manta rays are (or were) actively targeted or caught as bycatch populations appear to be decreasing (Miller & Klimovich 2017).

Occurrence and Distribution. Based on the giant manta ray's distribution, the species may occur in coastal, nearshore, and pelagic waters off the U.S. east coast, usually found in water temperatures between 19 and 22°C and have been observed as far north as New Jersey. Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller & Klimovich 2017).

5.3.5 Gear Interactions and Protected Species

Protected species are at risk of interacting with various types of fishing gear, with interaction risks associated with gear type, quantity, soak or tow duration, and degree of overlap between gear and protected species. Information on observed or documented interactions between gear and protected species is available from as early as 1989 (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data). As the distribution and occurrence of protected species and the operation of fisheries (and, thus, risk to protected species) have changed over the last 30 years, we use the most recent 10 years of available information to best capture the current risk to protected species from fishing gear. For marine mammals protected under the MMPA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2011-2020 (GAR Marine Animal Incident Database, unpublished data; Cole *et al.* 2013; Hayes *et al.* 2017; 2018; 2019; 2020; Hayes *et al.* 2021; Hayes *et al.* 2022; Hayes *et al*. 2023; Henry *et al.* 2017; Henry *et al.* 2016; Henry *et al*. 2019; Henry *et al.* 2020; Henry *et al.* 2021; Henry *et al*. 2022; Henry *et al.* 2023; Waring *et al.* 2016). For ESA listed species, the most recent ten years of data on observed or documented interactions is available from 2013-2022 (ASMFC 2017a; Kocik *et al.* 2014; unpublished data: GAR Marine Animal Incident Database, NMFS NEFSC observer/sea sampling database, GAR Sea Turtle and Disentanglement Network, NMFS Sea Turtle Stranding and Salvage Network; NMFS 2021a) (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC protected species serious injury and mortality Reference Documents, Publications, or Technical Memoranda). Available information on gear interactions with a given species (or species group) is in the sections below. This is not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is on the main gear types used to prosecute the monkfish fishery (i.e., sink gillnet and bottom trawl gear).

5.3.5.1 Sea Turtles

Bottom Trawl Gear. Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso & Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of our earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2008; 2015; 2020; NMFS 2021a; Warden 2011a; NMFS NEFSC observer/sea sampling database, unpublished data; 2011b). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with trawl gear in this region. As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic and Georges Bank.

Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents. Most recently, Murray (2020) provided information on sea turtle interaction rates from 2014-2018 (the most recent five-year period that has been statistically analyzed for trawls). Interaction rates were stratified by region, latitude zone, season, and depth. The highest loggerhead interaction rate (0.43 turtles/day fished) was in waters south of 37º N during November to June in waters over 50 m deep. The most estimated interactions occurred in the Mid-Atlantic region north of 39º N, during July to October in waters under 50 m deep. In each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

Based on Murray (2020)[7], from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI=0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. On Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

Gillnet Gear. Interactions between sink gillnet gear and green, Kemp's ridley, loggerhead, and leatherback sea turtles have been observed in the GAR since 1989 (NMFS NEFSC observer/sea sampling database, unpublished data). Specifically, sea turtle interactions with gillnet gear have been observed in the GOM, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the GOM (Murray 2009a; b; 2013; 2018; NMFS 2021a; NMFS NEFSC observer/sea sampling database, unpublished data). As few sea turtle interactions have been observed in the GOM, there is insufficient data available to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with sink gillnet gear in this region. As a result, the bycatch estimates and discussion below are for sink gillnet gear in the Mid-Atlantic and Georges Bank.

From 2012-2016 , Murray (2018) estimated that sink gillnet fisheries in the Mid-Atlantic and Georges Bank[8] bycaught 705 loggerheads (CV=0.29, 95% CI over all years: 335-1116), 145 Kemp's ridleys (CV =0.43, 95% CI over all years: 44-292), 27 leatherbacks (CV =0.71, 95% CI over all years 0-68), and 112 unidentified hard-shelled turtles (CV=0.37, 95% CI over all years: 64-321).[9] Of these, mortalities were estimated at 557 loggerheads, 115 Kemp's ridley, 21 leatherbacks, and 88 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 19 adults. The highest bycatch rate of loggerheads occurred in the southern Mid-Atlantic stratum (≤ 37°N to 34°N) in large mesh (≥ 7 inches) gear during November to June. Though only one sea turtle was observed in this stratum, observed effort was low, leading to a high bycatch rate. Bycatch rates of all other species were lower relative to loggerheads. Highest estimated loggerhead bycatch occurred in the northern mid-Atlantic (>37°N to the Georges Bank boundary) from July to October in large mesh gears due to the higher levels of commercial effort in the stratum. Mean loggerhead bycatch rates were ten times those of Kemp's ridley bycatch rates in large mesh gear in the northern Mid-Atlantic from July to October (Murray 2018). Although interactions between sink gillnet gear and green sea turtles have been observed (NEFSC observer/sea sampling database, unpublished data); green sea turtles were excluded from the bycatch rate calculations in Murray (2018) because the observed interaction occurred in waters of North Carolina, and therefore, outside the study region.

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

[8] The boundaries of the Mid-Atlantic and Georges Bank were defined by Ecological Production Units (Murray 2018).

[9] Murray (2018) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches Murray (2009a); (2013), where rates were estimated using GAMs. Ratio estimator results may be like to those using GAM or GLM if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007; Murray & Orphanides 2013; Orphanides 2010).

Updates to Murray (2018) were recently issued by Murray (2023). From 2017-2021[10], Murray (2023) estimated that sink gillnet fisheries operating from Maine to North Carolina[11] bycaught 142 loggerheads (CV=0.89, 95% CI over all years: 15-376), 91 Kemp's ridleys (CV =0.62, 95% CI over all years: 0-218), 49 greens (CV=1.01, 95% CI over all years: 0-177), 26 leatherbacks (CV=0.98, 95% CI over all years: 0-79), and 32 unidentified hard-shelled turtles (CV=0.59, 95% CI over all years: 0-75). Of these interactions, mortalities were estimated at 88 loggerheads, 56 Kemp's ridley, 30 greens, 16 leatherbacks, and 20 unidentified hard-shelled sea turtles. Total estimated loggerhead bycatch was equivalent to 2.5 adults. The highest interaction rate of loggerhead sea turtles occurred in the northern Mid-Atlantic (>37ºN to the Georges Bank boundary) from July to October in large mesh gears (≥ 7 inches); relative to loggerheads, interaction rates were lower for all other sea turtle species.

5.3.5.2 Atlantic Sturgeon

Sink gillnet and bottom trawl gear. The ASMFC (2017a), Miller and Shepard (2011), NMFS (2021a), Boucher and Curti (2023) and the most recent ten years of NMFS observer data (i.e., 2013-2022; NMFS NEFSC observer/sea sampling database, unpublished data) describe the observed or documented interactions between Atlantic sturgeon and bottom trawl and gillnet gear in the GAR. For sink gillnets, higher levels of Atlantic sturgeon bycatch have been associated with depths under 40 m, mesh sizes over ten in., and the months of April and May ASMFC (2007). For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch has been associated with depths under 30 m. More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic surgeon, with Atlantic sturgeon encountered primarily at depths under 20 m (ASMFC 2017a).

Boucher and Curti (2023) updated the estimate of Atlantic sturgeon bycatch that was presented in the ASMFC (2017a) Atlantic sturgeon benchmark stock assessment for the annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl, gillnet). The assessment analyzed fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2021 (excluding 2020 due to COVID-related impacts on data collection). The total bycatch of Atlantic sturgeon from bottom otter trawls was between 638-836 fish over 2016-2021 (excluding 2020 due to COVID-related impacts on data collection), while the total bycatch of Atlantic sturgeon from gillnets ranged from 1,031-1,268 fish. The estimated average annual bycatch during 2016-2021 of Atlantic sturgeon in bottom otter trawl gear is 718.4 individuals and in gillnet gear is 1,125.4 individuals.

5.3.5.3 Atlantic Salmon

Sink gillnet and bottom trawl gear. Atlantic salmon are at risk of interacting with bottom trawl or gillnet gear (Kocik *et al.* 2014; NMFS 2021a; NEFSC observer/sea sampling database, unpublished data). Northeast Fisheries Observer Program (NEFOP) data from 1989-2022 show records of incidental bycatch of Atlantic salmon in seven of the 31 years, with a total of 15 individuals caught, nearly half of which

[10] Due to the COVID 19 pandemic, observer coverage rates were greatly reduced in 2020 and 2021. Murray (2023) determined that estimated interactions derived from a 3-year time series (2017-2019) did not differ significantly from those derived from the 5-year time series (2017-2021), suggesting that reduced and uneven observer monitoring in 2020 and 2021 did not bias the results using the longer time series. As a result, observer data from 2017-2019 was used to estimate sea turtle interaction rates, confidence intervals, and CVs for the 2017-2021 time series.

[11] Murray (2023) defined this range as the boundaries of the Gulf of Maine, Georges Bank, and Mid-Atlantic Ecological Production Units.

(seven) occurred in 1992 (NMFS NEFSC observer/sea sampling database, unpublished data).[12] Of the observed incidentally caught Atlantic salmon, ten were listed as "discarded," which is assumed to be a live discard (Kocik, pers comm.; February 11, 2013). Five of the 15 were documented as lethal interactions. The incidental takes of Atlantic salmon occurred in bottom otter trawls (4) and gillnets (11). Observed captures occurred in March (2), April (2), May (1), June (3), August (1), and November (6). Given the very low number of observed Atlantic salmon interactions in gillnet and bottom trawl gear, interactions with these gear types are believed to be rare in the GAR.

5.3.5.4 Giant Manta Ray

Sink gillnet and bottom trawl gear. Giant manta rays are potentially susceptible to capture by bottom trawl and gillnet gear based on records of their capture in fisheries using these gear types (NMFS 2021a; NMFS NEFSC observer/sea sampling database, unpublished data). The most recent 10 years of NEFOP data show that between 2013-2022, one giant manta ray and five unidentified *Mobulidae* were observed in bottom trawl gear and two were observed in gillnet gear (NMFS NEFSC observer/sea sampling database, unpublished data). Also, all the giant manta ray interactions in gillnet or trawl gear recorded in the NEFOP database (13 in 2001-2022) indicate the animals were encountered alive and released alive. However, details about specific conditions such as injuries, damage, time out of water, how the animal was moved or released, or behavior on release is not always recorded. While there is no information on post-release survival, NMFS Southeast Gillnet Observer Program observed a range of 0-16 giant manta rays captured per year between 1998 and 2015 and estimated that approximately 89% survived the interaction and release (NMFS reports: http://www.sefsc.noaa.gov/labs/panama/ob/gillnet.htm).

5.3.5.5 Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or pot/trap gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2023 LOF (88 FR 16899, March 21, 2023) categorizes commercial sink gillnet fisheries (Northeast and Mid-Atlantic) as a Category I fishery; and bottom trawl fisheries (Northeast or Mid-Atlantic) as a Category II fishery. No changes for how these fisheries are categorised were proposed for the 2024 LOF (88 FR 62748; September 13, 2023).

5.3.5.5.1 Large Whales

Bottom Trawl Gear. The most recent 10 years of observer, stranding, and/or baleen whale serious injury and mortality determinations from 2012-2021, and the GAR Marine Animal Incident database shows that there has been one observed or confirmed documented interactions with large whales and bottom trawl gear. In 2020, a humpback whale was anchored/entangled in fishing gear, later identified by NMFS as trawl net. The animal was disentangled by responders from the Atlantic Large Whale Disentanglement Network. The gear was removed and recovered from the animal, and the whale was released alive with non-serious injuries. Additional information on this incident can be found in the 2020 Atlantic Large Whale Entanglement Report and in Henry et al. 2023).

[12] There is no information available on the genetics of these bycaught Atlantic salmon, so it is not known how many of them were part of the GOM DPS. It is likely that some of these salmon, particularly those caught south of Cape Cod, may have originated from the stocking program in the Connecticut River. Those Atlantic salmon caught north of Cape Cod and/or in the Gulf of Maine are more likely to be from the GOM DPS.

Sink Gillnet Gear. Large whale interactions (entanglements) with fishing gear have been observed and documented in the waters of the Northwest Atlantic.[13] Information available on all interactions (e.g., entanglement, vessel strike, unknown cause) with large whales comes from reports documented in the GARFO Marine Animal Incident Database (unpublished data). The level of information collected for each case varies, but may include details on the animal, gear, and any other information about the interaction (e.g., location, description, etc.). Each case is evaluated using defined criteria to assign the case to an injury/information category using all available information and scientific judgement. In this way, the injury severity and cause of injury/death for the event is evaluated, with serious injury and mortality determinations issued by the NEFSC.[14]

Based on the best available information, the greatest entanglement risk to large whales is posed by fixed gear used in trap/pot or sink gillnet fisheries (Hartley et al. 2003; Johnson et al. 2005;Whittingham et al. 2005a,b; Knowlton et al. 2012; NMFS 2021a,b; Hamilton and Kraus 2019; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Sharp et al. 2019; Pace et al. 2021; NMFS *Marine Mammal SARs for the Atlantic Region*). Specifically, while foraging or transiting, large whales are at risk of becoming entangled in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, and the net panels of gillnet gear that rise into the water column (Baumgartner et al. 2017; Cassoff et al. 2011; Cole and Henry 2013; Hamilton and Kraus 2019; Hartley et al. 2003; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Johnson et al. 2005; Kenney and Hartley 2001; Knowlton and Kraus 2001;Knowlton et al. 2012; NMFS 2021a,b; Whittingham et al. 2005a,b; see NMFS *Marine Mammal SARs for the Atlantic Region*).[15] Large whale interactions (entanglements) with these features of trap/pot and/or sink gillnet gear often result in the serious injury or mortality to the whale (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry 2013; Henry et al. 2014, Henry et al. 2015, Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Knowlton and Kraus 2001, Knowlton et al. 2012; Moore and Van der Hoop 2012; NMFS 2014; NMFS 2021a,b; Pettis et al. 2021; Sharp et al. 2019; van der Hoop et al. 2016; van der Hoop et al. 2017). In fact, review of Atlantic coast-wide causes of large whale human interaction incidents between 2010 and 2019 shows that entanglement is the highest cause of mortality and serious injury for North Atlantic right, humpback, fin, and minke whales in those instances when cause of death could be determined (NMFS 2021b). As many entanglements, and therefore, serious injury or mortality events, go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, the rate of large whale entanglement, and thus, rate of serious injury and mortality due to entanglement, are likely underestimated (Hamilton et al. 2018; Hamilton et al. 2019; Knowlton et al. 2012; NMFS 2021a,b; Pace et al. 2017; Robbins 2009).

As noted above, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the Northwest Atlantic Ocean. As fin, and North Atlantic right whales are listed as endangered under the ESA, these

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[13] NMFS Atlantic Large Whale Entanglement Reports: For years prior to 2014, contact David Morin, Large Whale Disentanglement Coordinator, David.Morin@NOAA.gov; GAR Marine Animal Incident Database (unpublished data); NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region; NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations Reference Documents, Publications, or Technical Memoranda; MMPA List of Fisheries; NMFS 2021a,b.

[14] NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations Reference Documents, Publications, or Technical Memoranda.

[15] Through the ALWTRP, regulations have been implemented to reduce the risk of entanglement in in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, and the net panels of gillnet gear. ALWTRP regulations currently in effect are summarized online.

species are considered strategic stocks under the MMPA. Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[16] In 1997, the ALWTRP was implemented; however, since 1997, it has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In 2021, adjustments to Plan were implemented and are summarized online.

The ALWTRP consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries. The ALWTRP recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S, and identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.[17]. Further details on the Plan are at: the ALWTRP.

5.3.5.5.2 Small Cetaceans and Pinnipeds

Sink Gillnet and Bottom Trawl Gear. Small cetaceans and pinnipeds are vulnerable to interactions with sink gillnet and bottom trawl gear.[18] Reviewing marine mammal stock assessment and serious injury reports that cover the most recent 10 years data (i.e., 2011-2020), and the MMPA LOF's covering this time frame (i.e., issued between 2017 and 2023), Table 11 has a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA LOF Category I (frequent interactions) gillnet and/or Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the monkfish fishery. Of the species in Table 11, gray seals, followed by harbor seals, harbor porpoises, short beaked common dolphins, and harps seals are the most frequently bycaught small cetacean and pinnipeds in sink gillnet gear in the GAR (Hatch & Orphanides 2014; 2015; 2016; Orphanides 2019; 2020; 2021; Orphanides & Hatch 2017; Precoda & Orphanides 2022). In terms of bottom trawl gear, short-beaked common dolphins, Risso's dolphins, Atlantic white-sided dolphins, and gray seals are the most frequently observed bycaught marine mammal species in the GAR, followed by long-finned pilot whales, bottlenose dolphin (offshore), harbor porpoise, harbor seals, and harp seals (Chavez-Rosales *et al.* 2017; Lyssikatos 2015; Lyssikatos & Chavez-Rosales 2022; Lyssikatos *et al.* 2020; 2021).

[16] The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.

[17] The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet .

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

Table 9. Small cetacean and pinniped species incidentally injured and/or killed by Category I sink gillnet fisheries or Category II bottom trawl fisheries operating in the affected environment of the monkfish fishery between 2010-2019.

Fishery	Category	Species Incidentally Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore; Northern Migratory Coastal)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Long-finned pilot whales
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet	I	Bottlenose dolphin (offshore, Northern and Southern Migratory coastal)
		Harbor porpoise
		Short-beaked common dolphin
		Harbor seal
		Hooded seal
		Harp seal
		Gray seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Long-finned pilot whales
		Short-beaked common dolphin
		Atlantic white-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Bottlenose dolphin (offshore)
		Gray seal
		Harbor seal
Source: MMPA 2017-2023 LOFs		

To address the high levels of incidental take of harbor porpoise and bottlenose dolphins in sink gillnet fisheries, pursuant to section MMPA Section 118(f)(1), the Harbor Porpoise Take Reduction Plan (HPTRP) and the Bottlenose Dolphin Take Reduction Plan (BDTRP) were developed and implemented

for these species.[19] Also, due to the incidental mortality and serious injury of small cetaceans, incidental to bottom and midwater trawl fisheries operating in both the Northeast and Mid- Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy was implemented. More information on each take reduction plan or strategy is at: NMFS HPTRP, NMFS BDTRP, or NMFS Atlantic Trawl Gear Take Reduction Strategy.

5.4 Physical Environment and Essential Fish Habitat

The Northeast U.S. Shelf Ecosystem has been described as including the area from the GOM south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Sherman *et al.* 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 m. Four distinct sub-regions comprise the NOAA Fisheries Greater Atlantic Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing Georges Bank and the Mid-Atlantic Bight.

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, NC. 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.

Pertinent physical and biological characteristics of each of these sub-regions are described in the Physical and Biological Environment section of Amendment 5 (Section 4.2), along with a short description of the physical features of coastal environments. Monkfish habitats are described in Section 4.4.1 of Amendment 5 and summarized below. Information on the affected physical and biological environments included in Amendment 5 was extracted from Stevenson et al. (2004).

5.4.1 Fishing Effects on EFH

A detailed discussion of fishing impacts on EFH is contained in the Affected Environment Section of Amendment 5 to the Monkfish FMP and in the Affected Environment Section 6 of the 2023 Spiny Dogfish Specifications EA (MAFMC 2023). Since monkfish and spiny dogfish EFH has been determined to not be vulnerable to any fishing gear (Stevenson *et al.* 2004), the discussion focuses on gillnet gear that potentially could impact EFH of other fisheries given that is the focus of this action. Discussion in Monkfish Amendment 5 and the 2023 Spiny Dogfish Specifications EA cites several important peer-reviewed studies in describing the potential biological and physical effects of fishing on various substrates (mud, sand, gravel and rocky substrates). Since gillnets are stationary or static, the gear has been determined to not have an adverse effect on EFH of other species.

[19] Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal SARs (Hayes *et al.* 2022) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

5.4.2 Essential Fish Habitat

Section 4.4 of Monkfish Amendment 5 and Section 6 of the 2023 Specifications Environmental Assessment (MAFMC 2023) contain detailed descriptions of monkfish and spiny dogfish EFH, respectively. EFH of other species vulnerable to gillnet, the effect of the monkfish and spiny dogfish fisheries on EFH (monkfish, spiny dogfish, and other species, all life stages), and previous measures to minimize adverse effects of the monkfish and spiny dogfish fisheries on EFH can also be found in those documents.

In summary, monkfish and spiny dogfish EFH have been determined to only be minimally vulnerable to bottom gillnets. Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. There are no species or life stages for which EFH is more than minimally vulnerable to bottom gillnets (Stevenson et al., 2004).

5.5 Human Communities

Monkfish Focus

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery and the relevant human communities, so Section 5.6 (monkfish focus) and 5.7 (spiny dogfish focus) differ in formatting.

5.5.1 Permits and Vessels

The Monkfish FMP has seven types of federal permits: six categories of limited access permits (A-D, F, H) and one open access permit (E, Table 12). The number of fishing vessels with limited access monkfish permits has decreased over the past decade, from 670 to 562 (Table 13). Of those vessels, about 35-48% landed over 1 lb of monkfish each year and about 9-20% landed ≥ 10,000 lb of monkfish. Permit category C and D vessels consistently accounted for the greatest portion of vessels with monkfish permits and landing monkfish (Table 13, Table 14).

Table 10. Monkfish permit categories.

Permit Category		Description
Limited Access	A	DAS permit that *does not* also have a groundfish or scallop limited access permit (possession limits vary with permit type).
	B	
	C	DAS permit that *also* has a groundfish or scallop limited access permit (possession limits vary with permit type).
	D	
	F	Seasonal permit for the offshore monkfish fishery.
	H	DAS permit for use in the Southern Fishery Management Area *only*.
Open Access	E	Open access incidental permit.

Table 11. Fishing vessels with federal monkfish permits, with number of vessels landing over 1 lb and 10,000 lb, FY 2012-2021.

Permit Category	2012			2015			2018			2021		
	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb	All	>1lb	>10K lb
A	22	6	4	22	4	*	20	*	*	18	8	6
B	44	9	5	42	4	*	38	6	4	38	19	15
C	295	148	60	267	128	30	268	110	30	255	114	42
D	292	94	28	242	59	10	226	77	18	229	115	50
F	9	6	4	17	9	*	17	14	4	14	13	0
H	8	5	4	8	6	5	7	6	3	8	*	0
Total LA	**670**	**268**	**105**	**598**	**210**	**51**	**576**	**214**	**60**	**562**	**270**	**113**
E	1,743	338	19	1,578	247	8	1,525	247	20	1,485	176	7
Source: GARFO Permit database and DMIS as of April 2022.												

Table 12. Proportion of monkfish landings by permit category to total monkfish landings in the year, FY 2012-2021.

Permit Category	2012	2015	2018	2021
A and B	15%	13%	16%	12%
C and D	75%	80%	77%	83%
F	2%	2%	1%	>1%
H	1%	1%	1%	0%
E	7%	5%	5%	4%
All	**100%**	**100%**	**100%**	**100%**
Source: GARFO Permit database and DMIS as of April 2022.				

5.5.2 Catch and Landings

From FY 2017-2021, the ACL was exceeded in the NFMA twice and never in the SFMA (Table 15). Commercial landings made up 77-90% of total catch in the NFMA and 30-59% in the SFMA. State landings, defined as vessels that have never had a federal fishing permit, consistently make up under 0.5% of catch. Recreational catch is consistently under 3% of catch. In the NFMA, discards were 9% of catch in FY 2017 and increased to 28% and lowered to 20% and 19% of catch in FY 2018-2020; discards were similar in FY 2021 (21%). In the SFMA, discards were higher in FY 2017-2019 (41-43%) but lowered to 13% in FY 2020 and increased to 27% in FY 2021.

Table 13. Year-end monkfish annual catch limit (ACL) accounting, FY 2017-2021.

Catch accounting element	Pounds	Metric tons	% of ACL
FY 2017			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	15,003,103	6,805	89.6%
State-permitted only vessel landings	60,031	27	0.4%
Estimated discards	1,567,883	711	9.4%
Recreational catch (MRIP landings and discards)	11,725	5.3	0.1%
Total Northern monkfish catch	**16,642,742**	**7,549**	**99.4%**
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	8,392,979	3,807	30.9%
State-permitted only vessel landings	66,936	30	0.2%
Estimated discards	11,531,614	5,231	42.5%
Recreational catch (MRIP landings and discards)	1,627	1	0.0%
Total Southern monkfish catch	**19,993,156**	**9,068**	**73.6%**
FY 2018			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	13,237,011	6,004	79.1%
State-permitted only vessel landings	37,468	17	0.2%
Estimated discards	4,666,815	2,117	27.9%
Recreational catch (MRIP landings and discards)	6,977	3	0.0%
Total Northern monkfish catch	**17,948,271**	**8,141**	**107.2%**
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	10,133,407	4,596	37.3%
State-permitted only vessel landings	64,841	29	0.2%
Estimated discards	11,505,833	5,219	42.4%
Recreational catch (MRIP landings and discards)	742,988	337	2.7%
Total Southern monkfish catch	**22,447,069**	**10,181**	**82.7%**
FY 2019			
Northern Fishery Management Area (ACL = 7,592 mt)			
Commercial landings	13,673,898	6,202	81.7%
State-permitted only vessel landings	16,474	7	0.1%
Estimated discards	3,418,346	1,551	20.4%
Recreational catch (MRIP landings and discards)	164,771	75	1.0%
Total Northern monkfish catch	**17,273,489**	**7,835**	**103.2%**
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	8,236,922	3,736	30.3%
State-permitted only vessel landings	66,673	30	0.2%
Estimated discards	11,174,259	5,069	41.2%

Recreational catch (MRIP landings and discards)	11,410	5	0.0%
Total Southern monkfish catch	**19,489,264**	**8,840**	**71.7%**
FY 2020			
Northern Fishery Management Area (ACL = 8,351 mt)			
Commercial landings	11,684,519	5,300	63.5%
State-permitted only vessel landings	13,416	6	0.1%
Estimated discards	3,503,282	1,589	19.0%
Recreational catch (MRIP landings and discards)	23,077	10	0.1%
Total Northern monkfish catch	**15,224,294**	**6,905**	**82.7%**
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	4,944,794	2,243	18.2%
State-permitted only vessel landings	20,749	9	0.1%
Estimated discards	3,078,040	1,396	11.3%
Recreational catch (MRIP landings and discards)	359,987	163	1.3%
Total Southern monkfish catch	**8,453,570**	**3,834**	**31.1%**
FY 2021			
Northern Fishery Management Area (ACL = 8,351 mt)			
Commercial landings	11,496,640	5,215	62.4%
State-permitted only vessel landings	18,511	8	0.1%
Estimated discards	3,857,341	1,750	21.0%
Recreational catch (MRIP landings and discards)	7	0	0.0%
Total Northern monkfish catch	**15,372,499**	**6,973**	**83.5%**
Southern Fishery Management Area (ACL = 12,316 mt)			
Commercial landings	4,338,159	1,968	16.0%
State-permitted only vessel landings	32,185	15	0.1%
Estimated discards	7,278,106	3,301	26.8%
Recreational catch (MRIP landings and discards)	30,056	14	0.1%
Total Southern monkfish catch	**11,678,506**	**5,298**	**43.0%**

Notes:
"Commercial landings" includes all monkfish landings by vessels with a permit number over zero, RSA landings, and party/charter landings sold to a federal dealer.
"State-permitted only vessel landings" are landings from vessels that never had a federal fishing permit (so the permit #=0).
"Recreational catch" includes landings and discards from party charter vessels and private anglers, not sold to a federal dealer.

Source: Commercial fisheries dealer and Northeast Fishery Observer Program databases; FY 2017 data accessed 10/2018; FY 2018 accessed 3/2020; FY 2019 accessed 3/2021; FY 2020 accessed 4/22; Marine Recreational Information Program database.

Landings

Landings since FY 2016 have been higher in the NFMA than in the SFMA. The NFMA has had a higher TAL and higher possession limits relative to the SFMA (Table 16). Landings relative to TAL in the NFMA have been between 80-107% since FY 2016, which could be a combination of revised management measures (possession limits) and the large 2015-year class. The NFMA TAL was increased by 10% for FY 2020-2022 (relative to FY 2017-2019) and the individuals from the 2015-year class have grown large enough to be retained by the fishery and are less likely to be discarded because of minimum size regulations. The landings relative to TAL in the SFMA have been lower than the NFMA, between 39-51% since FY 2016.

Table 14. Recent landings (whole/live weight, mt) in the NFMA and SFMA compared to target TAL.

Fishing Year	Northern Area			Southern Area		
	TAL (mt)	Landings (mt)	Percent of TAL achieved	TAL (mt)	Landings (mt)	Percent of TAL achieved
2014	5,854	3,403	58%	8,925	5,415	61%
2015	5,854	4,080	70%	8,825	4,733	53%
2016	5,854	5,447	93%	8,925	4,345	49%
2017	6,338	6,807	107%	9,011	3,802	42%
2018	6,338	6,168	97%	9,011	4,600	51%
2019	6,338	6,211	98%	9,011	3,785	42%
2020	6,624	5,299	80%	5,882	2,294	39%
2021	6,624	5,228	79%	5,882	1,982	34%
*2022	6,624	3,569	54%	5,882	1,366	23%

*Data as of February 16, 2023.
Landings values are different than the annual catch limit accounting in Table 15 because these are the landings as of April 30 each year. Includes RSA landings.
Source: GARFO quota monitoring data, accessed 3/6/2023.

FY 2021 landings. In FY 2021, 79% of the FY 2021 TAL was landed in the northern area and 34% in the southern area. In the NFMA, monthly landings were lower in May-November 2021 relative to December-March (312-417 mt/month vs. 501-654 mt/month). Otter trawls accounted for 63% of the FY 2021 landings. In the SFMA, monthly landings were highest in May and June 2021 (439-535 mt/month), then dropped to a low in July-November (9-59 mt/month), then were moderate since December (117-227 mt/month). These data and additional information can be found at GARFO's Quota Monitoring website: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports//monkfish/mul.htm.

Landings and discards by gear type. The northern and southern areas have distinctions in terms of gear type. Since at least 1980, monkfish landings in the NFMA have largely been by vessels using trawls (NEFMC 2022b), 84% on average since 2012 (Table 17). In the SFMA, landings were primarily by vessels using dredges and trawls from 1980 to the early 1990s. Through the 1990s and to today, gillnets have been the predominant gear for vessels landing monkfish, 72% on average since 2012.

Discards have traditionally been higher in the SFMA relative to the NFMA, and since 2017, southernessential discards have approximated landings, exceeding landings in 2020 (Table 18). In the NFMA, discards have been primarily with otter trawl gear (64%), followed by scallop dredges (29%), and gillnets (7%) over the last 10 years. In the SFMA, discards have been primarily with scallop dredges (78%), followed by otter trawl (16%), and gillnets (6%).

Table 15. Landings by gear type (mt), CY 2012-2021.

Calendar Year	Gillnet		Otter trawl		Scallop Dredge		Total[a]
Northern Fishery Management Area							
2012	359	9%	3,561	87%	135	3%	**4,081**
2013	424	13%	2,813	84%	114	3%	**3,355**
2014	424	12%	2,958	86%	36	1%	**3,434**
2015	678	17%	3,277	80%	100	2%	**4,086**
2016	629	13%	3,949	84%	111	2%	**4,723**
2017	984	14%	6,044	85%	44	1%	**7,105**
2018	870	14%	4,958	83%	153	3%	**6,009**
2019	1,029	17%	4,950	81%	53	1%	**6,084**
2020	554	10%	5,020	90%	11	0%	**5,587**
2021	961	19%	4,122	80%	20	0%	**5,121**
Annual average	**691**	**14%**	**4,165**	**84%**	**78**	**2%**	**4,959**
Southern Fishery Management Area							
2012	3,614	64%	1,144	20%	766	14%	**5,674**
2013	3,394	65%	1,115	21%	627	12%	**5,207**
2014	3,139	62%	1,029	20%	899	18%	**5,099**
2015	3,293	72%	674	15%	542	12%	**4,550**
2016	3,247	75%	577	13%	372	9%	**4,331**
2017	2,773	73%	547	14%	418	11%	**3,796**
2018	3,346	76%	497	11%	486	11%	**4,388**
2019	3,526	81%	357	8%	260	6%	**4,373**
2020	1,956	75%	387	15%	190	7%	**2,593**
2021	1,530	76%	300	15%	150	7%	**2,005**
Annual Average	2,982	**72%**	663	**15%**	471	**11%**	**4,202**

Source: Deroba (2022).

[a] The total column includes landings from other minor gear types.

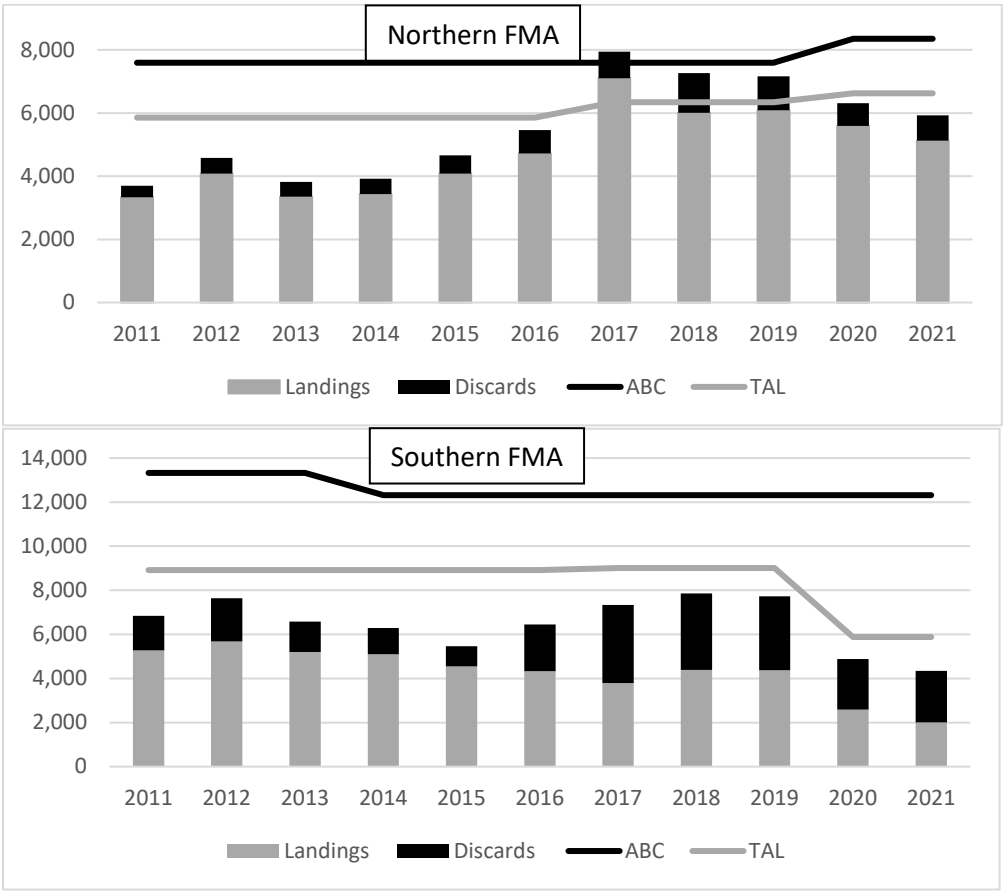
Table 16. Discards by gear type (mt), CY 2012-2021.

Calendar Year	Gillnet		Otter trawl		Scallop Dredge		Total
Northern Fishery Management Area							
2012	20	4%	233	47%	240	49%	**493**
2013	32	7%	300	65%	127	28%	**459**
2014	27	6%	384	79%	73	15%	**484**
2015	42	7%	462	81%	68	12%	**572**
2016	56	8%	483	66%	195	27%	**734**
2017	31	4%	712	85%	96	11%	**840**
2018	66	5%	404	32%	783	62%	**1,253**
2019	54	5%	512	47%	514	48%	**1,080**
2020	109	15%	528	73%	85	12%	**723**
2021	62	8%	500	62%	240	30%	**802**
Annual average	**50**	**7%**	**452**	**64%**	**242**	**29%**	**744**
Southern Fishery Management Area							
2012	192	10%	187	10%	1,583	81%	**1,962**
2013	236	17%	106	8%	1,030	75%	**1,372**
2014	151	13%	143	12%	893	75%	**1,188**
2015	73	8%	262	29%	583	64%	**919**
2016	87	4%	552	26%	1,475	70%	**2,114**
2017	116	3%	581	16%	2,847	80%	**3,544**
2018	142	4%	398	11%	2,936	84%	**3,476**
2019	172	5%	456	14%	2,730	81%	**3,358**
2020	82	4%	722	31%	1,491	65%	**2,295**
2021	67	3%	127	5%	2,147	92%	**2,340**
Annual Average	**132**	**6%**	**353**	**16%**	**1,772**	**78%**	**2,257**
Source: Deroba (2022).							

Fishery performance relative to specifications

Fishery catch has largely been below the ACL and landings below TAL since 2011, except for in 2017-2019 (Figure 19, Table 15).

Figure 19. ABC, TAL, landings, and discards (mt), 2011-2021



Note: Landings and discards are calendar year data from the assessment. ABC and TAL are the FY specifications.

5.5.3 Revenue

Monkfish fishery revenue has generally declined in recent years, from $42.2M in CY 2005 to $10.3M in CY 2021 (Table 19, not adjusted for inflation). Since at least CY 2011, about half of this revenue is from trips where monkfish was over 50% of total revenue (Table 20). There is a declining number of vessels that had trips where the monkfish revenue was over 50% of total revenue, from 206 in CY 2011 to 76 in CY 2021. CY 2020 and 2021 were particularly low revenue years. On trips where a monkfish DAS was used in FY 2021 (Table 21), 61% of the revenue was from monkfish, 17% from skate, 13% from groundfish, and minor components of the revenue from other species. Monkfish price per live pound has been on a declining trend since 2010, though prices have been increasing within the last year (Figure 20). Seasonally, prices tend to be lower in spring to summer months and higher in fall to winter.

Table 17. Total monkfish revenue, CY 2005 – 2021.

Calendar Year	Revenue	Calendar Year	Revenue
2005	$42.2M	2014	$18.7M
2006	$38.0M	2015	$19.1M
2007	$28.9M	2016	$20.0M
2008	$27.2M	2017	$18.4M
2009	$19.6M	2018	$14.8M
2010	$19.2M	2019	$14.5M
2011	$26.6M	2020	$9.3M
2012	$27.1M	2021	$10.3M
2013	$18.7M		

Source: ACCSP data, accessed April 2022.
Note: Revenues not adjusted for inflation.

Table 18. Monkfish revenue and revenue dependence on trips where over 50% of revenue is from monkfish, CY 2011 – 2021.

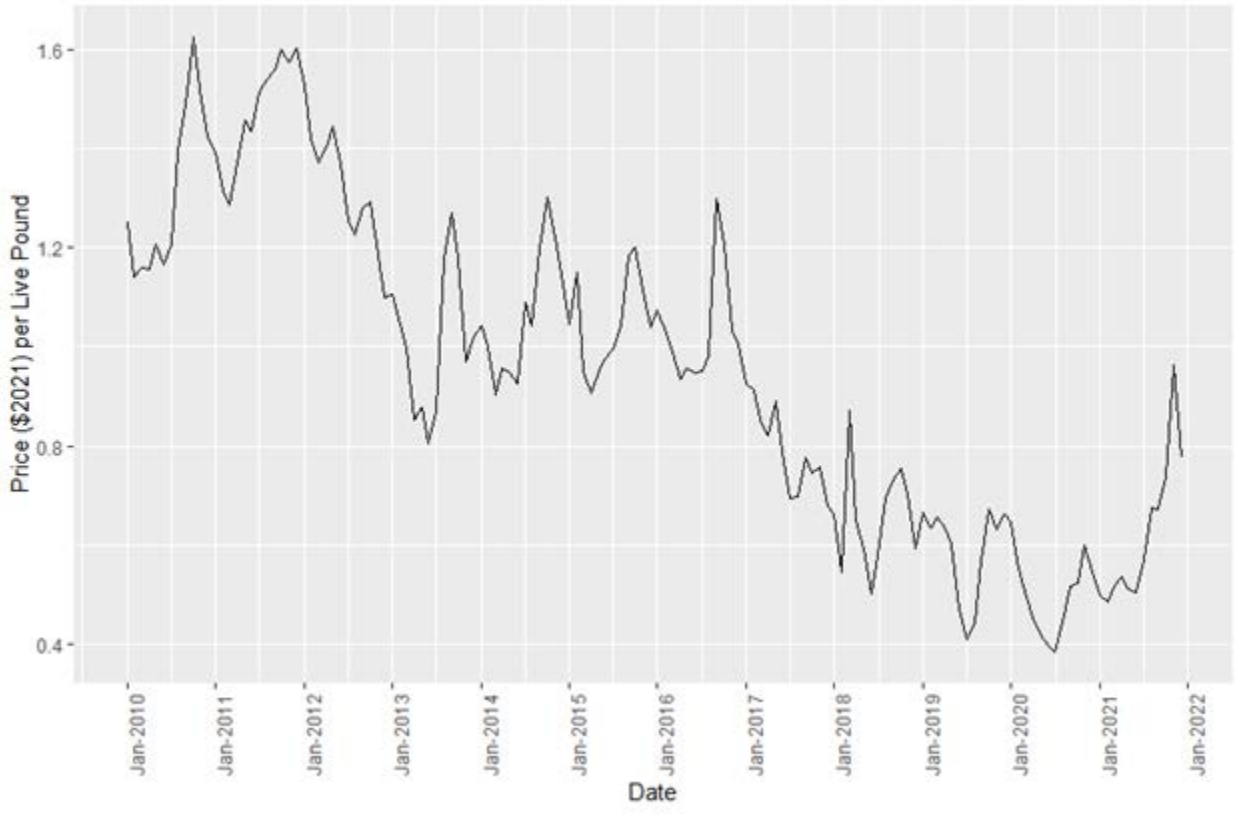
Calendar Year	Vessels	Monkfish Revenue		Non-Monkfish Revenue		Total Revenue	% Monkfish
		Total	Per vessel	Total	Per vessel		
2011	206	$16,517,143	$80,180	$3,354,458	$16,284	$19,871,601	83%
2012	196	$15,138,030	$77,235	$3,339,764	$17,040	$18,477,794	82%
2013	164	$8,994,464	$54,844	$2,414,798	$14,724	$11,409,262	79%
2014	173	$9,307,800	$53,802	$3,042,854	$17,589	$12,350,654	75%
2015	140	$9,319,537	$66,568	$2,286,111	$16,329	$11,605,648	80%
2016	127	$9,654,776	$76,022	$1,957,503	$15,413	$11,612,280	83%
2017	135	$9,471,858	$70,162	$2,545,266	$18,854	$12,017,124	79%
2018	108	$7,001,537	$64,829	$1,660,777	$15,378	$8,662,314	81%
2019	96	$7,021,724	$73,143	$1,912,752	$19,924	$8,934,476	79%
2020	70	$2,700,687	$38,581	$995,332	$14,219	$3,696,019	73%
2021	76	$3,611,791	$47,524	$1,057,492	$13,914	$4,669,283	77%

Source: NEFSC SSB. *Note:* Revenues adjusted to 2021 USD.

Table 19. Landings and revenue dependence from monkfish and other fisheries on trips where a Monkfish DAS was used, FY 2021.

	Live pounds	Revenue	
Monkfish	3,507,169	$2,464,974	61%
Skate	3,382,423	$699,805	17%
Groundfish	270,948	$542,289	13%
Dogfish	75,295	$21,890	1%
Other	70,806	$308,774	8%
Total	**7,306,641**	**$4,037,732**	**100%**
Source: GARFO/APSD, accessed January 2023. Note: Includes trips where only a monkfish DAS is used and trips where a monkfish DAS and other DAS are used.			

Figure 20. Monthly monkfish price ($2021) per live pounds, 2010 – 2021.



Source: NEFSC SSB, July 2022. *Note:* Revenues adjusted to 2021 USD.

5.5.4 Fishing Effort

Effort controls such as Days-at-Sea (DAS) and possession limits help ensure that the fishery landings remain within the TAL. Framework 10 established the possession limits and DAS allocations for FY 2017-2019, and these remain unchanged through FY 2022.

5.5.4.1 Day-at-Sea (DAS)

DAS use. DAS allocations have remained the same since FY 2017 (Framework 10). Limited access vessels are allocated 35 monkfish DAS per fishing year to use in the NFMA and 37 DAS to be used in the SFMA. Additionally, vessels are prohibited from using more than 46 total allocated DAS annually. The number of monkfish DAS used each year is far below what is allocated, suggesting a substantial amount of latent effort in the monkfish fishery. An average of 575 permits were allocated DAS between FY 2019 – 2021, with permit categories C and D accounting for the greatest number of vessels and DAS (Table 22). DAS use varies with permit category. Of the Category A and B permit vessels, 52-64% used at least one DAS in FY 2019-2020, but that decreased to 28-38% in FY 2021. The Category C and D vessels had more stable participation, but was generally lower, 4-18% these past three years.

Table 20. Monkfish DAS usage, combined management areas and all vessels with a limited access monkfish permit, FY 2019 – FY 2021.

Permit Category	All Vessels			Vessels that used ≥ 1 DAS
	Total Vessels	DAS Allocated	DAS Used	
FY 2019				
A	21	909	385	11 (52%)
B	39	1,689	750	25 (64%)
C	273	11,821	583	24 (9%)
D	238	10,305	850	42 (18%)
FY 2020				
A	15	650	193	9 (60%)
B	37	1,602	444	23 (62%)
C	268	11,604	334	17 (6%)
D	229	9,916	490	32 (14%)
FY 2021				
A	18	779	130	5 (28%)
B	37	1,602	280	14 (38%)
C	255	11,042	177	11 (4%)
D	223	9,656	397	24 (11%)

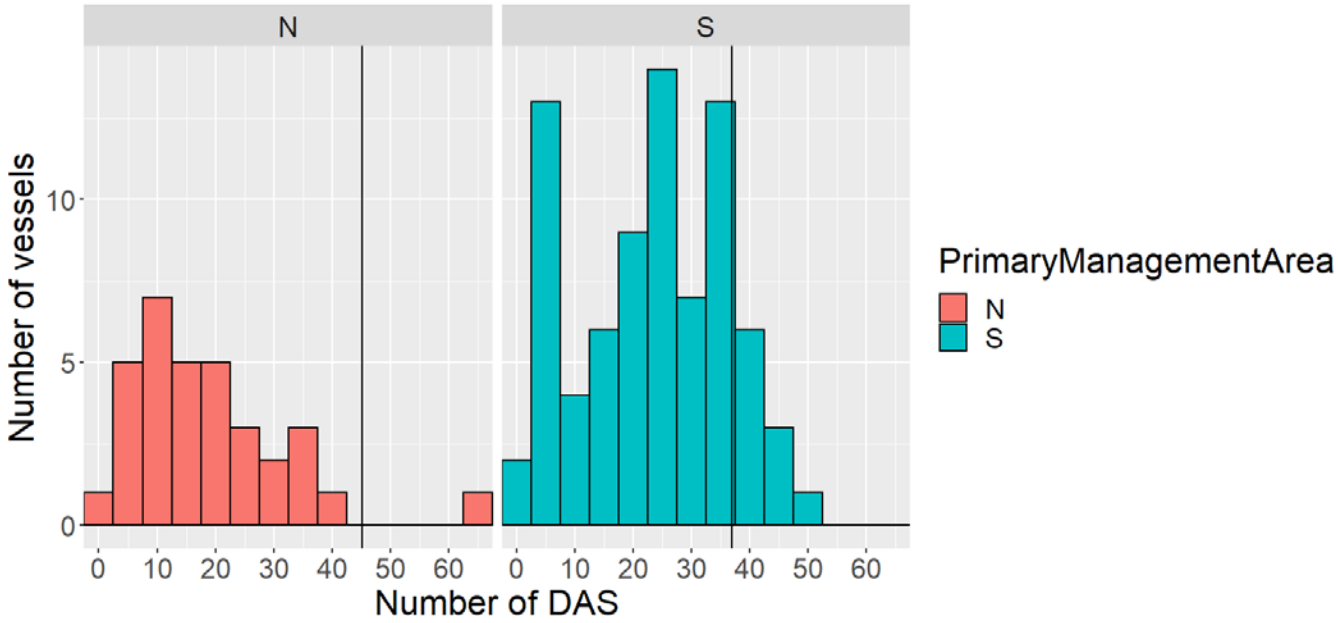
Notes: Permit categories F and H account for a minor number of permits, DAS allocated, and DAS used, thus, are not included in table.

Data include all vessels with a monkfish limited access permit (i.e., all activity codes).

Source: NMFS Vessel Permits and Allocation Management System (AMS) databases, accessed March 2022.

The use of the monkfish DAS allocation varies by vessel and fishing area. In FY 2019 and 2021, vessels that fished primarily in the NFMA used fewer monkfish DAS relative to vessels fishing primarily in the SFMA, despite the 37 DAS use restriction in the SFMA (Figure 21). Some of the vessels fishing primarily in the SFMA vessels exceeded the 37 DAS use restriction, but some of these vessels also took trips in the NFMA, where there is no DAS use restriction. For vessels fishing primarily in the NFMA, one vessel used more than the 45.2 DAS allocated. For primarily SFMA vessels, 12 vessels used more than 37 DAS and 2 used more than 45.2.

Figure 21. Frequency of monkfish DAS use by vessels allocated monkfish DAS, FY 2019 and FY 2021 average.



Notes: Black vertical line represents annual DAS allocations that can be used in the NFMA (45.2) and the SFMA (37). Each vessel was binned into one management area based on where most of its trips occurred.

Source: CAMS database. Accessed October 2022.

FY 2021, 2019 monkfish landings by trip declaration.

Although use of a monkfish DAS is required for landing more than incidental amounts of monkfish, a substantial amount of monkfish landings occur on the incidental trips, particularly in the NFMA. An average of FY 2021 and FY 2019 performance is used to illustrate this. In the NFMA, the most trips and about 86% of the monkfish landings were on trips that did not use a monkfish DAS (Table 23). In the SFMA, vessels using a monkfish DAS accounted for the most trips and 73% of the monkfish landings.

In the NFMA, most of the monkfish landings are on trips using a Northeast (NE) multispecies DAS. Vessels with a Category C and D monkfish permit that also has a limited access NE multispecies DAS permit can declare a monkfish DAS while at sea in the NFMA if they are fishing on a NE multispecies DAS and declare the "monkfish option" prior to leaving port at the start of its trip. When these vessels do not declare a monkfish DAS, their monkfish landings are constrained by a possession limit (900 lb and 750 lb tail weight for Category C and D, respectively, per NE multispecies used; Table 26). If these vessels do select the "monkfish option" while at sea, then they declare and use a monkfish DAS and do not have a monkfish possession limit (unlimited). Trips using a multispecies DAS but not a monkfish DAS accounted for 85% (8.4M lb) of the NFMA monkfish landings, averaged over FY 2019 and FY 2021. Trips using both a NE multispecies and monkfish DAS accounted for >14% (>1.35 M lb) that year. The vessels participating in the Northeast multispecies sector fishery accounted for the greatest amount of monkfish landings.

Besides the NE multispecies fishery, monkfish is landed in other fisheries without a monkfish DAS declaration: declared out of fishery (DOF), scallop, herring, surfclam/ocean quahog/mussel, squid/mackerel/butterfish, and undeclared (Table 23). Out of these fisheries, trips that are DOF or use only a scallop DAS account for the greatest amount of landings.

Table 21. Monkfish landings and total number of vessels and trips by trip declarations (plan code) and DAS used, average across FY 2019 and FY 2021. Orange highlights indicate trips where monkfish was landed without a monkfish DAS.

Declaration/ Plan Code	Program Code Description	DAS used	Whole weight, live lb (mt in parentheses)	# of Vessels	# of Trips
NORTH					
Monkfish	*Monkfish Northern Management Area Common Pool Vessel Trip*	Monkfish and Northeast Multispecies	C	C	C
	Monkfish Northern Management Area Sector Vessel Trip	Monkfish and Northeast Multispecies	1,347,155 (611)	21	222
	Monkfish Northern Management Area Monkfish-Only Vessel Trip	Monkfish	26,851 (12)	6	20
Northeast Multispecies	*Multispecies Common Pool Vessel Trip*	Northeast Multispecies	55,255 (25)	5	100
	Multispecies Sector Vessel Trip	Northeast Multispecies	8,289,963 (3,760)	99	2,992
Scallop	*Special Access Area*	Scallop	43,979 (20)	20	28
	Limited Access General Category	Scallop	17,145 (8)	19	223
	Limited Access	Scallop	12,611 (6)	7	11
Other	*Herring; undeclared; surfclam, ocean quahog, mussel; squid, mackerel, butterfish*	-	61,447 (28)	22	469
Declared out of Fishery (DOF)		-	10,820 (5)	11	32
NORTH Landings Total			**> 9,865,226 (4,475)**		

SOUTH					
Monkfish	*Monkfish Southern Management Area Common Pool Vessel Trip*	Monkfish and Northeast Multispecies	62,203 (28)	5	25
	Monkfish Southern Management Area Sector Vessel Trip	Monkfish and Northeast Multispecies	493,536 (224)	15	178
	Monkfish Southern Management Area Monkfish-Only Vessel Trip	Monkfish	3,200,563 (1,452)	50	1,183
Northeast Multispecies	*Multispecies Common Pool Vessel Trip*	Northeast Multispecies	50,555 (23)	14	145
	Multispecies Sector Vessel Trip	Northeast Multispecies	100,963 (46)	27	482
Scallop	*Special Access Area*	Scallop	168,319 (76)	91	210
	Limited Access General Category	Scallop	87,994 (40)	56	986
	Limited Access	Scallop	145,156 (66)	69	106
Other	*Herring, undeclared, surfclam/ocean quahog/mussel and squid/mackerel/butterfish*	-	575,484 (261)	243	2,195
DOF		-	293,271 (133)	152	2,094
		SOUTH Landings Total	**5,178,044 (2,349)**		

Notes:

- C = confidential, < 3 vessels. The 'Total' number of vessels is not the sum of the columns but the sum of the unique vessels.
- In the "Other" rows, data for undeclared trips include incidental landings, which do not require any declaration.
- The total monkfish landings from this table differs slightly from Table 16 likely due to differences in data source (CAMS versus quota monitoring), requirement of having a monkfish permit category associate with monkfish landings in Table 25, and when the data were pulled.
- Data do not include RSA trips; DOF includes scientific and other research trips.

Source: CAMS database. Accessed November 2022.

5.5.4.2 Possession Limits

There are multiple monkfish possession limits depending on whether the vessel has a limited access or open access incidental monkfish permit, the specific permit category, whether a monkfish DAS is being used, and if so, whether the monkfish DAS is used alone or in combination with DAS for other fisheries (Table 24, Table 25).

Monkfish Possession Limits while on a Monkfish DAS

Table 22. NFMA FY 2020-2022 monkfish limited access possession limits while fishing on a monkfish DAS.

Monkfish Permit Category	Description	FY 2020-2022 Monkfish Possession Limits (lb)	Previous Possession Limits
A	Only monkfish DAS	1,250 lb tail weight 3,638 lb whole weight	No change since at least FY 2011.
B		600 lb tail weight 1,746 lb whole weight	
C	Only monkfish DAS	1,250 lb tail weight 3,638 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	Unlimited	FW9 (FY16): eliminated limit; No change since then.
D	Only monkfish DAS	600 lb tail weight 1,746 lb whole weight	No change in since at least FY 2011.
	Monk DAS & NE Mults A or Scallop DAS	Unlimited	FW9 (FY16): eliminated limit; No change since then.

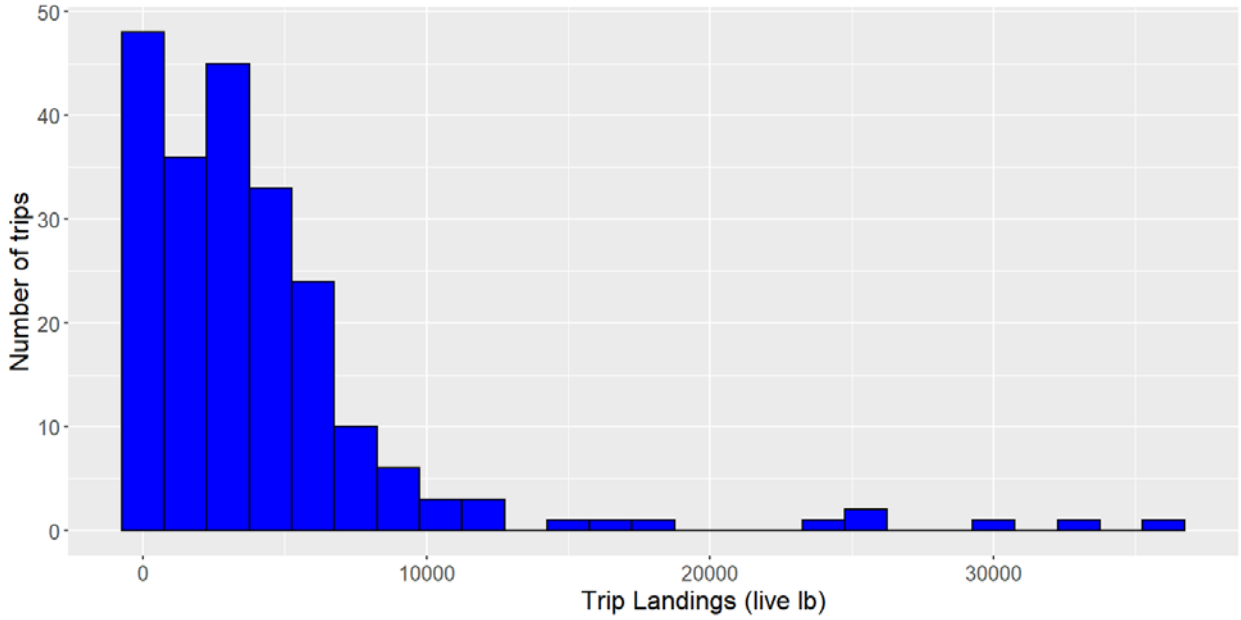
Table 23. SFMA FY 2020-2022 monkfish limited access possession limits while fishing on at least a monkfish DAS.

Monkfish Permit Category	Description	FY 2020-2022 Monkfish Possession Limits (lb)	Previous Possession Limits
A	Only monkfish DAS	700 lb tail weight 2,037 lb whole weight	No change since FY 2017.
B		575 lb tail weight 1,673 lb whole weight	
C	Only monkfish DAS	700 lb tail weight 2,037 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	700 lb tail weight 2,037 lb whole weight	
D	Only monkfish DAS	575 lb tail weight 1,673 lb whole weight	
	Monk DAS & NE Mults A or Scallop DAS	700 lb tail weight 2,037 lb whole weight	
F	Seasonal offshore monkfish fishery in SFMA (Oct. 1-April 30)	1,600 lb tail weight 4,656 lb whole weight	No change since at least FY 2011.
H	SFMA only	575 lb tail weight 1,673 lb whole weight	No change since FY 2017.

Vessels that use both a Northeast Multispecies (NE) DAS and a monkfish DAS in the NFMA have an unlimited monkfish possession limit. FY 2021, 16 vessels took at least one trip that used both DAS, taking a total of 208 trips, landing an average of 8,554 lb (whole weight) of monkfish per trip, with a

range from 603 lb to 36,212 lb, whole weight (Figure 22, Table 23). There is no monkfish landing limit for these trips.

Figure 22. Frequency of trip landings while using both a monkfish and Northeast Multispecies DAS, FY 2021.



Source: CAMS database. Accessed October 2022.

Incidental Possession Limits. To land incidental amounts of monkfish from federal waters, vessels must have a federal monkfish permit and not fish on a monkfish DAS. Incidental monkfish can be caught while on a Northeast Multispecies DAS, on a Scallop DAS or in the Sea Scallop Access Area Program, not under a DAS Program, and not under a DAS program that also hold permits in other fisheries/special cases. Incidental possession limits vary by trip type, gear, and management area (Table 26).

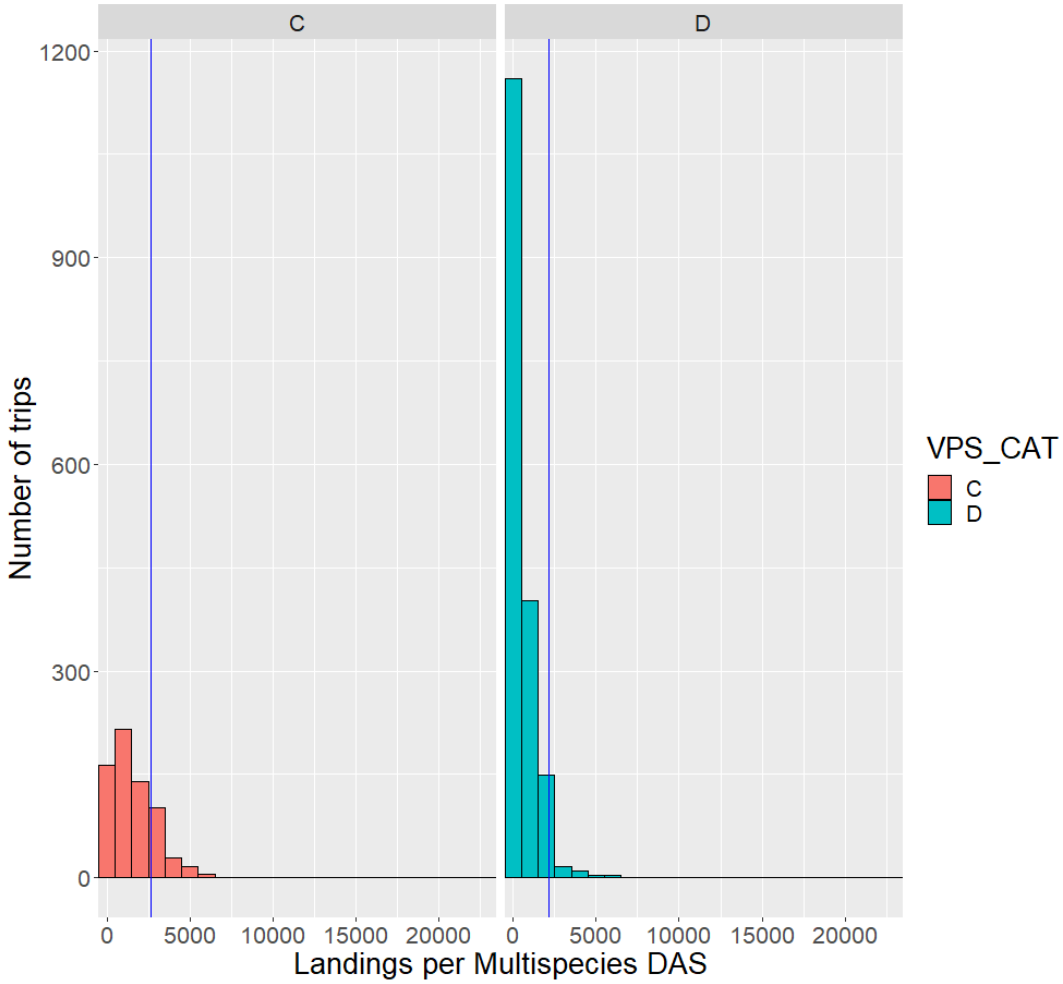
Vessels have the flexibility to land over the incidental limit when fishing on a Northeast Multispecies A DAS (e.g., a sector trip) if the vessel fishes only in the NFMA and declares the 'monkfish option' on the VMS unit before leaving port. If the vessel "flexes" the monkfish option during the trip (e.g., when landings exceed the incidental limit), then the vessel is charged both a Monkfish and NE Multispecies DAS and this is considered a directed monkfish trip. If the vessel selects the monkfish option prior to leaving port but does not flex on that option, then the vessel can only land incidental amounts of monkfish.

Table 24. Monkfish incidental possession limits by management area, gear, and permit category. Source: GARFO.

Incidental Possession Limit Category			Management Area	Incidental Possession Limits by gear, permits
While on a NE Multispecies DAS			NFMA	*All gear* - 900 lb tail weight (2,619 lb whole weight; permit C), 750 lb (2,183 lb whole weight; permit D), up to 300 lb (permits E/F/H)
			SFMA	*Non-trawl* – 50 lb tail weight for permits C, D, H *Trawl* – 300 lb tail weight for permits C, D, H
While on a Scallop DAS or in the Sea Scallop Access Area Program			NFMA and SFMA	*All gear* - 300 lb tail weight
While not under a DAS Program	GOM, GB Reg. Mesh Areas			5% of total fish weight on board
	SNE Reg. Mesh Area			50 lb tail weight/day, up to 150 lb per trip
	MA Exemption Area			5% of total fish weight on board up to 450 lb tail weight
	NFMA or SFMA			50 lb tail weight/day, up to 150 lb per trip
	And fishing under skate bait Letter of Authorization		SNE Reg. Mesh Area	50 lb tail weight/day, up to 150 lb per trip
	And holds permits in other fisheries/special cases	NE Multispecies Small Vessel Permit	NFMA or SFMA	*All gear* - 50 lb tail weight/day, up to 150 lb per trip
		Surfclam or ocean quahog permit		*Hydraulic clam dredge or mahogany quahog dredge* - 50 lb tail weight/day, up to 150 lb per trip
		Sea scallop permit		*Scallop dredge only* - 50 lb tail weight/day, up to 150 lb per trip. *If in scallop dredge exemption areas* - 50 lb tail weight/trip

In FY 2021, most NFMA monkfish landings were from vessels participating in the NE Multispecies sector program using only a Northeast Multispecies DAS (10.1 M live lb, Table 23). These incidental trips were harvested by vessels using either a monkfish C or D permit category using either trawl or gillnet gear, thus, have incidental limits of 2,619 lb and 2,183 lb whole weight per Northeast Multispecies DAS used (Table 26). The average incidental landings per Multispecies DAS used were 1,638 lb and 573 lb whole weight for permit category C and D, respectively (Figure 23). Most monkfish landings while only on a NE Multispecies DAS were less than the possession limits, however, some trips did exceed these limits (Table 27).

Figure 23. Frequency of monkfish landings per Northeast Multispecies DAS in the NFMA for permit categories C and D, FY 2021.



Notes: Blue vertical lines represent trip possession limits while using a Northeast multispecies DAS in the NFMA (2,619 lb for permit C and 2,183 lb for permit D, whole weight).
RSA trips were removed.
Source: CAMS and discard modules, November 2022.

Table 25. Monkfish landings (lb, whole weight) under and over incidental trip limits while using and not using a Northeast Multispecies DAS, by permit category, FY 2021.

Permit Category	Trips using NE Mult. DAS					Trips not using NE Mult. DAS (undeclared or NE Mult. sector or common pool)*	
	Trips landing < incidental limit		Trips landing > incidental trip limits				
	Total Landings	# Trips	Total Landings	Landings in excess**	# Trips	Total Landings	# Trips
C	5,242,947	620	196,625	49,961	56	1,098,745	251
D	2,171,167	1,674	243,711	59,392	72	877,139	750
TOTAL	7,414,116	2,294	440,336	109,353	128	1,975,884	1,001

Notes: RSA trips were removed from data.

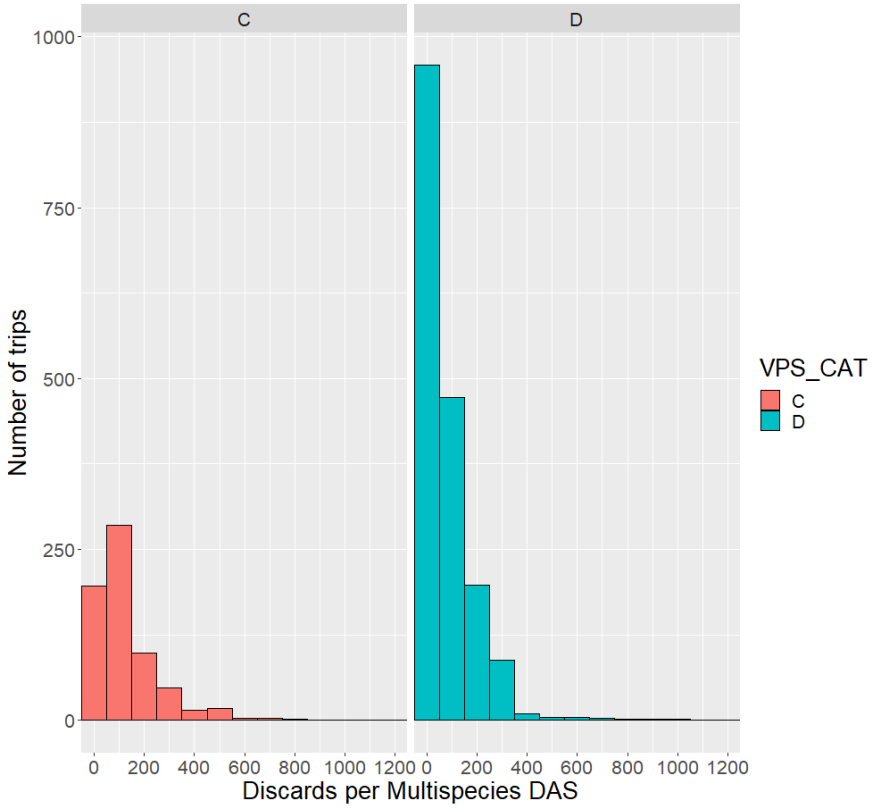
* These are either undeclared or NE Multispecies sector or common pool trips where a DAS is not required. These trips have incidental possession limits (146 lb whole weight per day, not to exceed 437 lb whole weight per trip). ~30% of these trips are landing over the incidental amount, landing 888,504 lb whole weight in excess, but some of these trips are Exempted Fishing Permit trips which have different possession limits.

** Only includes the landings more than the incidental possession limits (i.e., does not include the incidental landings legally allowed).

Source: CAMS and discard modules, November 2022.

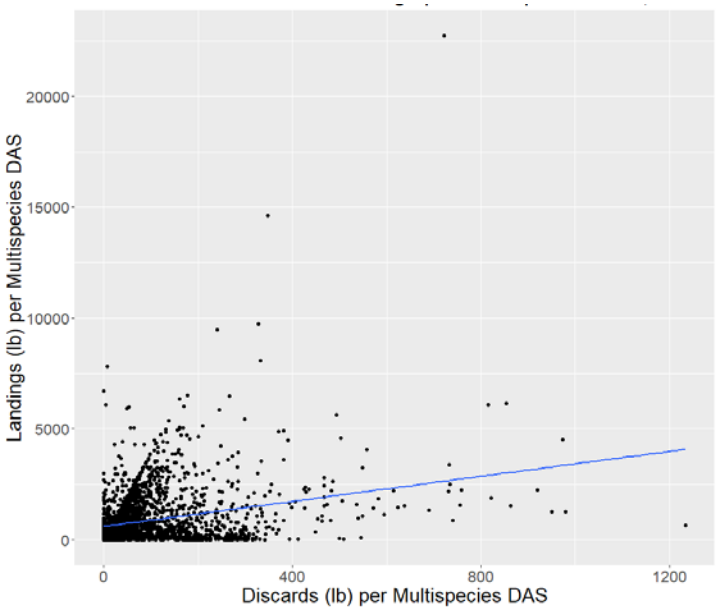
When on a NE Multispecies DAS, vessels discarded about 80 to 129 lb (whole weight) per NE Multispecies DAS used, depending on whether a D or C permit category was used, respectively (Figure 24). The amount of discarding appears to increase as landings increase (Figure 25).

Figure 24. Frequency of trip discards per NE Multispecies DAS, by permit category, FY 2021.



Notes: RSA trips were removed.
Source: CAMS and discard modules, November 2022.

Figure 25. Discards as a function of landings (lb, whole weight), per NE Multispecies DAS in FY 2021.



Notes: RSA trips were removed. Blue line indicates a trend line.
Source: CAMS and discard modules, November 2022.

5.5.5 Fishing Communities

Consideration of the social and economic impacts on fishing communities of proposed fishery regulations is required by the National Environmental Policy Act of 1969, as Amended (NEPA 1969) and the Magnuson-Stevens Fishery Conservation and Management Act, particularly National Standard 8 (MSA 2007) which defines a "fishing community" as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. § 1802(17)). Here, "fishing communities" include communities with a substantial involvement in or dependence on the monkfish fishery.

5.5.5.1 Monkfish Fishing Communities Identified

Primary and secondary monkfish fishing ports are identified for the Monkfish FMP. Based on the criteria below, there are six primary ports in the fishery (Table 28). Of these, the highest revenue ports are New Bedford, Gloucester, and Boston, MA (Table 29). There are 14 secondary ports. The primary and secondary ports comprised 66% and 28% of total fishery revenue, respectively, during 2010-2019. There are 138 other ports that have had more minor participation (6%) in the fishery recently. More community information is available from the NEFSC Social Sciences Branch website and in Clay et al. (2007).

Primary Port Criteria. The monkfish fishery primary ports are those that are substantially engaged in the fishery. The primary ports meet at least one of the following criteria:

1. At least $1M average annual revenue of monkfish during 2010-2019, or
2. Ranking of very high (factor score ≥ 5)[2] for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries Community Social Vulnerability Indicators (Table 28).

Secondary Port Criteria. The monkfish fishery secondary ports are involved to a lesser extent. The secondary ports meet at least one of the following criteria:

- At least $100,000 average annual revenue of monkfish, 2010-2019, or
- A ranking of high (factor score 1-4.99) for engagement in the monkfish fishery on average in 2016-2020, using the NOAA Fisheries Community Social Vulnerability Indicators (Table 29).

Table 26. Primary and secondary ports in the monkfish fishery.

State	Port	Average revenue 2010-2019		Monkfish Engagement, 2016-2020		Primary/ Secondary
		>$100K	>$1M	High	Very High	
ME	Portland	√		√		Secondary
NH	Portsmouth	√		√		Secondary
MA	Gloucester		√		√	Primary
	Boston		√		√	Primary
	Scituate	√		√		Secondary
	Chatham	√		√		Secondary
	Harwichport	√		√		Secondary
	New Bedford		√		√	Primary
	Westport	√		√		Secondary
RI	Little Compton	√		√		Secondary
	Newport	√		√		Secondary
	Narragansett/Point Judith		√		√	Primary
CT	New London	√		√		Secondary
NY	Montauk	√			√	Primary
	Hampton Bays/ Shinnecock	√		√		Secondary
NJ	Point Pleasant	√		√		Secondary
	Barnegat Light/Long Beach		√	√		Primary
	Cape May			√		Secondary
VA	Chincoteague	√				Secondary
	Newport News			√		Secondary

Table 27. Fishing revenue (unadjusted for inflation) and vessels in top Monkfish ports by revenue, calendar years 2010 – 2019.

Port	Average revenue, 2010-2019			Total active monkfish vessels, 2010-2019
	All fisheries	Monkfish only	% Monkfish	
New Bedford, MA	$368,627,420	$4,240,639	1%	**479**
Gloucester, MA	$48,514,248	$2,924,748	6%	**190**
Boston, MA	$15,999,540	$1,809,192	11%	**44**
Pt. Judith, RI	$47,753,305	$1,604,760	3%	**214**
Long Beach, NJ	$26,124,402	$1,459,529	6%	**74**
Chatham, MA	$11,764,003	$817,736	7%	**57**
Little Compton, RI	$2,398,385	$802,384	33%	**31**
Montauk, NY	$17,192,554	$726,690	4%	**116**
Hampton Bay, NY	$5,746,477	$578,235	10%	**64**
Portland, ME	$24,798,943	$559,798	2%	**71**
Other (n=146)	$368,846,866	$3,750,338	1%	
Total	**$937,766,141**	**$19,274,049**	**2%**	

Source: NMFS Commercial Fisheries Database (AA data), accessed April 2022.
Note: "Active" defined as landing > 1 lb of monkfish.

The Engagement Index can be used to determine trends in a fishery over time. Those ports with very high monkfish engagement in 2016-2020, generally had very high engagement in 2006-2010 and 2011-2015, except for Boston, MA, which had increasing engagement over this time (Table 30). There are 14 ports that have had high or very high engagement during all three periods, indicating a stable presence in those communities. Annual data on port engagement is available at the Commercial Fishing Performance Measures website.

Table 28. Changes in monkfish fishery engagement over time for all ports with high engagement during at least one year, 2006 – 2020.

State	Community	Engagement Index			
		2006-2010	2011-2015	2016-2020	2020 only
ME	Portland	High	High	High	High
NH	Portsmouth	High	Med.-High	High	High
MA	Gloucester	Very High	Very High	Very High	Very High
	Boston	High	High	Very High	Very High
	Scituate	High	High	High	High
	Chatham	High	High	High	High
	Harwichport	Medium	Medium	High	High
	New Bedford	Very High	Very High	Very High	Very High
	Westport	Med.-High	High	High	Med.-High
RI	Tiverton	Med.-High	Medium	Medium	Medium
	Little Compton	High	High	High	High
	Newport	High	High	High	High
	Narragansett/Pt. Judith	Very High	Very High	Very High	Very High
CT	Stonington	Med.-High	Med.-High	Med.-High	High
	New London	Med.-High	High	High	High
NY	Montauk	Very High	Very High	Very High	High
	Hampton Bays/Shinnecock	High	High	High	High
NJ	Point Pleasant	High	High	High	High
	Barnegat Light/Long Beach	Very High	Very High	High	High
	Cape May	High	High	High	High
MD	Ocean City	High	High	Med.-High	Med.-High
VA	Chincoteague	High	High	Medium	Medium
	Newport News	Med.-High	High	High	High
NC	Wanchese	High	Med.-High	Med.-High	Med.-High
	Beaufort	Medium	Med.-High	Med.-High	Medium

Source: http://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index.

Landings by state

During CY 2012-2021, monkfish were landed in 11 states, mostly in Massachusetts (61%), followed by Rhode Island (13%), and New Jersey (9%, Table 31). Massachusetts continues to account for the greatest proportion of all monkfish landings.

Table 29. Monkfish landings by state, CY 2012 – 2021.

STATE	Monkfish landings (mt)											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	
ME	488	115	257	345	243	178	219	170	411	442	**4,062**	4%
NH	57	86	74	38	50	68	123	119	175	213	**1,463**	2%
MA	5,247	3,812	4,972	4,303	4,227	4,581	5,067	5,943	6,306	6,057	**55,961**	61%
RI	1,303	1,598	2,122	1,495	1,488	1,819	1,648	1,560	1,412	2,306	**11,441**	13%
CT	347	305	457	547	724	380	464	275	246	324	**2,123**	2%
NY	841	766	1,059	1,183	773	748	827	1,193	829	1,005	**5,996**	7%
NJ	1,003	1,418	1,676	1,389	1,351	1,740	1,250	1,335	1,229	1,205	**7,946**	9%
DE	0										**0**	0%
MD	51	83	98	69	86	78	36	51	32	19	**285**	0%
VA	412	402	638	567	413	352	259	218	88	142	**1,748**	2%
NC	10	27	10	3	38	47	56	33	36	20	**244**	0%
Total	**9,758**	**8,612**	**11,365**	**9,940**	**9,394**	**9,992**	**9,949**	**10,897**	**10,765**	**11,735**	**91,271**	**100%**

Source: ACCSP database, accessed April 2022.

5.5.5.2 Social and Gentrification Pressure Vulnerabilities

The NOAA Fisheries Community Social Indicators (see also Jepson & Colburn 2013) are quantitative measures that describe different facets of social and economic well-being that can shape either an individual's or community's ability to adapt to change. The indicators represent different facets of the concepts of social and gentrification pressure vulnerability to provide context for understanding the vulnerabilities of coastal communities engaged in and/or reliant on commercial fishing activities. Provided here are these indicators for the primary and secondary monkfish ports (Table 32).

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

Most monkfish port communities exhibited medium-high to high vulnerability in at least one of the five social vulnerability indicators. Across all monkfish ports, the highest indicator of vulnerability is labor force structure.

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

Almost all monkfish ports scored medium-high to high in at least one of the three gentrification pressure indicators. This suggests that shoreside fishing infrastructure and fishing family homes may face rising property values (and taxes) from an influx of second homes and businesses catering to those new residents, which may displace the working waterfront. Across all monkfish ports, the highest indicator of vulnerability is housing disruption.

Combined Social and Gentrification Pressure Vulnerabilities. Overall, 11 of the 20 communities have medium to high levels of vulnerability for four or more of the eight indicators (combined social and gentrification pressure). This indicates high social and gentrification pressure vulnerability overall for both the primary and secondary communities. New Bedford, MA has six indicators at the medium to high level.

Table 30. Social vulnerability and gentrification pressure in monkfish ports, 2019.

State	Community	Social vulnerability					Gentrification pressure		
				Environmental Justice indicators					
		Labor Force Structure	Housing Characteristics	Personal Disruption	Poverty	Population Composition	Housing Disruption	Retiree Migration	Urban Sprawl
ME	Portland (s)	Low	Medium	Low	Medium	Low	Medium	Low	Medium
NH	Portsmouth (s)	Low	Low	Low	Low	Low	Med-High	Low	Medium
MA	Gloucester (p)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Boston (p)	Low	Low	Medium	Med-High	Med-High	High	Low	High
	Scituate (s)	Low	Low	Low	Low	Low	Med-High	Low	Med-High
	Chatham (s)	High	n/a	Low	Low	Low	High	High	Low
	Harwichport (s)	High	Low	Low	Low	Low	Med-High	High	Low
	New Bedford (p)	Low	Med-High	Med-High	High	Med-High	Medium	Low	Med-High
	Westport (s)	Medium	Medium	Low	Low	Low	Medium	Medium	Medium
RI	Little Compton (s)	Medium	Low	Low	Low	Low	Med-High	Med-High	Medium
	Newport (s)	Low	Low	Low	Medium	Low	High	Low	Medium
	Narragansett/Pt. Judith (p)	Medium	Low	Low	Low	Low	Med-High	Medium	Low
CT	New London (s)	Low	Med-High	High	High	Med-High	Low	Low	Low
NY	Montauk (p)	Med-High	Low	Low	Low	Low	High	High	Med-High
	Hampton Bays/Shinnecock (s)	Low	Low	Low	Low	Med-High	High	Low	Medium
NJ	Point Pleasant (s)	Low	Low	Low	Low	Low	Medium	Low	Medium
	Barnegat Light/Long Beach (p)	High	n/a	Low	Low	Low	High	High	Medium
	Cape May (s)	Med-High	Medium	Low	Low	Low	High	Med-High	Low
VA	Chincoteague (s)	High	Med-High	Medium	Low	Low	Medium	Med-High	Low
	Newport News (s)	Low	Medium	Medium	Medium	Med-High	Low	Low	Low

Source: NOAA Fisheries Community Social Indicators.

*n/a indicates ranking is not available due to incomplete data. (p) = herring primary port. (s) = herring secondary port

SPINY DOGFISH FOCUS

Note: Based on fishery differences and public input over the years from affected communities, the two Councils take slightly different approaches in describing the interaction of a fishery and the relevant human communities, so Section 5.6 (monkfish focus) and 5.7 (spiny dogfish focus) differ in formatting.

5.5.6 Purpose

This section describes the performance of the spiny dogfish fishery to allow the reader to understand its socio-economic importance. Also see NMFS' communities page at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/socioeconomics/socioeconomic-cultural-and-policy-research-northeast.

The most obvious way that human communities are affected by the fishery is from the revenues generated, and the jobs created. The affected communities include both individuals directly involved in harvesting and processing as well as indirect support services (e.g. vessel maintenance, insurance, ice, etc.). While the direct data points that are most available are landings and revenues, it is important to keep in mind that by contributing to the overall functioning of and employment in coastal communities, the fishery has indirect social impacts as well. Social impacts are strongly aligned with changes to fishing opportunities and while difficult to measure can include impacts to families from income changes/volatility, safety-at-sea (related to changes in fishery operations due to regulation changes), job satisfaction, and/or frustration by individuals due to management's impacts (especially if they perceive management actions to be unreasonable or ill-informed).

5.5.7 Recent Fishery Performance

This section establishes a descriptive baseline for the fishery with which to compare actual and predicted future socio-economic changes that result from management actions. The 2023 spiny dogfish Fishery Information Document and 2023 Spiny Dogfish Fishery Performance Report have details on recent commercial fishing activity, summarized below. These are available at https://www.mafmc.org/dogfish. There is negligible directed recreational effort/catch.

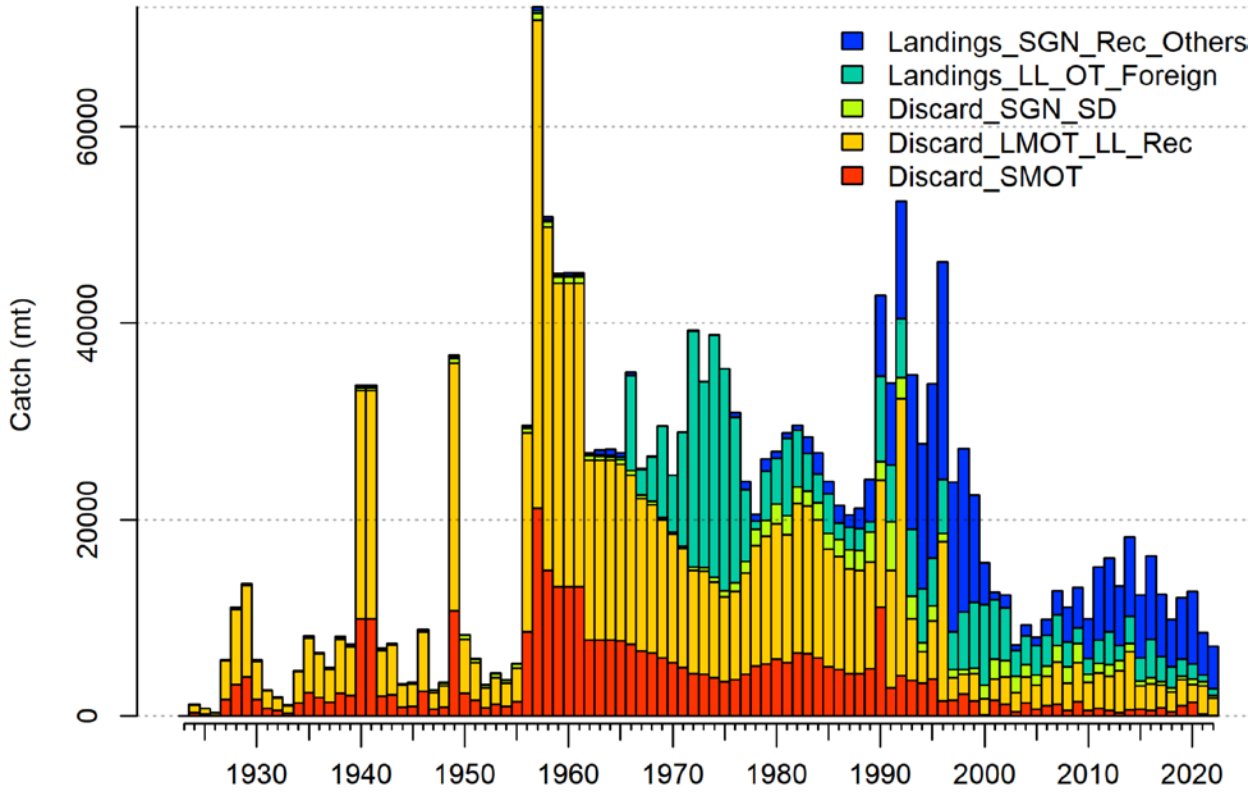
The NEFMC and MAFMC jointly manage spiny dogfish in federal waters (MAFMC has lead) and the ASMFC has a complementary state waters plan. Directed fishing was curtailed in 2000 when federal management began after overfishing in the 1990s led to an overfished finding. Examining vessels possessing any federal permit and landings of at least 10,000 pounds of spiny dogfish, during the initial rebuilding from 2001-2005, 29-68 vessels participated in the spin dogfish fishery. As abundance increased and fishing measures were liberalized, participation increased to a peak of 282 vessels in 2012. Participation has been declining since 2012, and 80 such vessels participated in the 2022 fishing year.

Figure 26 below, from the 2023 Assessment, describes spiny dogfish catch 1924-2022 and highlights the 1970s foreign fishery (teal color) and then domestication of the fishery in the 1990s (royal blue). Figure 27 to Figure 29 describe recent domestic landings, nominal ex-vessel revenues, and prices (inflation adjusted). Data since 1996 is more reliable than previous data due to improvements in reporting requirements. The Gross Domestic Product Implicit Price Deflator was used to report ex-vessel prices as "2022 dollars." Figure 30 illustrates preliminary weekly 2022 (yellow-orange) and 2023 (blue) landings through the year. Figure 31 displays locations of 2010-2021 NEFSC survey catches and VTR landings.

Recently most landings were in MA, VA, and NJ (Table 33). The fishery occurs throughout the year but is more focused north in the summer and south in the winter (Table 34). Most landings are made with

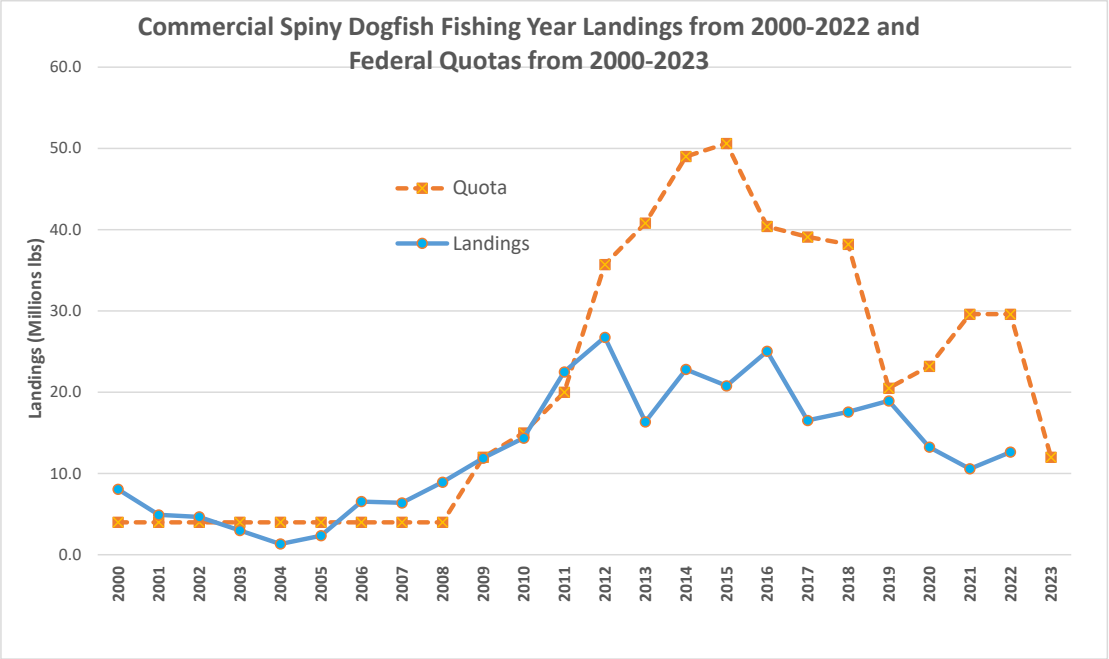
gillnet gear (Table 35). There has been a recent decline in the number of federally-permitted vessels participating (Table 36). Individual port data are not provided as it may violate the spirit of data confidentiality provisions even if not the letter of the law (an astute observer could potentially glean confidential data even if not obvious to some readers).

Figure 26. Spiny Dogfish Catches 1924-2022.



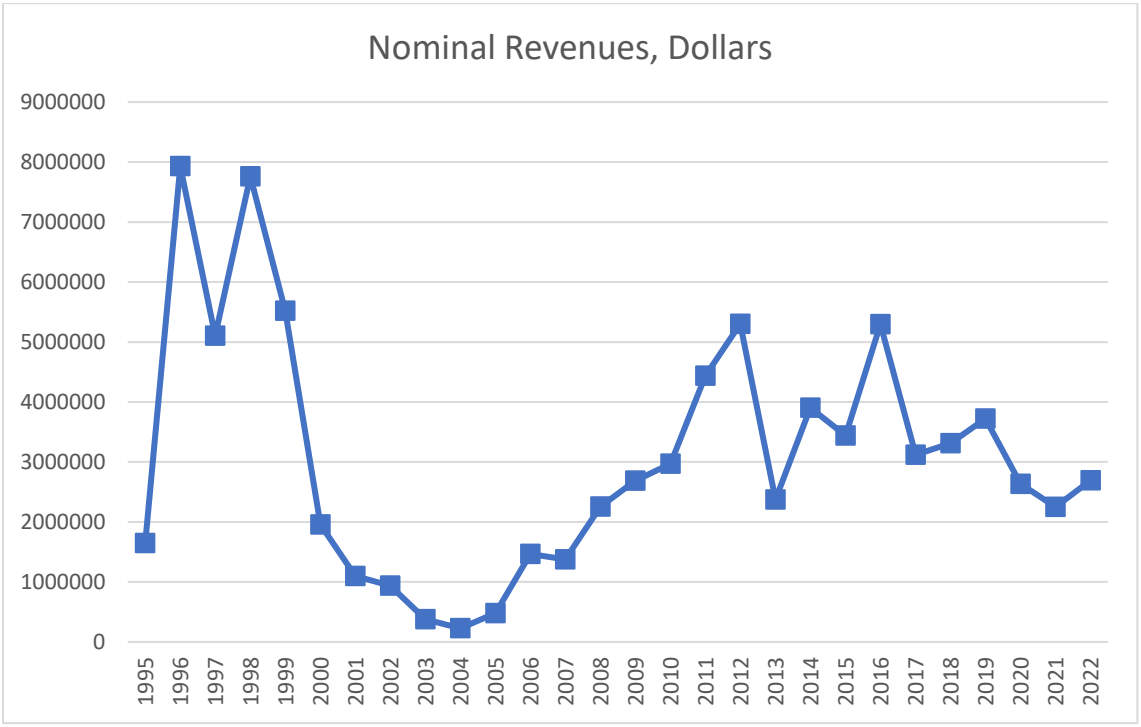
Source: 2023 Spiny Dogfish Management Track Assessment, available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php.

Figure 27. U.S. Spiny Dogfish Landings and Quotas 2000-2023 fishing years.



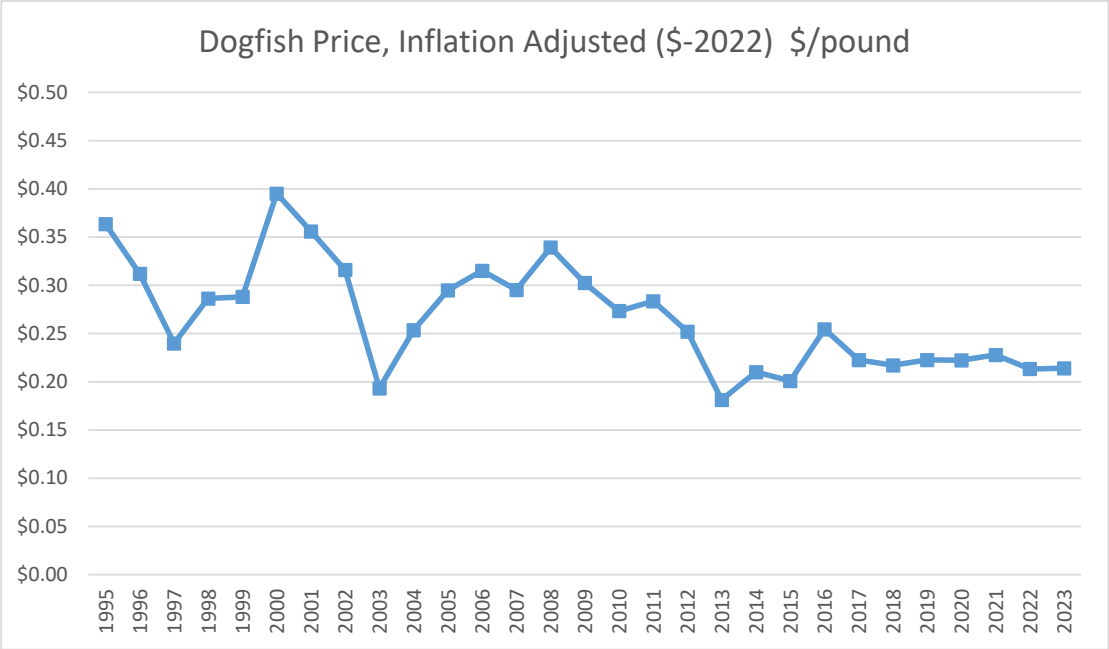
Source: NMFS unpublished dealer data.

Figure 28. Spiny Dogfish Ex-Vessel Revenues 1995-2022 fishing years, Nominal Dollars.



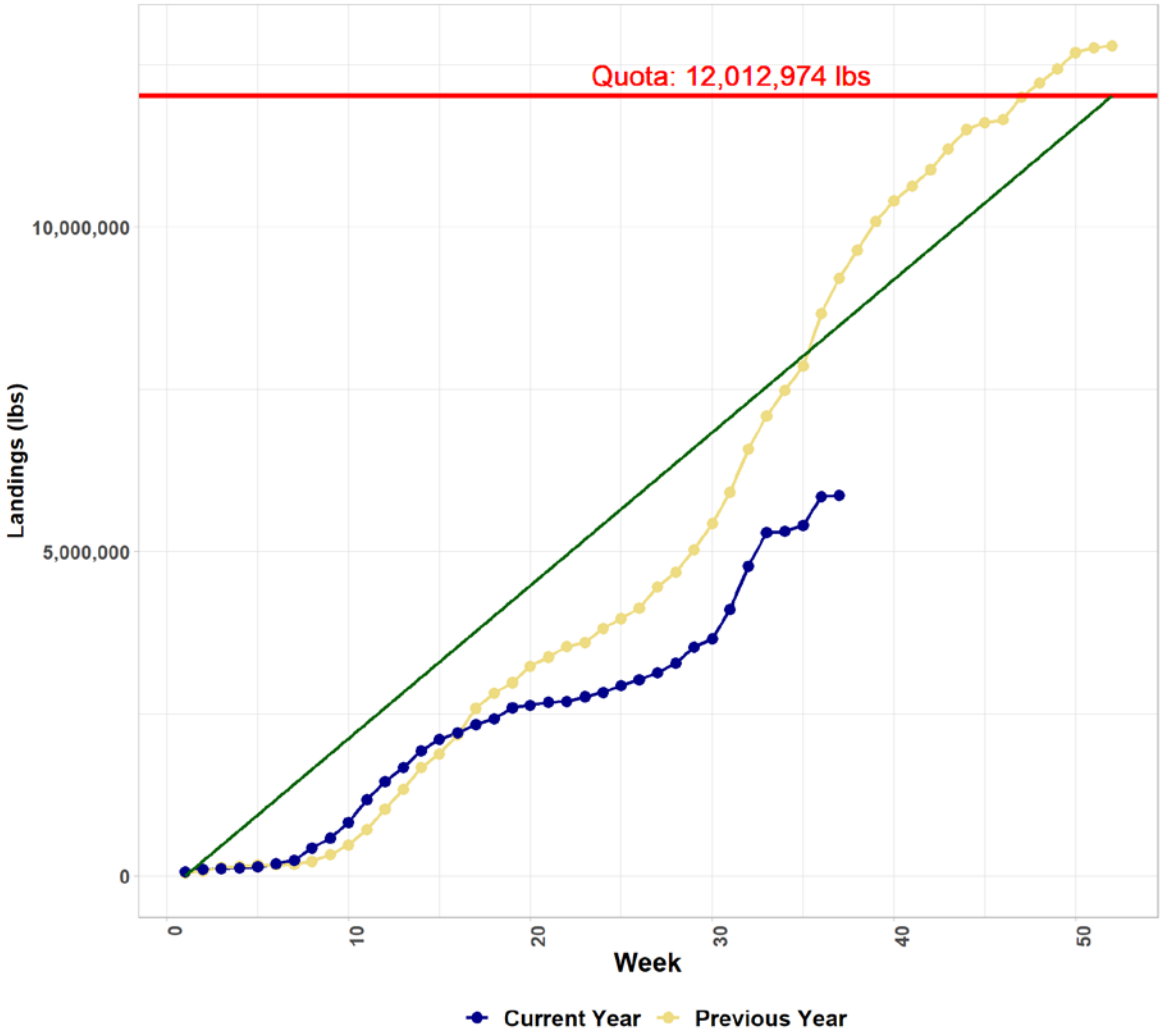
Source: Unpublished NMFS landings data.

Figure 29. Ex-Vessel Spiny Dogfish Prices 1995-2022 Adjusted to 2022 Dollars.



Source: NMFS unpublished dealer data.

Figure 30. U.S. Preliminary spiny dogfish landings; 2023 fishing year in dark blue, 2022 in yellow-orange.



Source: https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region. For data reported through 2024-01-17 Week 0 = May 1. 2023 fishing year quota noted (12.0 million pounds)

Figure 31. Survey and VTR Spiny Dogfish Catches 2010-2021 – Assessment – Jones 2022 Working Paper available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi.php.

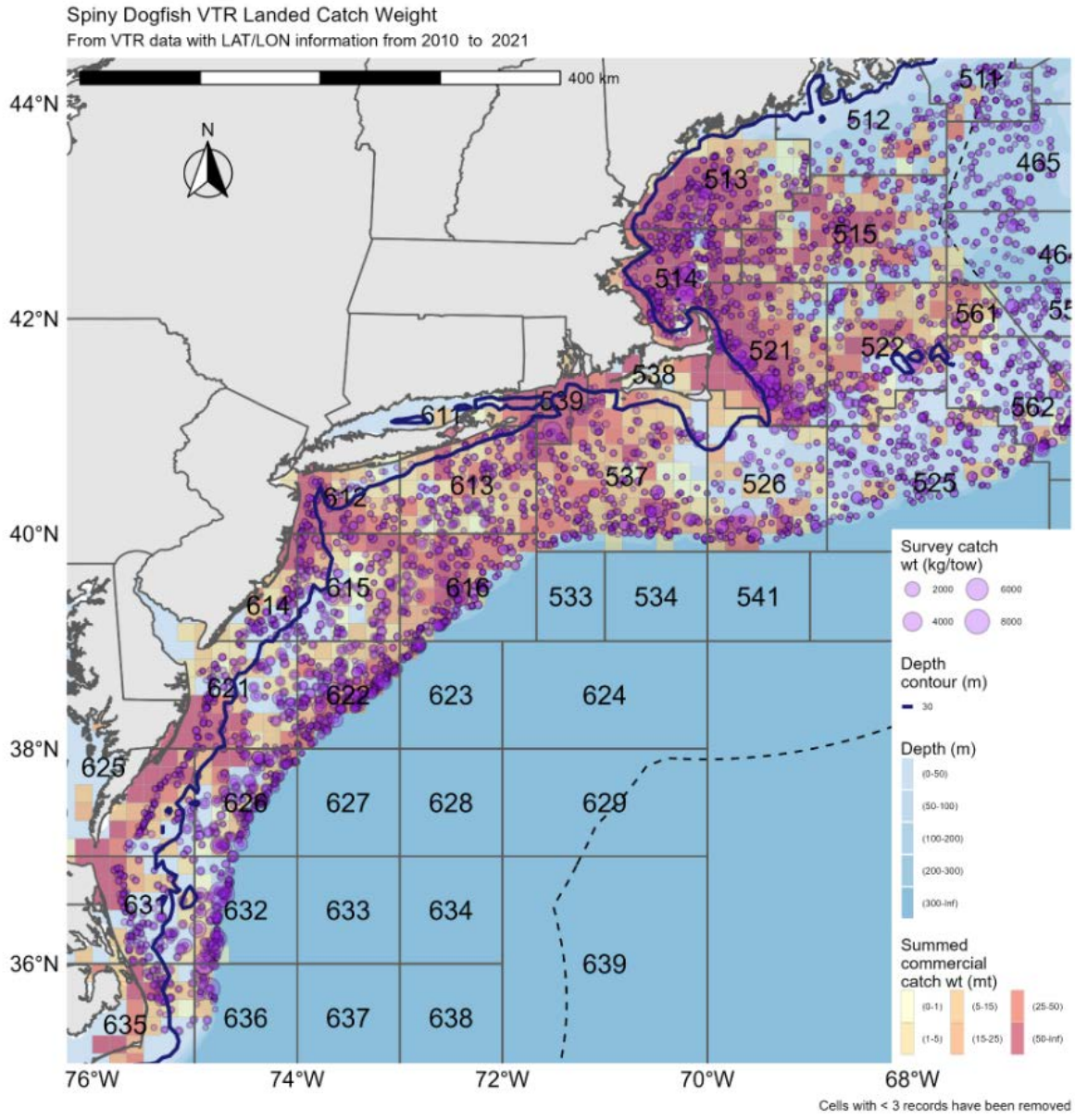


Table 31. Commercial Spiny Dogfish landings (live weight – millions of pounds) by state for 2020-2022 fishing years.

Year	MA	VA	NJ	Other (ME, NH, RI, CT, NY, MD, NC)	Total
2020	6.6	3.3	2.0	1.4	13.3
2021	3.8	4.0	1.6	1.2	10.6
2022	3.8	6.0	1.7	1.1	12.6

Source: NMFS unpublished dealer data.

Table 32. Commercial Spiny Dogfish landings (live weight – millions of pounds) by months for 2020-2022 fishing years.

Year	May-Aug	Sept-Dec	Jan-April	Total
2020	4.9	5.5	2.8	13.3
2021	2.9	4.6	3.1	10.6
2022	2.7	5.0	4.9	12.6

Source: NMFS unpublished dealer data. [2]

Table 33. Commercial Spiny Dogfish landings (live weight – millions of pounds) by gear for 2020-2022 fishing years.

Year	GILL_NET_SINK__OTHER	LONGLINE__BOTTOM	TRAWL_OTTER_BOTTOM_FISH	Unknown/Other	Total
2020	9.7	1.8	0.4	1.4	13.3
2021	9.2	0.5	0.3	0.6	10.6
2022	10.1	0.9	0.2	1.3	12.6

Source: NMFS unpublished dealer data. [2]

Table 34. Vessel participation over time in the Spiny Dogfish Fishery based on annual landings (pounds). Note: State-only vessels are not included.

YEAR	Vessels 200,000+	Vessels 100,000 - 199,999	Vessels 50,000 - 99,999	Vessels 10,000 - 49,999	Total with at least 10,000 pounds landings
2000	16	10	8	43	77
2001	4	12	10	33	59
2002	2	14	8	31	55
2003	4	5	3	17	29
2004	0	0	0	42	42
2005	0	0	1	67	68
2006	0	4	11	114	129
2007	1	2	21	72	96
2008	0	5	20	119	144
2009	0	11	42	166	219
2010	0	26	54	124	204
2011	1	48	73	135	257
2012	25	55	56	146	282
2013	10	27	45	87	169
2014	27	38	38	81	184
2015	31	33	36	59	159
2016	52	26	14	45	137
2017	28	27	24	32	111
2018	28	26	20	35	109
2019	29	25	21	29	104
2020	23	27	15	22	87
2021	15	27	11	26	79
2022	28	9	14	29	80

Source: NMFS unpublished dealer data.

Draft Proposed Plan for a Novel Industry Based Multispecies Bottom Trawl Survey on the Northeast U.S. Continental Shelf

January 18, 2024

Contributors: Northeast Trawl Advisory Panel, Northeast Fisheries Science Center Population Dynamics Branch, external reviewers

Point of Contact: Kathryn Ford, kathryn.ford@noaa.gov

Preferred Citation: Northeast Fisheries Science Center. 2024. Draft Proposed Plan for a Novel Industry Based Multispecies Bottom Trawl Survey on the Northeast US Continental Shelf.

1. Overview

Representative sampling of marine fisheries species in the Northeast region is crucial to conducting the stock assessments that inform fishery management advice and understanding changes in community composition. Many scientific surveys sample multiple fish species. These surveys strive to standardize vessels, gear, timing, and many other aspects of sampling to ensure comparable indices from year to year, which is statistically important for comparing population abundance estimates through time. The survey vessel is a major factor in catchability, so NOAA Fisheries' Northeast Fisheries Science Center (NEFSC) multispecies bottom trawl survey (BTS), a sixty-year-old fishery-independent survey, has relied on only two primary ships over its time series. The first ship, the Albatross IV, was used from 1963 to 2008. Due to ship retirement, a new vessel, the Henry B. Bigelow (hereafter Bigelow) started to be used in 2009 (both vessels are or were operated by the Office of Marine and Aviation Operations at NOAA). At the transition from the Albatross IV to the Bigelow, the survey gear was updated and an extensive calibration between the Albatross IV and the Bigelow was done (Miller et al. 2010). A sister ship to the Bigelow, the Pisces, can be used as a contingency vessel when the Bigelow is unavailable and was used in this capacity in the Fall of 2017. Similarly, the Delaware II was used to fill in for the Albatross IV several times and associated calibration studies were done. To improve resiliency in the BTS in the event the Bigelow and the Pisces are unavailable, as is foreseen as a possibility in the coming years, the NEFSC is exploring what a similar survey would look like using fishing-industry vessels. An industry-based multispecies bottom trawl survey (IBS) would create resiliency in survey activities in the Northeast region and could enhance fishermen's trust of the data informing stock assessments (Kaplan and McCay 2004, Johnson and van Densen 2007, Baker et al., 2023).

As a result of the loss of sea days experienced in the spring 2023 BTS and the accumulated loss of sea days since 2015, the New England Fishery Management Council (NEFMC) requested that the NEFSC provide an overview of survey status and steps being taken to maintain the quality and quantity of survey data used to support fishery management in the region. A presentation on

those topics was given at the September 2023 NEFMC meeting (Ford and Chase 2023). After the presentation and constructive discussion, the NEFMC passed the following motion:

> *The Council request the Northeast Fisheries Science Center (NEFSC) to develop a white paper to be submitted to the New England Fishery Management Council by January 12, 2024, outlining an industry-based survey that is complementary to the spring and autumn Bottom Trawl Survey*

This motion was then subsequently passed at the October 2023 Mid-Atlantic Fishery Management Council and supported at the October 2023 Atlantic States Marine Fisheries Commission meeting.

This document constitutes the requested white paper and is a component of the effort to consider at least four options for contingencies in the event the Bigelow is not available for the BTS, including 1) the Pisces, 2) an NEFSC operated vessel, 3) industry-based vessels calibrated to the Bigelow, and 4) a parallel industry-based survey. This white paper addresses option #4. The full contingency plan including all options is anticipated to be completed in FY2024.

Herein is described an industry-based multispecies bottom trawl survey (IBS) that would operate in parallel to the BTS. This plan for an IBS was developed in coordination with the Northeast Trawl Advisory Panel (NTAP), which includes commercial fishing, fisheries science, and fishery management professionals in the Northeast. An NTAP working group, through virtual meetings, individual phone calls, and comments and edits to two drafts of this white paper, provided feedback to ensure the feasibility and maximize the value of the IBS as a contingency to the BTS. The second draft of this white paper was provided for review to all NTAP members, NEFSC assessment and survey staff, and five external reviewers. While there was not complete agreement on all details of the IBS scope and design, this document represents a starting point tofurther develop an IBS.

If implemented, the IBS would develop its own unique time series that could be used to generate indices of abundance and other data useful to stock assessments, fishery management, ecosystem status, and scientific studies. When the BTS is conducting regular survey operations on the Bigelow, the IBS would be a parallel survey and would increase the number of stations sampled in a given stratum. When the BTS is not conducting regular survey operations on the Bigelow and cannot operate under other contingency options, the IBS would be the only shelf-wide fishery independent bottom trawl survey in the Northeast region of the U.S.

2. Survey Design Elements

This section describes the key design elements for a potential industry-based, multispecies groundfish trawl survey generating abundance indices for stock assessments and fisheries research in the Northeast region of the U.S. It is referred to as “The IBS” throughout this document. The IBS would use the same key design elements as the NEFSC multispecies

groundfish trawl survey conducted on the Bigelow, referred to throughout this document as "The BTS." The IBS survey operations would be the same or similar to the BTS survey operations to the extent possible to maximize comparability between the surveys. The BTS survey operations, including design, survey operations, data collection, and pre- and post- cruise activities, are described in detail in Politis et al. (2014). The design as proposed here is intended to serve as a framework that can be modified based on further discussion with potential vessels and pilot testing. The key differences between the two surveys are described in the section "Key differences between the IBS and the BTS." This section assumes funding would be found for all elements since existing programs would continue and could not be responsible for staffing or equipment. The overall cost of the program to support the IBS would be determined with further scoping.

2.1 Program management

The IBS would be a federally funded survey conducted by a third party akin to the NEAMAP Southern New England/Mid-Atlantic Nearshore Trawl Survey and the NEAMAP Maine-New Hampshire Inshore Trawl Survey. Field sampling survey crews would include the vessel crew for vessel and fishing operations and the science crew for fish sample processing. Other support elements such as data management and gear storage and inspection would be conducted in addition to field sampling. The NEFSC would provide a program liaison and support for survey staging and data transfer. There are other program management options described in the Elements of Decision-making section.

2.2 Sampling design

The IBS would be designed to follow as many of the BTS protocols as possible, i.e. a trawl survey with a stratified random design conducted in the spring and fall, ideally sampling over a 24-hour period, completing approximately 370 stations from North Carolina to Canada in each season, using the same strata and depths defined for the BTS (i.e. extending from Cape Lookout to Nova Scotia and covering depths from 10-200 fm (18-365 m); Figure 1). The IBS would allocate stations in each season following the same allocation procedures as the BTS, resulting in approximately 370 stations with the same station density and following other station allocation protocols as BTS (e.g., a minimum of three stations planned in each stratum, Politis et al., 2014). It is expected that the IBS would be able to sample in strata located in Canadian waters under existing intergovernmental agreements.

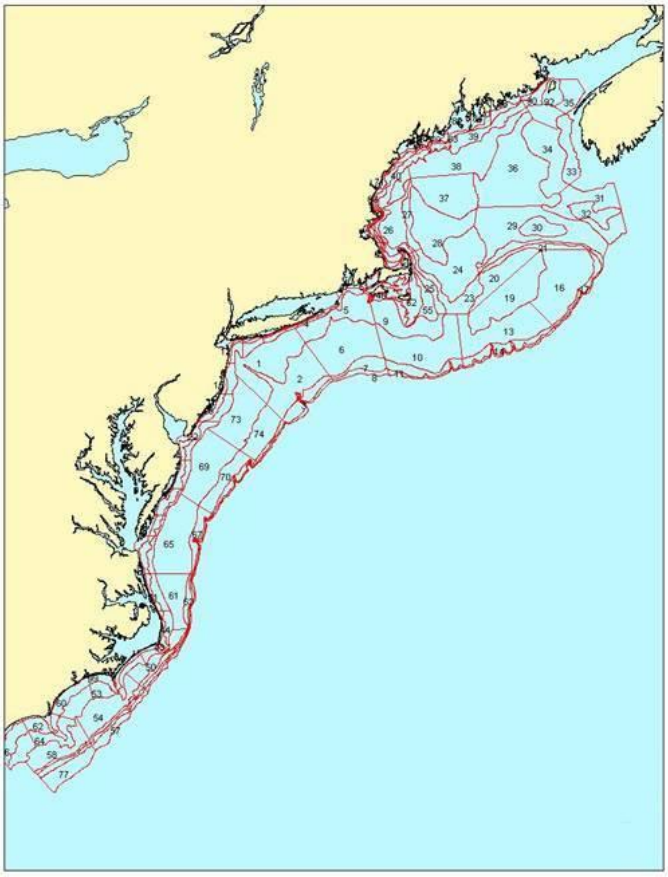


Figure 1.. The BTS survey strata.

The IBS would operate a fall survey between September and November and a spring survey from March to May. It would sample south to north timed to coincide with a typical BTS sampling season. A sampling day would be ideally 24 hours. Consideration was given to dividing the day into two periods that sample equal times with dusk and dawn at the middle of the time period. For example, if dusk is at 6 pm and dawn is at 6 am, one boat can sample from noon to midnight and the second boat can sample from midnight to noon.

Depending on how a 12-hour survey day is implemented, it may lengthen the time needed for the survey or may impact catchability of certain species that exhibit diurnal, nocturnal, or crepuscular behavior. Differentiating vessel effects from time of day effects would need to be considered in more detailed design development (e.g., vessels periodically switching between half-days).

If multiple vessels would be required to conduct the IBS, the vessels would be as similar as possible in length, beam, draft, and fishing power. Field studies and analytical calibration methods (e.g., VAST) would be used to standardize vessel catches to generate a single time series as is done with the Northwest Fisheries Science Center's multi-vessel bottom trawl survey (Keller et al., 2017). Vessels would operate with a predefined amount of spatial and temporal overlap to improve accuracy of the standardization.

2.3 Sampling gear

The IBS would use the same net and sweep as the BTS in order to sample the same stocks and cover the same geographic range. The IBS would use a fully standardized gear package either on single or on multiple vessels and would also sample for oceanographic parameters. The primary gear components are as follows:

- 3-bridle, 4-seam survey bottom trawl rigged with a rockhopper sweep meeting the same specifications as the BTS net and sweep (Politis et al., 2014)
    - Using a chain sweep for the southern New England and Mid-Atlantic component of this survey was a major point of discussion. Using different gear types across the sampling domain represents a relatively substantial change to survey design that was deemed outside of the scope of this document.
    - The use of standard doors or vessel-specific doors would be assessed in a pilot survey. Using a restrictor rope has also been suggested.
- Full complement of hull-mounted net mensuration gear including headrope and wingspread sensors (would use the same system on all vessels)
    - Sensors not being hull-mounted would be considered.
- Conductivity, temperature, and depth (CTD) instrument with temperature, depth, salinity (conductivity), dissolved oxygen, pH, and chlorophyll *a* sensors
    - Other parameters (nutrients, turbidity or water sampling via Niskin bottles) could be added, as technology and resources allow.
- Sounding capability to scope for trawl obstructions and untrawable bottom prior to each tow (does not need to be the same system on all vessels)
- Sampling tables, calibrated scales, and measuring boards, along with other associated sampling equipment
- Electronic data collection system (such as a portable Fisheries Scientific Computer System (FSCS)) that enables efficient and accurate catch, effort, and biological data collection and integration with GPS, net mensuration, and depth sensors

2.4 Vessels

The IBS would require vessels that can tow the sampling gear at the correct speed, host a scientific crew, and have enough space for catch processing. The size of the scientific crew is relevant for determining overall survey logistics since the crew size affects the speed of catch processing. Therefore, the crew size influences how many vessels are needed to complete the survey in the given timeframe. The BTS sails with 15 scientific crew to sample 24-hours a day. Other similar fisheries surveys sail with scientific crews of approximately 5 scientists for 12-16 hour survey days which would equate to approximately 10 scientists for 24-hour survey days. The primary criteria for vessels used in the survey would include:

- Appropriate length and horsepower to sample in open ocean conditions and tow gear at 3 knots for 20 minutes.
    - Minimum endurance would be defined (for example, being able to work a minimum of 12-hour operations over a 10-day period).

- Sufficient winch capabilities for towing the standardized gear package across the survey area
    - All winches would have the same wire diameter and adequately maintained wire. It would be determined if wire would be provided by the vessels or by the program. (Note: BTS uses a 1” winch wire, but 7/8” is more common in the northeast fleet.)
    - Winch wire length would be sufficient for towing in 200 fm (365 m) of water (at least 700 fm (1280 m) of wire).
- Necessary deck space for processing stations and catch processing
- Capacity for CTD casts to 200 fm (365 m). Placement of the CTD on the trawl net would be considered.
- Appropriate vessel crew for the length of the sampling day for captaining the vessel, operating the gear, and assisting with catch processing (vessel crew would assist with catch processing if time allows); this would vary based on the length of the survey day and survey legs. 12-hour survey days will likely have a vessel crew size of about 5 and 24-hour survey days will likely have a vessel crew size about 10.
- Meal provisioning for all personnel
- Space for 1 spare net (2 or 3 may be needed if multi-week surveys legs are being done)
- Capable of using appropriate doors
- If 24-hour operations are being done, appropriate number of bunks for vessel and science crews

Other vessel criteria would be developed after further discussion with potential vessels including dry lab space needs, required bridge electronics, on-board communications, and core safety equipment.

2.5 Towing protocols

Towing protocols would be developed to define tow path and direction, shelf-edge strata sampling, and standardized trawling procedures (setting, haul back, and trawl on-deck post tow procedures). Survey tow evaluation and validation would take place immediately following a tow so that invalid tows can be repeated. These procedures for the BTS are described in Politis et al. (2014). The development of these protocols would benefit from a pilot survey period in which survey vessels conduct experimental tows to verify standardized, workable protocols.

2.6 Sampling

Sampling would include data related to station, oceanography, gear performance, catch data, and biological data. The minimum data collection enterprise is as follows:

- Station data would include location, date, time, depth, vessel speed over ground, heading, sea state and weather conditions
- A CTD with temperature, depth, salinity, dissolved oxygen, pH, and chlorophyll *a* sensors would be deployed before conducting the tow at each station
- Gear performance data would include winch data (e.g., wire out, tension) and net geometry (e.g., door spread, wing spread, headrope height)

- Catch data would include total number and biomass (kg) for each species caught at each station, and individual lengths and weights.
- Biological data would include age structures (e.g., otoliths), sex, maturity, and stomach contents (preserved for analysis in the lab). Biological sampling may need to be limited due to staffing or storage space; limitations would be assessed during a pilot survey.
- Sampling would rely on subsampling protocols as defined in the BTS protocols to ensure efficiency.

2.7 Data management

The IBS would use an electronic data collection and management system to ensure high data quality and rapid availability to stock assessments and other research. Data will be available for use in stock assessments no later than 4 weeks after the survey concludes. Data would be publicly available within six months of collection.

The IBS data elements and structures would be comparable to the data elements collected by the BTS. All data would be electronically stored in the NEFSC databases for use by stock assessment scientists at the NEFSC. The appropriate timeline for incorporation of IBS abundance data into assessment models would likely be 3-10 years and would be dependent on the research track process. Data would also be available for use in the fishery management process and scientific research.

3. Differences between the IBS and the BTS

The key differences between the IBS as described above and the BTS are as follows:

- Program management relies on a third party (not NEFSC)
- Potential use of multiple vessels
- Potential use of different doors
- Smaller wire diameter
- No autotrawls
- Some towing protocols may need to differ to reflect different operational realities
- Potentially less biological sampling of fishes (potentially less age, sex, or maturity; no or less stomach contents; no or fewer special sampling requests)
- Plankton sampling to be determined
- No acoustic sampling (no ADCP, no EK80)

4. Elements of Decision-making

This section addresses the key considerations that influenced the design of the IBS. This section describes how various design decisions were made in developing this plan when multiple design options were available.

4.1 Scientific value

It is important to weigh the scientific value of new survey and research efforts. Since this survey was designed as a contingency option for an existing survey, the scientific value of the IBS was qualitatively compared to the existing survey, the BTS. The relative scientific value is influenced by whether or not the BTS would continue on the Bigelow as it is done now.

If the BTS continues on the Bigelow: Having a second multispecies groundfish survey could have substantial positive scientific value. There could be added value to doubling the sampling density in the survey strata (at least for some stocks). Further, both surveys could serve as a contingency for the other; in a season where BTS is not completed, IBS would be completed and vice versa, thereby creating resiliency in data collection.

If the BTS does not continue on the Bigelow: The primary impact on scientific value to the multispecies time series if the BTS does not continue on the Bigelow is undoubtedly the potential loss or gaps in the time series. Minimizing the impact of the break in the time series would benefit from multiple years of overlap between the BTS on the Bigelow and the IBS survey. If the Bigelow is no longer available as a survey platform and other contingency options are unavailable, the IBS would be the primary source of essential population-level data for multiple stocks and would be of substantial scientific value. The main drawbacks to the scientific value of the IBS compared to the BTS would be 1) potentially less standardization if multiple vessels are used, which decreases data quality and 2) potentially less biological sampling.

1. The use of multiple vessels presents a challenge for standardization in sampling. Ideally, IBS sampling would be standardized across multiple participating vessels, retaining as many BTS methods as possible and finding ways forward for aspects of sampling that cannot easily be standardized across participating IBS vessels. This would constitute a loss of standardization, but not a complete lack of standardization. It is feasible to address vessel effects either through calibrations or through the use of analytical tools, but efficacy of these approaches would vary across species and stock assessments. The necessity for standardizing data from multiple survey vessels may likely result in greater uncertainty in some indices of abundance. If multiple vessels are used, they should be as similar as possible in size, operation, and gear handling, should operate in similar spatial and temporal sampling frames to maximize standardization, and should be calibrated within and potentially across survey years. If a single vessel is used, the lack of standardization is much less of a concern and the main priority would be establishing linkages (e.g., calibration through fieldwork or analytical methods) with the BTS to bridge the separate time series.
2. For the IBS, some oceanographic (plankton sampling) and biological (stomach contents) sampling may need to be constrained due to staffing and sample storage limitations. The minimum biological sampling protocols were defined to address fishing industry stakeholders' feedback that a simpler sampling protocol would mean a greater number of industry vessels would be capable of conducting the survey. However, it is feasible to sample stomach contents and plankton on industry vessels. Since a loss of these data streams would be detrimental to our ecosystem science assessments of food webs, energetics, trends and distributions of plankton (some of which are used in stock

assessments), the pilot survey period should determine how these sampling protocols would impact survey timing and the number of vessels needed to complete the sampling in a given timeframe.

Timing on usefulness of the data: Data streams from the IBS could be used immediately for scientific products that rely on oceanographic data (conductivity, temperature, depth) and certain biological data (lengths, ages, and length/age at maturity). For science products that rely on time series of abundance estimates, the IBS could be informative after approximately 3-10 years of consistent sampling and would be dependent on the specific stock assessment method used.

4.2 Building trust & relationships

It is possible, but not guaranteed, that the IBS could build trust between the fishing industry and the fisheries science and management process. Existing industry-based surveys in the northeast region have built the fishing industry's confidence in survey data supporting stock assessments (Latour et al., 2023; Kaplan and McCay 2004; Johnson and van Densen 2007; Baker 2023; McElroy et al., 2019). Increased trust has also been claimed in other regions that have used industry-based surveys, including in Alaska (Lyle Britt, pers. comm.), the U.S. West Coast (NMFS 2023), and the Dutch North Sea beam trawl survey (de Boois et al., 2021). Efforts to improve trust in the BTS specifically, however, have not yet been successful. Co-developing the BTS gear was viewed as positive with respect to the net design but negative with respect to the doors (Ford et al., 2023). Participation by fishermen on the BTS and recent industry-based catch efficiency studies and flume tank demonstrations conducted collaboratively with industry (Politis et al., 2019; Jones et al., 2021; Miller et al., 2023) were viewed positively by participants, but have not broadly improved public perceptions that the survey gear poorly functions. The popular Marine Resource Education Program, a fishermen-led weeklong course on fisheries management, includes units on fishery-independent surveys and how the BTS operates, but the conventional narrative remains that the BTS is flawed. Also, a third party industry-based survey using gear designed by fishermen to focus on cod did not improve trust in survey results when the third party industry-based surveys found the same trends as the BTS in research conducted in 2004-2006 and 2016-2018 (Dean et al., 2023). However, there is great value in expanding and deepening collaborative relationships to improve information on fisheries resources in the region. There have been significant successes building these relationships and trust in survey data through the NEAMAP Southern New England/Mid-Atlantic Nearshore Trawl Survey and the Maine-New Hampshire Inshore Trawl Survey (Latour et al., 2023) and the NEFSC Gulf of Maine Bottom Longline Survey (McElroy et al., 2019).

4.3 Funding & program management

Whether the IBS is federally funded or not and whether program management goes through a federal agency or not introduces different risks to the viability of the IBS. Globally, all long-term fisheries time series on the scale being discussed here have been government-funded programs with reasonable stability. In the U.S., the BTS has had funding for seasonal sampling every year for 60 years, but there are existing shortfalls in funding for other federally-funded fisheries survey programs. Other fisheries surveys funded by state governments or non-governmental

organizations using industry-based or research platforms have typically been shorter term, although several state-funded fisheries time series are notably long (e.g., Massachusetts' state trawl survey, Rhode Island's Narragansett Bay survey, New Jersey's Ocean Trawl Survey, and Virginia's Juvenile Fish and Blue Crab trawl survey).

Program management for the IBS would be complex and NEFSC would need to add staff dedicated to this effort. Due to the extent of the sampling season (six months a year) and the extent of the geographic range (North Carolina to Nova Scotia) there are many logistical and operational challenges. These challenges increase as the number of vessels being used increases.

There are five potential program management and funding models for the IBS:

1. NEFSC operated and NOAA Fisheries funded. This model is used for the NEFSC Clam Survey, the Gulf of Maine Bottom Longline Survey, and the industry-based trawl surveys on the west coast and in Alaska. In this model, a full survey team would be hired by the NEFSC. While feasible, this model has the potential to introduce competition with the BTS.
2. Third party operated and NOAA Fisheries funded. This model is used for the NEAMAP Southern New England/Mid-Atlantic Nearshore Trawl Survey and the NEAMAP Maine-New Hampshire Inshore Trawl Survey. Since this model has proven to be effective by NEAMAP, is conceptually straightforward, and is viewed positively by the Northeast Trawl Advisory Panel, it was used in the hypothetical IBS survey design. In this model, a liaison and staging and data management support personnel would be hired by the NEFSC but the bulk of the funding would be directed to the third party for vessel contracting, equipment purchasing, and all other operational aspects.
3. The research set aside model (RSA) is used for scallops and monkfish. The RSA model was originally used when the NEAMAP Southern New England/Mid-Atlantic Nearshore Trawl Survey was initiated. Because of the cost of a shelf-wide industry-based trawl survey and the linkage of the RSA model to market prices, it is unlikely that an RSA model is viable.
4. Third party operated and third party funded. This model is used for state trawl surveys in New Jersey, New York, and Rhode Island. This model is likely to include the least involvement of the NEFSC, though a NEFSC-hired program liaison and data management support personnel would be beneficial.
5. NEFSC operated and third party funded (or jointly funded). This model includes arrangements in which NEFSC is handling survey operations and one or more third parties are contributing either funds or in-kind support such as fuel.

If the program is managed by a federal agency, there is increased risk of survey platforms changing if they are contracted (as opposed to volunteering their services, as in some surveys) since the federal government requires competitive bidding for one-year contracts with a maximum of four option years. There is also increased risk of survey impacts due to government inflexibility around addressing emergency repairs and delayed appropriations (i.e. government shutdowns).

If the program is managed by a third party, it is possible that there would be fewer vessel

changes over the life of the survey (as has been the case with the NEAMAP Southern New England/Mid-Atlantic Nearshore Trawl Survey on the F/V Darana R). A third party would also likely have increased flexibility to continue work during government shutdowns and could have more flexibility to address repair needs if there is less dependence on government contracting. Any dependence on governmental data collection and management systems and support might impede work during government shutdowns, but resilience planning could lessen this impact.

Depending on the specific funding mechanism, a third party management model may require competitive bidding for one-year contracts with a maximum of four option years, which could introduce uncertainty and potential staffing and platform changes.

Cost estimates for the IBS have not yet been developed.

4.4 Personnel

A third party receiving funding to implement the survey would need to build a multi-person management team for year-round business, logistical, technical, equipment, and data management support and a field survey team.

The IBS would benefit from personnel support from the NEFSC. The scale of the NEFSC engagement would depend on the funding and management models that are in place. In a third party model, NEFSC personnel could support project management, on-site survey mobilization (especially if FSCS is being used) and technical support, long-term data management, and analysis to ensure high data quality and use in assessments.

4.5 Data management considerations

The preferred data management model is to have the IBS feeding data into NEFSC servers directly through the FSCS system (similar to the model NEFSC uses with the Massachusetts' state trawl survey). This option maximizes the speed that data are available to stock assessment scientists and increases the likelihood of data being used by NEFSC, and so was used in the hypothetical IBS design.

There are two other potential data management options:

1. A third party could use another data collection system and deliver the data to NEFSC through the data delivery mechanism being piloted by scallop RSA partners in 2023. This option introduces risks of limited data use due to lags in data availability, inaccessibility or uneven access to all data elements in the data model.
2. A third party could entirely manage the data itself and provide indices. This option introduces uncertainty with respect to accessibility, vulnerability, and long-term archiving that would need to be addressed in program development and any potential government contracting. A third party managing the data also increases the potential for

lack of transparency in the calculation of indices. This data management option is undesirable.

Data access has been a challenge for NEFSC with several third party surveys. In order to maximize the value of the data collection effort to inform stock and ecosystem assessments, any third party data management component should be defined in a data agreement with NEFSC that specifies the expectations around the provision of data.

4.6 Flexibility (short-term reactiveness)

There are situations in which the Bigelow is available for most, but not all, of a given survey. In such a case, a contingency option of a vessel that can "fill in" for those sea days could be explored. In this white paper, the IBS was not designed to be a solution to filling in the BTS by sampling stations that the Bigelow has not sampled in a given season since the IBS is not calibrated to the BTS. Presumably, this could be more thoroughly explored after the feasibility of intercalibration is better understood. The IBS could be managed in a way that if short-term reactiveness were necessary, communication channels with the BTS would be robust and enable both programs to respond to the stressor. "Filling in" options will be explored in the Contingency Plan under option #3. However, although the IBS is not "filling in" for the BTS, the IBS would be able to collect data to support assessments.

4.7 Long-term viability

The IBS would be a long-term survey attempting to maintain consistency in vessel platforms and gears. The greatest uncertainty in predicting long-term viability is funding. Long-term viability of funding largely depends on the willingness of the funding source to continue to fund the survey and the demonstrated value of the survey. The IBS would also need to attract and retain skilled staff, since highly trained captains and scientists increase the consistency and quality of the data collection.

4.8 Need for calibration

The intent of the IBS is to develop an independent time-series. The development of calibration factors is species-specific and gets increasingly complex with an increase in the number and type of vessels, habitats, gear types, and species being sampled. The IBS would produce a separate time series that could be utilized in stock assessment. The need and value in integrating the IBS and BTS using calibration or analytical modeling methods (such as spatio-temporal models (e.g., VAST) could be considered on a stock-specific basis (Thorson 2019).

4.9 Protected species concerns

The IBS would double the amount of scientific trawl sampling done in the region. There are limited interactions of the BTS with protected species, but the IBS would need to specifically assess the potential for protected species interactions, apply for the necessary permits, and appropriately manage protected species interactions.

5. Conclusions

The IBS would provide a new time series of species abundance, distribution, and biology. In the early years of the IBS, it would likely have less precise indices of abundance than the BTS does, and if 24-hour sampling proves infeasible or cost prohibitive there may be bias in the sampling of species with diel cycles. It is possible that the IBS will need to decrease the extent of biological sampling that is currently accomplished on the BTS, if the scientific crew size is limited. Other regions that rely on industry-based surveys for their primary time series of fisheries abundance have addressed the challenges noted above and have been successful in executing their surveys reliably for decades. Thus, it is expected that the IBS could provide data useful to assessing stock status in the northeast region.

The existing BTS is broadly supported throughout the region as a robust, capable, and well-managed program and is a crucial data input to the majority of stock assessments in the Northeast. Therefore, ensuring the availability and preparedness of the Bigelow (and when needed, the Pisces), is a priority. However, there are known weaknesses of the BTS, particularly on a stock-specific basis, that warrant consideration of short- and long-term surveys to address those weaknesses. The recommendations received during the development of this white paper were:

- Develop new or expanded data collections specific to assessment needs. Develop standalone industry-based surveys that are based on scientific needs identified for stock assessments. These types of surveys have shown great utility over time.
- Develop a survey that is broken into two regions in which different gear types are used: south of Cape Cod to North Carolina (Southern New England & Mid-Atlantic) and north of Cape Cod (Georges Bank and Gulf of Maine). Ecological production units (EPUs) (Gamble et. al. 2016) should also be used in the survey design. Identify which species' stock assessments would be adversely affected by this approach (e.g., migratory species).
- Redesign survey strata to address known stratification issues, align with the ecological production units (EPUs), and/or provide overlap with inshore strata.
- Quantify the value of nighttime sampling in the Southern New England/Mid-Atlantic region.
- Conduct additional catchability studies. In particular, compare 20- and 30-minute tow lengths in terms of the impact on catch and on survey logistics.
- Develop a standardized and reproducible method to integrate multispecies bottom trawl surveys into a single time series.
- Develop an industry-based survey that can operate in wind farm areas across the northeast region and start sampling prior to wind farm development.
- Examine what would be lost if the maximum depth for the IBS is 160 fm instead of 200 fm since 160 fm is a more typical maximum depth for the fishing industry in this region.
- Consideration should be given to developing a survey that combines survey sampling with commercial fishing activities.

- Biological sampling should not be restricted. Include plankton and acoustic sampling in a pilot study and if they are deemed infeasible, then reconsider their need. It is easier to cut back on sampling than to add sampling after the survey has started.
- Describe how the index of abundance informs assessments and the research track timeline to better elucidate the costs and benefits of adding survey effort.
- Define expectations for building trust up front (e.g., consistently maintaining the standardized protocol over 10 years, data being used in stock assessment).
- Platform inconsistencies would be the obvious explanation of trends that differ from the BTS, which could further decrease trust.

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Guidelines for the Ricks E Savage Award

Eligibility:

A person who has added value to the MAFMC process and management goals through significant scientific, legislative, enforcement or management activities is eligible.

Award

The award will be presented during the February meeting.

Selection Process

1. Written nominations will be solicited and received by the end of November each year by the Executive Committee.

2. Initially, nominations may only be made by Mid-Atlantic Council members.

3. The Executive Committee will select the recipient by consensus.

4. The recipient's identity will remain confidential if possible, until announced during the award presentation.

Other Award Rules

1. Candidates must be nominated each year: no nominations will carry over.

2. Recipients can be reimbursed for travel expenses to receive the award.

3. The recipient will receive a plaque. A permanent plaque will be placed in the Headquarters office in Dover with a list of all the recipients.

Past Recipients

2006 - Jim Ruhle
2007 - Jim Gilford
2008 - Phil Ruhle
2009 - Laurie Nolan
2010 - Dennis Spitsbergen
2011- John Boreman
2012 - Jack Travelstead
2013 – Red Munden
2014 – George Darcy
2015 – Pres Pate
2016 – Lee Anderson
2017 – Howard King
2018 – Rich Seagraves
2019 – Rob O'Reilly
2020 – Warren Elliott
2021 – Steve Heins
2022 – Mark Terceiro

James A. Ruhle Cooperative Research Award Guidelines

Purpose of the Award

The James A. Ruhle Cooperative Research Award was established by the Mid-Atlantic Fishery Management Council to recognize individuals or groups of individuals who have made outstanding contributions to fisheries science and management in the Mid-Atlantic region through their participation in cooperative research projects.[1] The award was established in memory of Captain James "Jimmy" Ruhle (1948-2023), a commercial fisherman, former Council member, and cooperative research pioneer.

Eligibility

- Nominees for this award must have participated in a research project that involves collaboration or cooperation among fishermen (commercial or recreational) and scientists.
- The award may be given to individuals or to groups of collaborators.
- Nominees should have demonstrated exceptional collaboration, dedication, and/or innovation in their research efforts. The award may also be given in recognition of cooperative research projects that have significantly contributed to the understanding or management of Mid-Atlantic fisheries.

Nomination and Selection Process

- The award is not an annual award and will be given only when the Executive Committee deems there to be a deserving recipient.
- Nominations can be made by any Council member or the Executive Director. SSC members and Council staff can suggest candidates for consideration through the Executive Director.
- Written nominations may be sent to the Executive Director at any time during the year. Nominations should include a description of the nominee's achievements, qualifications, and any relevant projects.
- The Executive Director will present nominations to the Executive Committee as they are received.
- The Executive Committee will discuss each nominee's qualifications and achievements relative to the criteria for this award and select the recipient by consensus.
- The award presentation will occur at an award ceremony in association with a Mid-Atlantic Council meeting. The recipient will receive an award trophy at the ceremony.
- Recipients will be reimbursed for travel expenses to receive the award.

[1] "Cooperative research" refers to the partnering of fishermen and scientists to collect fisheries information.